RSM ERASMUS UNIVERSITY

ROTTERDAM SCHOOL OF MANAGEMENT
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MASTER THESIS BUSINESS ADMINISTRATION
NEW BUSINESS, INNOVATION & ENTREPRENEURSHIP

Idea

Learn

Data

Measure

Product

Build
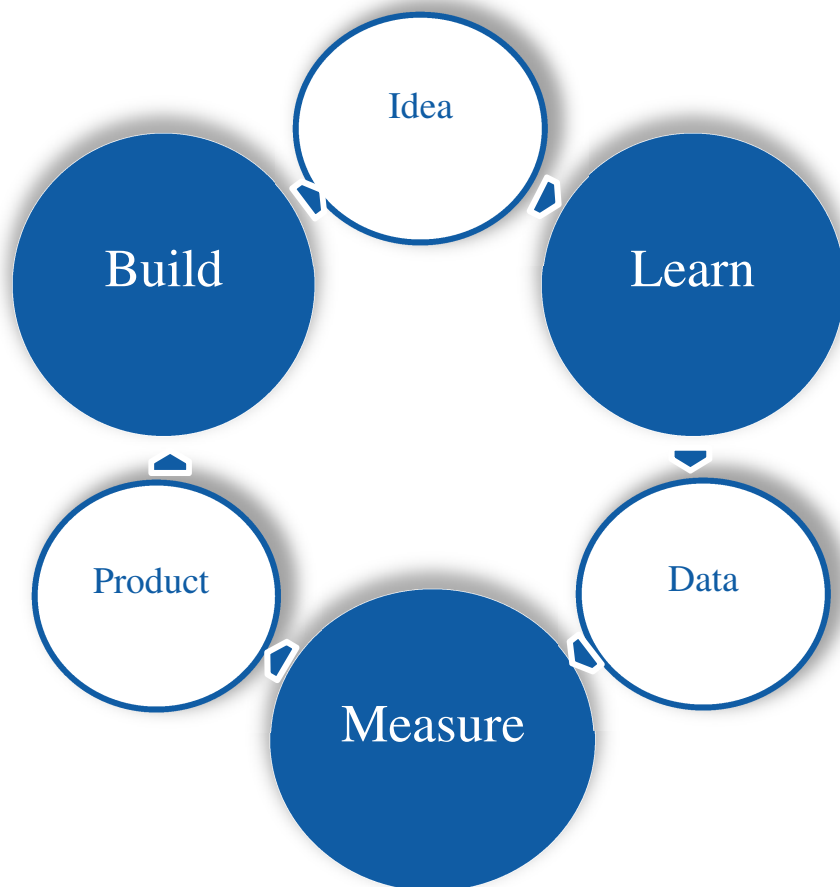
*"THE ONLY WAY TO WIN, IS
TO LEARN FASTER THAN
ANYONE ELSE "*

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Preface

Before you lies the master thesis ''***What is the effect of the Lean Startup Methodology on large companies' s innovation capabilities?''*** This Master's thesis is the evidence of my ability to deal with a research context and produce an independent piece of scientific work that yields the required results and has been produced according to valid scientific standards of the Part-time Master Business Administration program 2014-2016.

During this program at RSM it is essential that the students are capable of conducting research in the scientific field of the preferred master course, in my case the master course New Business, Innovation and Entrepreneurship. The students must be able to describe the integral research methods to generate a master thesis. From formulating a problem definition to retrieving and analysing empirical data, to draw conclusions and suggestions for future research. The aim of my master thesis is to learn new understandings, use an inductive approach to formulate unconfirmed hypothesis and acquiring extensive conclusions.

My research was carefully prepared in The Netherlands and conducted between the 2nd of January and the 26th of July 2016. The research began as a curiosity in product development within Fintech start-ups, what automatically resulted in stepping in the world of the Lean Startup movement by Eric Ries. A successful startup can be achieved by learning the concepts of this methodology, in an iterative way which has proven to be successful. So, my goal is to learn how the Lean Startup Methodology is enabling companies to boost their innovativeness in a way that leads to speed and creating new business opportunities.

In conclusion, the knowledge and experience I have gained over the past two years have given me new insights and experiences during lectures and assignments, creating new opportunities and friendships. Looking back, this was an intellectual journey that both were inspiring and unique, from Rotterdam to Shanghai.

This preface gives me the opportunity to specifically acknowledge a number of people. First my wife, the past two years, work and study were my priorities and she made a huge contribution serving as a shit umbrella and her support and patience made it possible to finish this program within two years.

I also like to sincerely thank the professional people that have made this research possible, my supervisors, for their excellent guidance and support during this process; Ferdinand Jaspers for guiding me in how to setup my research, finding and structuring data and assisting me whenever necessary. Lonneke Roza for further refining my methodology and help me how to improve my interview protocol.

I also wish to thank all of the interviewees, the pleasant cooperation made this master thesis possible. To my colleagues at Rabobank and my classmates, I would like to thank them all for the wonderful cooperation as well and I also benefitted from debating issues with them. Special thanks for Lia Hof and Brenda Molendijk, the program managers, their support and kind words have served me well.

Zoetermeer, July 2016,

Vikash Sital

Management Summary

Eric Ries started and created The Lean Startup Methodology and the term Lean Startup has its origin from the IT industry. Lean Startup is used as a customer centred approach. What do customers want? This question causes uncertainties and a major uncertainty is the hazard of developing a product or service that customers don't want to use. Trying to minimize that hazard, Eric Ries' Lean Startup Methodology addressed a new way of founding and guiding startup creation. Rather than bringing a finalized version of a companies' product to the market, Lean Startup Methodology endorses the creation of an early version and its constant improvement through direct customer feedback.

The overall objective must be to improve the ability to successfully innovate, according to Ries. In general, companies who improve their innovation capability are able to achieve better value propositions and higher profits. So, Innovation capabilities as source of competitive advantage for organizations are therefore an important issue in the scientific literature. To develop an innovation capability, the right conditions have to be in place to fully benefit from the innovation outcomes.

My research facilitated the exploration of the Lean Startup Methodology as a phenomenon using a literature study, observations and interviews. This ensured that my research was conducted throughout different research methods to have a variety of scopes to integrally comprehend the concepts. The aim of my research is to explore which effect the implementation of the Lean Startup Methodology has on the innovation capability and thereby measure the influence of the innovation conditions.

The results of the research were that the Lean Startup Methodology enabled them to maximize the usage of resources by constantly prioritizing and use key metrics to define their definition of success within uncertain conditions. The companies have adopted the Lean Startup Methodology by creating a management vision, installing an innovation process, a methodology around the development of producing better products, customers want to use. All the companies conclude that the Lean Startup Methodology has maximized their amount of validated learning in their search of a product/market fit by developing MVP's, ultimately improving their innovation capability.

An important innovation condition is that managers can create and shape the organization's culture, by defining new means, minimize bureaucratic layers, strengthen collective understanding and accommodate resources. The companies have proven when one has an explorative culture, it will positively affect the innovation capability.

Even more, the Lean Startup introduces another way of innovating, embracing this innovation strategy means dedication from the management. In conclusion, the higher the decision making unit is positioned within a company, preferably top management , the more impact the Lean Startup Methodology has within an organization to make a cultural change.

The most learning will be achieved with failure. So, some companies praise the biggest failure. This engages people to learn and fail. The Lean Startup Methodology is therefore most suitable to test assumptions in an uncertain environment, with the result to learn faster than the competition and create value propositions to achieve an competitive advantage in commoditized industry.

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Abbreviations:

LSM: Lean Startup Methodology

MVP: Minimum Viable product

1.   Introduction and motivation

In 2007 many banks had good reputations and were associated with terms such as trustworthy and strong brand value. The global financial crisis of 2008 changed all that. Lots of banking brands still have to regain trust and credibility from the public caused by the financial crisis of 2008. Even years after the financial crisis banks still are overcoming the reputational damage. In conclusion, the perceived credibility in banks by the public is still low and their offerings are becoming more commoditized. This is all the more disturbing given the importance and relevance of the banking industry within the financial market and the society.

Banks are continuously questioned regarding their code of conduct and strengthening their brand value has become an obsession in order to regain trust from the society. So, banks are forced to find new ways to improve the customer journey. Many traditional banks have to make the important choice to continue their current business model and soon be disrupted, or find new business models to survive and hopefully appeal to the public's needs to regain their trust and improve their relevance.

According to the literature of the authors Chan Kim and Mauborgne (2015) the banking industry can be associated with their definition of red ocean companies. Distinctly, market players within a red ocean are constantly trying to gain more market share than their competitors, where the market becomes crowded, products become commodities and differentiation becomes low. Eventually, prices will drop and margins become thin. Heaving fighting is the only way to beat the competition, what makes the ocean red. In blue oceans, market players are exploring new ways to expand their business outside their existing market. This makes it possible to find new opportunities and become more successful.

Therefore ING explained, as a guest speaker during college, the necessary introduction of the Spotify model into their organization to overcome their ''Spotify Moment''. The "Spotify Moment" is the moment at which technology disrupts the traditional business of market players, like the way the music industry was disrupted by Spotify. ING believes that they must ''kill their cash cow'' and therefore need to disrupt their existing business model. However, from a personal experience, banks are constantly trying to improve their existing activities, instead of exploring new activities. So, how can such a mechanical, commoditized industry thrive in a world that becomes more disrupted and uncertain?

As from a scientific point of view Jansen et al (2006) motivate that focusing on executing the existing activities are insufficient to gain a sustainable competitive advantage. Companies in a dynamic environment can improve their achievements by developing new products and services, as well as creating new business models and demands. Therefore Van Hemert et al (2013) state that companies need to develop specific capabilities, innovation capabilities to fulfil their strategic goals.

In the article of Blank (2013) he concludes that the Lean Startup has changed the way companies innovate. The Lean Startup proofs that companies can outperform competitors and achieve a sustainable competitive advantage through their innovation capability. So, scientifically, it's most interesting to investigate how the Lean Startup is improving the innovation capabilities of companies, eventually to achieve a sustainable competitive advantage.

Now the question is how can they overcome their ''Spotify moment''? In my opinion they must start now to embrace **the Lean Startup Methodology** (hereafter called LSM). Banks need to change their business model and search for product/market fits in order to keep up with the ongoing technologies to survive the ''Spotify Moment''. Here above leads to my goal, which is to comprehend the LSM and how that it can enable the *innovation capabilities* of large companies in commoditized industries. Important is to investigate and determine what innovation *conditions* can help to adapt this innovation strategy.

2. Research Design

In this chapter I will describe the components of my research design. In which I will motivate my problem definition, my objective definition, research questions and report structure.

2.1 Introduction problem identification

LSM gained lots of attention over the years and Eric Ries, the author, describes a new way for companies to build new products and launch them successfully in the market. LSM encourage companies to learn what their customers want and constantly testing their vision (Ries, 2011). LSM is also known as a ''customer development'' method (Blank, 2013).

The overall idea behind LSM is that innovation is a process, a methodology. By adopting LSM, validated learning becomes crucial; that means that companies must validate their hypothesis by constantly engage feedback loops. To investigate in an early stage what customers want companies can reduce market risks and prevent failures and waste.

Here above leads to my goal, which is to comprehend LSM what can enable the innovation capabilities of large companies in commoditized industries and determine which innovation conditions are necessary to adapt this innovation strategy.

Conducting a research purely to fulfil the curriculum doesn't give me much satisfaction. So, I searched for a topic that would passionate me and could make a contribution to the scientific literature. During my search, I quickly came to the conclusion that there was little scientific literature available regarding LSM and the few articles I found, briefly described the methodology and the results.

Due the fact that LSM is exercised in practical terms, little scientific literature is available. In order to comprehend these concepts of LSM I had to retrieve empirical data. I belief that this gap in the scientific literature was my first motivation to investigate LSM. Also, I felt the urgency to connect LSM to other scientific topics. Researching this phenomenon would broaden my scope and enrich the scientific relevance of my research. From my point of view, it is important to investigate in a profound way how the best practices have implemented LSM. Most of all, what effects occurred during their implementation to be more agile in an uncertain industry.

Therefore, parallel to my problem definition and research questions, it is beneficial to determine if a large company has to behave and act as a startup. Startups can be found in each type of company, from profit companies to governments, from non-profits to NGO's. The methodology stays the same, it is an universal method. It is said that LSM is most beneficial when the environment has a certain level of uncertainty. When environments are predictable, LSM will lose its benefits. No hypotheses have to be validated and feedback loops with customers are not necessary.

Based on the aforementioned, LSM is of use when companies deal with uncertainty and I think it's an opportunity to research how LSM is implemented within large companies, banks, who have to shift and adopt other ways of innovating. This, to create new business models to stay profitable and offer products that customers want to overcome to be disrupted by fintech companies.

2.2 Problem definition

Large companies in commoditized industries need to seek new business models and determine which specific needs their customers have in order to survive and avoid their ''Spotify Moment''.

2.2.1. Problem definition and research questions

Based on my motivation in chapter 1, I have thoroughly determined my problem definition:
What is the effect of LSM on large companies's innovation capabilities?

My research questions are divided into two scopes, which will be answered throughout the literature review and the empirical findings:

Literature review:
- What is innovation?
- Which type of innovation is LSM?
- What are innovation capabilities (according to scientific research)?
- What are innovation conditions?
- What effects does the literature claim of the lean start up model on innovation capabilities?

Empirical findings:
- How do the innovation conditions affect the innovation capabilities?
- To which extent are the benefits realized within the companies applying LSM?
- To which extent are these benefits realized within the interviewed companies?
- What conclusion can we draw on the conditions for the application of the lean startup model for the innovation capabilities?
- How does the lean start up methodology enables innovation within large organizations?

2.2.2. Research objectives

My research objectives are to determine (1) how innovation capabilities can be improved by using LSM and (2) which innovation conditions are necessary for LSM to create a favourable climate, where LSM can be successfully implemented within large companies in a commoditized industry.

In order to meet my research objectives, I have determined a research strategy which consists of three steps:
1. First, the aim is to understand and describe conceptually and empirically, how and to what extent benefits can be realized throughout the LSM.
2. Second, investigate the concepts of the LSM and which benefits are realized within the innovation capabilities of a large organization and capture the components of the LSM in academic terms.
3. Third, I will concentrate on the moderating innovation conditions that are associated with such an innovation strategy and what favourable climate is beneficial for LSM.

2.2.3. Practical relevance

LSM initiatives amongst startups and large companies are emerging. However, despite increasing examples of companies successfully embracing the LSM, there is still much uncertainty for managers in large companies how to organize this methodology. In the book of Eric Ries he offers many examples and deconstructs them into the specific concepts of LSM. T

This research is relevant, because I want to deliver more insights how LSM has manifested within a corporate setting and which lessons are learned to provide tangible aspects and recommendations for further research and for managers more certainty adopting LSM, and for entrepreneurs, intrapreneurs and innovation enthusiasts how to enable LSM within their current activities to become more successful in innovating.

2.2.4. Academic relevance

Research on the literature for LSM does not yield many results through quality articles from publications and articles in scientific journals, Google Scholar and books. Even though LSM is an emerging popular phenomenon within startups and large companies, but LSM has not retrieved much consideration in academic magazines and scientific literature.

Ries (2011) claims that LSM creates an **competitive advantage** by learning quicker than competitors. ''Competitive advantage'' yields many results in scientific literature and is of great importance within the scientific fields of strategic management and innovation management. Within the last decade, Michael Porter can be seen as the founding father regarding ''competitive advantage'' throughout his value chain framework. Yam et al (2011), Zawislak et al (2012), Prajogo (2006) have studied competitive advantage throughout innovation. So, there are different ways for companies to achieve a competitive advantage, LSM provides a methodology where the ''speed of learning'' can lead to differentiation and exploring new business models.

The academic relevance of this research is to add knowledge to the literature of LSM, through empirical research. Importantly, this research provides a comprehensive framework within to provide new insights and (tangible) findings how LSM can accomplish a **competitive advantage** and which adjoining subjects will change directly and indirectly by LSM.

2.2.5. Structure of the research

In this master thesis I have used the following structure:

Chapter 2: In chapter two the research design that will be used as the basis for this research will be discussed. Also, I will discuss my problem definition, mention my research questions, research objectives and my contributions.

Chapter 3: Starts with a theoretical anticipation about innovation capabilities, innovations conditions and LSM. This literature overview serves as a basis and delivers an overview of the relevant literature within the mentioned subjects. This also creates the context for the results generated with this research.

Chapter 4: This chapter entails the conceptual framework and the formulated hypotheses.

Chapter 5: Here I detail the methodology of this research. Subsequently the executed research methodology is presented, inclusive way of data collection and discussion about research validity and reliability.

Chapter 6: The results of the qualitative interviews are presented in my confrontation matrix.

Chapter 7: Finally, chapter seven contains the analysis of the data and the answers to the hypotheses.

Chapter 8: In this chapter the implications of my research will be motivated, which limitations are in place and suggestions I propose for future research.

3. Literature review

This chapter entails a theoretical exploration in the available research literature. At first, I will define the concepts of innovation. Followed by explaining the concepts of innovation capabilities and innovation conditions. Furthermore, I will elaborate on the constructs of LSM. Then I will discuss the relevant linkages and conclusions between the different concepts which I found in the scientific literature. Finally, based on the expected relationship (s) between these concepts I will develop my conceptual model in chapter 4.

3.1 What is Innovation?

Eric Ries describes in his book that every company can be innovative by creating a methodology around the innovation process. So, to which extent does LSM helps companies to be innovative? And what is innovation? I will shed a light on these questions at the end of this chapter. The place for me to start now is with a definition of innovation.

There is still no decisive definition of innovation. Schumpeter (1934) defines innovation to be a market introduction of a technical either organizational novelty, only not its invention. Schumpeter made a fundamental point and he proposes that an innovation does not occur until some novelty (technical, organizational or otherwise) is launched into a market, adoption by the market is necessary. In his article he used a clear example of the large scale electric power distribution, which was promoted by Edison. According to Schumpeter that was an invention, but it was the use of the alternating current, promoted by Westinghouse, that gained widespread adoption. And therefore became an innovation!

Schilling (2005) proposes that people define ''technology'' with innovation. Her opinions is that people who are thinking that innovations are driven by technology should rethink their opinion. She claims that innovation is more than only technology. Being innovative does not mean inventing; Innovation enables companies to change their business model and to be more adaptable to changes in their environment by delivering better products and services.

Schilling (2005) motivates that the benefits of innovation for companies lay in creating and implementing new ideas where new products and enhanced services arise. Schilling claims that, consequently, innovating companies gaining more efficiency in their critical business processes and procedures, which are resulting in higher productivity and economic impact.

According to the authors Bayarçelik and Taşel (2012), they claim that innovation entails the introduction of a new or notably enhanced product, service, process, marketing method or organizational method within a business domain. Also, the spreading of innovations need to be done carefully and successfully in order to achieve an economic impact.

Innovation has to be an important component of a business strategy, a way that people create an innovative culture where innovative thinking and creative problem solving are anchored (Klewitz and Hansen, 2014).

So, my summary is, from the definitions from here above, that innovation is more than only a technical solutions or invention, these concepts need to be adopted to become an innovation. Innovation is an important component of a business strategy, where innovation can lead to develop new products and services. This will change the business model where value is created to achieve an economic impact.

3.2 Types of innovation

Now that I have a conclusive definition of innovation, I find it relevant to distinguish the different types of innovation. This will provide me an answer on my research question; which type of innovation is LSM, based on the scientific literature? Identifying these types will lead me to determine which innovation theory is appropriate for LSM and how it can be characterized.

The practical issue here is that innovations can be characterized in many ways. I found four different articles regarding innovation, from 1985 till 2013. I chose to compare these articles, to analyse the scientific development of innovation as research object over time and retrieve insights from a number of different perspectives. Different authors have examined over time numerous types of innovation I have summarized these important perspectives in a graphic, **the taxonomy of innovation**, hereunder in **Figure 1**:

Figure 1: Taxonomy of Innovation

SCHILLING	INSEAD	KEELEY	DRUCKER
• Product/Process • Radical/Incremental • Competence Enhancing/ Destroying • Architectural/ Component	• Institutions • Human capital and research • Infrastructure, • Market sophistication • Business sophistication	• Profit • Network • Structure • Process • Product System • Product performance • Customer engagement • Brand • Channel • Service	• Unexpected occurrences • Incongruities process needs • Industry & Market changes • Demographic changes

When summarizing the different theories and concepts of innovation, I see the following differences:
- Drucker (1985) examined the origins of innovations like the events and/or circumstances that enable innovation, like unexpected occurrences or industry and market changes.
- Keeley (2013) explains that there are ten innovation types and he build a framework to give more insight within three categories of innovation types.
- On the other hand, management institute INSEAD (2014) identifies five innovation pillars, where they mainly focus on the impact of external factors.
- Schilling (2015) looks at innovations according to their character. They can be innovations in products or in processes, they can be radical or incremental, they can enhance or undermine the current competence of an organization or business, and they can be innovations of overall architecture.

The authors are emphasizing different concepts within their theories. In particular, Drucker and INSEAD are focusing more on the external environment wherein innovations can take place. In their articles the external environment is changing and can create opportunities and threats. Companies need to develop responsiveness and flexibility to use the environment as leverage to innovate.

Keeley and Schilling looking more at the internal aspects such as processes and capabilities of companies, they refer to the strengths and weaknesses of companies. They deconstructed the different ways how companies need to operate to bring forward innovations that matter. Thus, the external and internal accents are complementary on each other and give an broad base which concepts are relevant for innovation to emerge.

What the different authors have in common is that innovation stands for developing something new or better and there are different resources (internal or external) needed and combined to achieve innovation. Innovations can emerge when there is value created for customers and innovations over time become commodities and will be replaced by other innovations in changing environments.

When I look at the components of LSM and the concepts of the mentioned articles, I can connect the dots between them. Within paragraph 3.5 I will explain and elaborate on the components of LSM in further detail. Here I will concentrate on the brief LSM definitions:

- Schilling (2015) characterises innovations within products or in processes and competences. Ries (2011) motivates that innovating is building a methodology around a development of a product. Therefore LSM can be seen as an innovation approach that structures and simplifies the process.
- INSEAD (2014) looks at innovation through business sophistication and Human Capital. Business sophistication concentrates on higher efficiency of production of goods within a nation. LSM concentrates on better resource usage. Human Capital refers to a human skillset, where LSM also promotes companies to support employees to learn and fail to deliver a better product.
- Keeley (2013) proposes that internal concepts can help companies to get more innovative through their configuration, offerings and experiences. He also emphasizes that companies which create the best value proposition will improve their customer engagement. Important within LSM is creating feedback loops with future customers to see what their needs are. By constantly using these feedback loops to improve a product. Ultimately, a company can produce a better product according to their customer's needs.
- Drucker (1985) examined the origins of innovations like the events and/or circumstances that enable innovation, like unexpected occurrences or industry and market changes. Within LSM, uncertainty is a very important aspect. LSM creates a structure where companies can create new products and services within environments within extreme uncertainty. Validation of assumptions is most important to verify if the development products appeal to customers needs.

What I learn from the different authors is that their proposed concepts are applicable within certain context and LSM is an innovation strategy which cannot be plotted within the scientific literature. Blank (2013) refers with LSM to a customer development process, where lean principles are used to eliminate waste of time and resources in order to lower the failure rates of startups within environments of great uncertainty.

The concepts and the manifestations of LSM can be found within the several theories of the different authors. I can conclude now that LSM cannot be characterized within a single innovation theory. LSM is an innovation strategy that covers many innovation concepts and the applicability is large.

3.3 Innovation Capabilities

To retrieve more traction and to grow, every company must have to develop specific capabilities, in my case innovation capabilities. These capabilities can be described as an extensive set of a company's innovation configuration that enables them to innovate in a way that aligns with their strategic activities (Van Hemert et al, 2013).

Van Hemert et al (2013) refers to innovation capabilities as the source that instigates creation and development of new products and services which can create new business models to gain more economic impact. Eventually, to achieve a competitive advantage were value propositions are essential to strengthen customer loyalty.

For example, in the empirical study of Yam et al (2011) they researched manufacturing industries in Hong Kong and they recognized that companies with greater innovation capabilities reached greater competitive advantages and higher efficiency rates. So, improving innovation capabilities will result in achieving a competitive advantage, therefore innovation capabilities have much attention in the scientific literature. When companies are able to develop their innovation capabilities, eventually this will result in a competitive advantage and higher efficiency rates. However, the question I have is: How can companies develop their innovative capability?

Researchers such as Selznick (1957) and Lall (1992) conducted researches to comprehend the innovation capabilities by identifying the concepts that are important to companies. Their researches were extensive and they conducted under certain labels such as human resources, distinctive competencies specific skills, invisible assets, organizational competences, absorptive capacity, organizational capabilities, technological capabilities and marketing capability.

These concepts are the result of the company's innovation configuration, which entails different synergistic processes which allows companies to develop, internalise and produce new products and services. This Innovation activity according to Van Hemert et al (2013) can represent an interactive process where technology, systems and processes have underlying linkages with each other. The company's ability to strengthen these underlying interlinkages will result in improving the innovation capability.

Based on the articles of Selznick (1957), Lall (1992) and Van Hemert et al (2013), they mention their definitions of innovation capability and what these underlying concepts are. However, the ways how these underlying concepts interact with each other, are not mentioned. Gaining insight in these interactions will increase the comprehension how the innovation capability can be improved.

Zawislak et al (2012) have done just that. They state that the innovation capability can be divided into four underlying concepts: technology development, operations, management and transaction. Important to know is that all companies have the availability of these capabilities, it is necessary to know how companies are using these capabilities simultaneously and to what extent. Ultimately, to successfully innovate, a company needs to combine them to one, the innovation capability, which creates a competitive advantage.

According to Zawislak et al (2012) innovations occurs using the mentioned complementary capabilities. Of course, a technological innovation is an obvious type of innovation. There are more types of innovation available, many companies innovate and still do not technologically innovate.

The complementary capabilities can be formed by companies in order to create new configurations that enable them to innovate in a way that other companies can't copy. The assumption of Reichert et al (2014) is that this advantage can be used to increase the innovation capability.

In **Table 1** the innovation capability is divided in the mentioned four different complementary capabilities, see hereunder. The definitions form an extensive description of each complementary capability:

Table 1: Complementary Capabilities (Zawislak et al (2012)

Capability	Definition
Technology Development capability	The ability that any company has to interpret the current state of the art, absorb and eventually transform a given technology to create or change its operations capacity and any other capability aiming at reaching higher levels of technical-economic efficiency.
Operations Capability	The ability to perform the given productive capacity through the collection of daily routines that are embedded in knowledge, skills and technical systems at a given time.
Management Capability	The ability to transform the technology development outcome into coherent operations and transaction arrangements.
Transaction Capability	The ability to reduce its marketing, outsourcing, bargaining, logistics, and delivering costs; in other words, transaction costs.

Zawislak et al (2012) claim that the technology development capability and the management capability form the essential competences for companies. These capabilities are enabling companies to learn and internalise new knowledge in ways that companies are able to find, create and offer new products and services managed by supporting operations and interactions.

In order to master these processes, companies must be able to control and optimise them. This capability is known as the operations capability. This capability means that companies optimize the production capacity by collecting different resources, such as knowledge, skills and production plans that enable them to keep a steady output. To manage the operation, the management capability is a crucial mechanism to shape and guide technological outcomes to operate smoothly.

They have designed a framework where they explain that companies internalise new knowledge and convert this knowledge into technological outputs which result in customer demands. When companies are aligning their knowledge and technological capabilities to bring forward new market means, they are transacting technology as an important driver for competitive advantage.

According to Zawislak et al (2012) innovation capabilities can be diverted in two domains: **technology driven capabilities** and **business driven capabilities**. See hereunder the framework, **Figure 2**:

Figure 2: Innovation Capability Framework
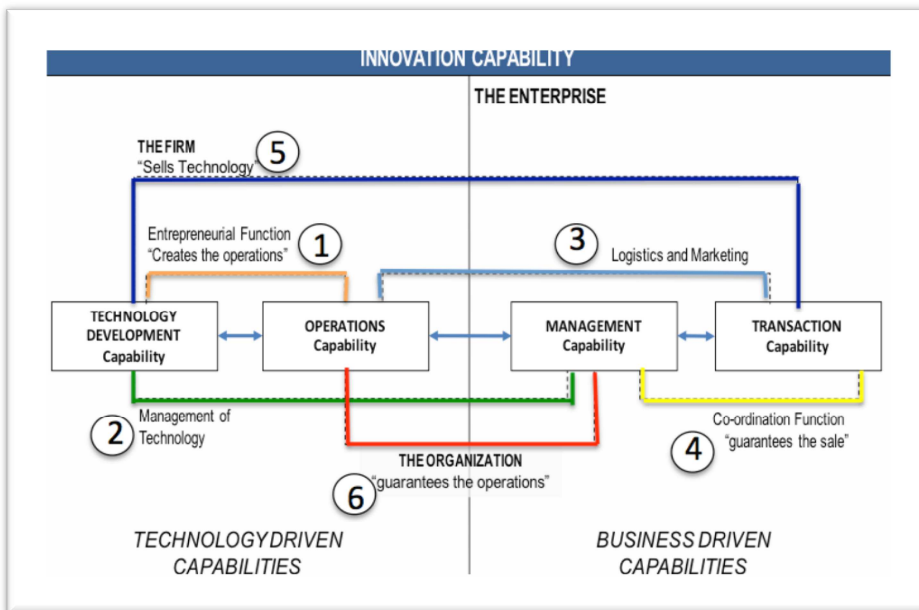
In the framework of Zawislak et al (2012), here above, they have determined six different functions between each capability.

1) The technology development capability focuses on the processes companies have in place in order to engage learning loops and use their market responsiveness to internalize new experiences and knowledge. These processes are essential to translate and produce technological solutions by creating new production methods and processes.

2) The management capability is the major connecting component. This function makes it possible that technological solutions can be shaped and guided to operate smoothly. It entails the ability to transform potential technological solutions and innovations into operational activities. Management has to coordinate the procedures, processes, agreements and resources in order to operate efficiently. In circumstances where uncertainty is applicable, this capability will be of great importance.

3) The logistics and marketing function makes it possible to optimise the planning and logistics of goods, in order to meet customer demands. Good distribution can lower transportation costs and increase availability of goods.

4) The linkage among the management capability and the transaction capability is described as the coordination function. The coordination function implies the procedures and agreements whereby companies have to oblige.

 5) The assumption is that technology has to be commercialised in order to generate cash flows. The transaction capability connects companies to the market. Several activities are needed (customer service, sales) in order to where the technological change must follow.

6) The operations capability ensures that procedures and company processes are stable in order to guarantee the activities of the company.

3.4 Innovation conditions

Creating favourable conditions are essential to optimally instigate innovation. I have read numbers of articles where favourable conditions are outlined. My efforts laid in the understanding what scientific literature determines under ''innovation conditions''. I want to identify the important innovation conditions to understand the essential benefits.

Laforet (2011) investigated that companies who use innovation are better equipped to develop products and services customers really want. They create value propositions and differentiate in strategic ways to leave competitors behind. Also, striving for innovativeness changes companies' outlooks, goals and strategies, defining their short and long term planning. Therefore companies put great effort in developing coherent activities, by changing their product development, technological differentiation and product lifecycle change based on targeted customer groups.

Due the fast growing technological developments, products have shorter lifecycles and therefore their technological value decline swiftly, with the result that companies have little payback time (Dadfar et al, 2013). Small to medium companies don't have extensive R&D budgets to experiment and develop new technologies, instead they use existing technology in new markets. These companies are more flexible to change direction and their business model. These companies create opportunities throughout the existing innovation conditions (Laforet, 2011).

Bayarcelik et al (2014) executed an extensive research where their goal was to examine which innovation conditions are crucial. They found that in the United States small and medium companies are representing almost 98% of the administrated companies. Even more, in Italy, Japan and France the small and medium companies are representing almost 99% of the administrated companies. To a larger extent, in Turkey small and medium companies represent even 99,9% of the administrated companies. So, they interviewed 33 managers and owners, to obtain crucial innovation conditions, see **Table 2: Innovation Conditions.**

Their research examined the innovation conditions which are contributing on the innovation results of these small and medium companies. In **Table 3: Weights of Criteria**, the perceived importance of the innovation conditions by the interviewees:

Table 2: Innovation conditions
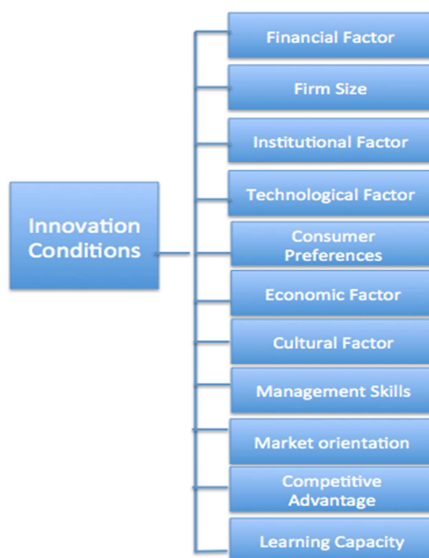
Table 3: Weights of criteria

Criteria	Weights
Management Skills	1,9638
Technological Factor	1,1731
Financial Factor	1,1403
Firm Size	0,9337
Market Orientation	0,7376
Economic Factor	0,4837
Consumer Preferences	0,3564
Cultural Factor	0,1625
Institutional factor	0,1053
Competitive Advantage	0,0532
Learning Capacity	0,0477

Source: Bayarcelik et al (2014)

To take in perspective, the research of Laforet (2011) concentrates on the impact of innovations on companies' financial performance, such as financial risks, uncontrollable business growth, companies' image and reputation loss. Of course, the financial aspect is important to recognize as an innovation condition, however this is one-sided.

The research of Bayarcelik et al (2014) demonstrates eleven innovation conditions, divided into four themes: management-, technological-, financial- and firm factors. I will summarize the different innovation conditions, one by one, in order to give substantial information about each innovation condition.

3.4.1. Financial Factor

Financial strengths determine the innovation results of companies. Lecerf (2012) stipulates that the financial factor is an essential part of innovation. In order to innovate companies do need to have resources they can use and combine to achieve an innovative capacity. The innovation capacity consists of usage of resources, problem solving processes, knowledge and experiences and cooperative departments. Within startups, their innovation capacity is under pressure due the lack of the financial factor, which results in less resources and little knowledge (Laforet, 2011).

The financial capacity is crucial for companies to expand their business. The financial capacity is not the only factor to achieve a higher innovation capacity, but it is crucial one, especially for small and medium companies. Investments can only be done when sufficient funds are available within the company or the company is capable of generating funds from banks or investors, these two aspects are difficult for small companies. Xie et al. conclude that small companies experience their inability to generate funds as their main difficulty in comparison than larger companies (Xie et al, 2013).

3.4.2. Company Size

The company size is of great importance in determining the possibility to achieve knowledge and technology (Davenport and Bibby, 1999). Their research pointed out that larger companies are better capable of producing and internalising technology.

They motivate their claims by enumerate four arguments:
1. Of course, larger companies have bigger cash flows in order to finance their innovation capacity. Also, larger companies have access to capital markets and can use their cash flows and/or assets to retrieve funding.
2. Furthermore, large companies have huge sales volumes where they are can spread the fixed costs over the volume of products. The result in that the fixed costs per unit will decrease.
3. Large companies are able to gain in-depth knowledge, retrieving and using human capital and using experts to mitigate uncertainties, which can boost their innovation (O'Cass et al, 2009).
4. Also, large companies can use their existing resources and can acquire numerous resources. The combing of these resources are enabling companies to increase their innovation capacity and ultimately, achieving a competitive advantage. Small companies do not have these possibilities. These companies constantly have to prioritize and make trade-offs in their investment policy, with the result that they cannot act swiftly on market opportunities when expensive invests are needed.

3.4.3. Institutional Factor

The institutional factor refers to the external environment of companies. In environments were the institutional structures are challenging will affect the performance of companies. Factors such as economic instability, poor human rights policies, strict fiscal regime, political pressure and bad infrastructure will lower innovation (Volchek et al., 2013).

3.4.4. Technology factor

Developing new products are expensive and risky. Companies are joining forces in order to create a platform, defining standards and keep profits steady. This increases the innovation speed in a certain industry, although cooperation between competitors can result in major cash drains and legal issues (Gynawali and Park, 2009).

3.4.5. Customer Preferences

Customers are responsible for innovation. Companies are constantly searching for new products and services to solve consumer problems. Companies who are responsive and meet the needs from their customer are profitable. So, more companies are involving their customers in their product plans and experiment to develop better products customers want to buy. This co-creation leads to bringing forward differentiated products, deepen the customer intimacy, building a stronger brand identity and profitable value propositions (Laforet, 2011).

3.4.6. Economic Factor

The economy is the driving force for prosperity and creating a favourable climate for investments (Rujirawanich et al, 2011). Companies are more willing to investment in innovation when economic indicators are opportune, this results in low capital interest rates, a high consumer confidence and a liberal economic. These factors are boosting investments, creating new demands and jobs. Subsequently, a great economic climate will result in investing in technology, creating innovation (Karpak , 2010).

3.4.7. Culture Factor

The organization culture influences the performance and therefore the results of a company. The organization culture can be described as the ''mindset'' of the company. Culture consists of values, norms, symbols and rituals. Schein (2004) claims that the organizational culture can be changed. He sees culture as one of the most strong and stable forces within a company. The cultural model of Schein (2004) consists of three levels, see **Figure 3: Levels of Culture**.

At the lowest level ''basic undergraduate lying assumptions'' these the are the basic assumptions which include perceptions and beliefs that people are not aware and are very difficult to change and form the base for the next layer.

That middle layer "espoused values" consists of values and norms, or the conscious values that are communicated and function among others as normative and moral anchors.

In the upper layer ''artifacts'' come forward as manifestations of a company, including buildings, decoration of offices, parking spaces for senior management, clothing manners and leadership style.

Figure 3: Levels of Culture (Schein, 2004)

According to Andriopoulos (2001) changing the organizational culture can be done by setting new values that will eventually influence the norms. So, norms are derived from values and values thus lead to specific norms. These norms can function as guidance for employees to know which behaviour is desirable in the new context.

Innovation is all about taking risks, patience, forming a long-term vision, learning, failure, trial and error, are labelled as an innovative culture (Castro et al ,2013). Innovation means accepting that employees will (openly) will make mistakes are allowed to do so, to create the ultimate idea. Andriopoulos (2001)

prescribes that innovation is possible by supporting entrepreneurship and enable employees to learn and fail without consequences.

3.4.8. Management Skills

Now we discussed the culture factor, managers can create and maintain the targeted norms and values (Ling, 2002). Managers have an important role developing new values and creating the requisite norms. Even more, managers have the opportunity to define the organizational goals by determining ''why'' these goals are important, ''how'' these goals can be achieved and ''what'' employees need to do (Kelley et al, 2011).

Wolpert (2002) emphasizes that successful managers achieve these results by using different techniques and interpersonal competences. Successful managers have a solid vision, which means that they know what they want and can also convince and motivate others to follow. They possess a natural authority and improve departments or companies by combining different resources and setting course to their destination.

Ling (2002) finds it essential that managers find the balance between steering and self-organization. This concept is central in an innovation context. Successful managers develop a style where there is balance between establishing guidelines and instructions. Where giving employees space for personal interpretation and sufficient support.

Ling claims that managers need to use other competences during different stages of an innovation process. From generating ideas till producing a product, during each phase, managers need to have different competences and assessment criteria. Thus, managers need to have a full range of specific competences and they need to know when to use them and in which situation. This can be challenging for certain companies and that make the difference between success or failure.

Another aspect according to Wolpert (2002) is that the management skills define the management style. The management style describes the organizational configuration and can serve as a prediction indicator. Choosing a management style where managers are acting on the background, creating freedom, letting employees experiment, support ambiguity and strengthen collaboration are requisite factors for innovation. By breaking the walls within silos, seeking other people, support social innovation will increase the probability of harvesting new ideas and solutions (Wolpert, 2002).

An interesting fact of innovative companies is they can quite easily generate new ideas from different sources and internalise new means within the company by learning from others(Kelley et al, 2011). Managers need and have to support entrepreneurship among employees, encourage employees to fail and learn, make resources available, diminish bureaucracy, appeal to the collective imagination. All these activities will create an impact and will eventually change the organizational culture, values and norms become more open for innovation (Wolpert, 2002).

3.4.9. Learning Capacity

This capacity can be defined as the distinctive and common way companies gaining knowledge, skills and attitudes by experience (Günsel et al, 2011). In this definition, the employees are learning and therefore the company as a whole is learning. In order to increase the learning capacity of a company, employees must be able to acquire new knowledge, which is necessary but not a sufficient condition. Only when employees share their learning experiences and others can integrate the new knowledge into their operation, products and services, then it's a learning organization. (Günsel et al, 2011).

The higher the learning capacity, the better companies are able to innovate (Calantone et al, 2002). The learning capacity defines the ability to identify market threats and opportunities, swiftly react to market changes, learn quicker than competitors and launch new products to gain a ''first movers advantage'' to seize market share (O'Cass et al, 2009).

3.4.10. Market Orientation

Consumer needs are changing rapidly due the technological developments, in order to become more responsive and oversee the changing marketplace, companies need te become more market oriented. Kohli et al (1990) define market orientation as an ability where the whole organization induce market intelligence and distribute the obtained intelligence within departments to create an organizational responsiveness, which eventually will lead creating a market oriented culture.

Market orientation is used as a guidance to establish the company's business strategy. The authors place market orientation as marketing's instrument to measure the performance between companies. Market orientation is the result of strong sense making market responsiveness. This can be a great ability when a company is active in a competitive market with unpredictable circumstances.

The concepts of market orientation are customer focus, marketing coordination and profit of marketing. The mentioned concepts concentrate on retrieving customer information and how companies integrate the information to develop customer centric activities. According to the authors, market orientation is essential when companies have place a greater emphasize on innovation. Many authors claim that the stronger the market orientation is, the better companies are able to create new products and services (Wang and Chung, 2013).

3.4.11. Competitive Advantage

Competitive advantage is realised when a company has gained an advantage over its competitors when it's able to launch a product or service that stands out in the crowd by offering a value which customers perceive as differentiated and are willing to pay for (Porter, 1998). Michael Porter constructed his value chain theory, which is used to determine where a company can create its value within their primary activities and support activities. This created value indicates the competitive advantage of the company. This is important to achieve, because this value determines how much customers are prepared to spend money for a product or service of the company (Porter, 1998).

The value chain of Porter(1998) shows the generated value contributed by activities and the obtained margins. The value activities are divided into primary activities and support activities. These are the building blocks for a company to create products or services which are valuable for the customer. In this case, the margin is the occurred difference between the total generated values minus the production costs within the chain. Porter has developed four business strategies that companies can use to achieve a competitive advantage: cost leadership, cost focus, differentiation and differentiation focus.

According to Prajogo (2006) innovation is an important aspect of creating a competitive advantage. For example, offering an innovative product customers really want, companies can realize a first mover advantage. The company will benefit from several advantages, like a lead in experience and knowledge, capturing key resources such as good locations, employees and materials and a competitor-free relationship with customers.

Thus, when the company has a good value proposition throughout innovation this will eventually lead to a competitive advantage. The supporting aspects such as a good location, a strong brand identity, and customer intimacy, combined, are hard for competitors to obtain and to duplicate. This will result in a sustainable competitive advantage, where the company creates high entry barriers (Chen et al, 2009).

3.5 The Lean Start Up

The creation of a new company always involves uncertainty. One of those uncertainties is the hazard of producing a product or service that customers don't want. Trying to minimize that hazard, Eric Ries' (2011) LSM addressed a fundamentally new way of founding and guiding startup creation. His methodology is derived from literature from authors such as Henry Ford, Taiichi Ohno (founder of the Toyota Production Philosophy) and his mentor Steve Blank (2013).

These authors are inspired by creating a development process where efficiency increases and products wastes are lowered, these determinants are applicable ever since in product development. Blank and Ries were inspired by the McGrath and MacMillan (1995), because they proposed ways to improve the entrepreneurial mindset within companies. So, Ries used different theories and his experience to optimize his methodology, so there is no motivation to question his methodology within this research.

The elaboration on Ries' (2011) framework requires a detailed understanding of the three different stages described by him in his book. The build stage is mostly concerned with the creation of a MVP and the implementation of earlier learned results into the product or service. Rather than bringing a finalized version of a companies' product to the market, LSM endorses the creation of an early version and its constant improvement through direct customer feedback.

3.5.1. Background

LSM (Ries, 2011) is a methodical approach to create entrepreneurship, this leads taking product development into small measurable steps develop products customers really want. In the literature Ries describes his experience regarding product development within companies. He says that companies have great ideas for launching a product that will make a difference in the market. These companies are spending months or years developing and fine-tuning the product without ever producing a proper prototype customers can evaluate.

Eventually, the product does not appeal to the customer needs and/or the product is outdated and becomes a failure. So, the company failed in retrieving the customer needs, because they never created feedback loops with future customers and gained insight knowledge what customers really want in order to build the product according to their customer, specific needs.

Ries claims that predicting the future becomes impossible then and companies fall back on their traditional product development processes, with little learning from previous failures. He explains that companies use long term planning. The effects are that companies wasting time, fund and efforts, ultimately discovering, too late, that the product is a failure. Ries describes that creating new products and services involves uncertainty. He claims that initial business plans are doomed to fail when proposed to customers, companies cannot forecast the future and have little payback times.

3.5.2. The concepts of the Lean Start-up Methodology

Steve Blank (2013) states that LSM consists of five essential concepts which now are now fully adopted within the startup scene and within certain large companies. Also, business schools are teaching these five principles which emphasize the practical use of LSM. Hereunder the five principles:

Figure 4: Principles Lean Start-up Methodology

1	2	3	4	5
ENTREPRENEURS ARE EVERYWHERE	ENTREPRENEURSHIP IS MANAGEMENT	VALIDATED LEARNING	INNOVATION ACCOUNTING	BUILD-MEASURE-LEARN

Entrepreneurs are everywhere

Entrepreneurs have to cope with lots of uncertainties right from the start. Writing a business plan is perceived as a difficult and time consuming task by some entrepreneurs. However, with the Business Model Canvas from Osterwalder (2010) entrepreneurs can summarize their business issues in a clear and visual way. On the basis of nine building blocks describing the organization, earnings, customers, business partners and supplier this can be done. Their framework shows how the value proposition is generated, see also *Appendix 1: Business Model Canvas.*

After summarizing the business issues, it's time to "get out of the building" where entrepreneurs are ought to seek and speak with future customers in order to validate their untested hypotheses. It's crucial to gain input from future customers, stakeholders and investors regarding nine concepts within their framework. These building blocks create a holistic view and have visible linkages where synergy can be realized.

Ries claims that successful startups are able to produce a minimum viable product (MVP) where they engage customers to give feedback, so creating feedback loops. These feedback loops are used for validating their assumptions and refining their MVP. These refinements are called ''iterations'' and when these refinements are needed to change substantially, they are called ''pivots''. This process is a cycle where constantly testing and refining are essential for the success of the initial product launch.

Entrepreneurship is management

Ries proclaims that startups are developing a new product within circumstances with great uncertainty. So, entrepreneurship entails the process of learning by doing, however Ries claims that companies need to create order to achieve better results in uncertain environment. Therefore companies should manage their activities to create more impact.

Blank (2013) calls this process also Lean Startup Management. LSM is developed with the goal that companies reduce their waste and learn quickly and fail cheap. More important is that LSM entails a process, a practical methodology regarding the creation of a new products or services.

Validated learning

Ries does not emphasize on profit, but he focuses on validated learning: quickly validate a hypothesis. Ries proposes that when companies execute validated learning successfully they are one step closer in producing a product the customer wants. Validated learning entails small steps where learning and testing customer needs are important. When companies use validated learning, eventually their development process will decrease. So, wasting time and money can be prevented with validated learning. Validated learning makes it possible that companies learn to build a sustainable business. Learnings are therefore essential by running several experiments, using MVP's.

Ries defines a **MVP** as a future product. With this MVP companies can start the experiment and they can use validated learning to retrieve and engage customer feedback. These feedback loops are enabling the companies to maximize their learnings in order to comprehend demands from future customers and making improvements meeting these needs. After each feedback loop the proposed features are added to the MVP, which again have to be validated, eventually creating a product costumers want to buy.

Innovation accounting

LSM proposes that traditional accounting methods do not apply on startups. In a world of uncertainty it's hard to use discounted cash flows and determine payback periods for startups. These are static indicators, which can function greatly within established companies. Therefore Ries (2011) proposes his innovation accounting method, the benefit of this accounting method is that investors can determine the achievements of a startup not by their gained profit, but by measuring their *achieved learning*.

Ries emphasizes that measuring their achieved learning creates a better understanding and focus. Profit is not important in this phase, startups need to find their business model and should investigate how their customer is. Eventually the achieved learnings will be become numerous and profitable where the startup will turn into a scale up. From this point on, profit will become more valid to measure the progress the company is making.

Build-Measure-Learn

LSM is all about building a structure for innovation by building, measuring and learning. A central component of LSM is the build-measure-learn loop. A company starts with developing a hypothesis which need be validated by creating a MVP. From this point, the company will start measuring and learning by creating feedback loops with future customers. The linear linkages can be drawn using different measurement metrics to test and validate product iterations, eventually leading to launch the final product in the market.

Eric Ries claims that the key to entrepreneurial success is related to the learning progress an organization undertakes, a process that he describes as validated learning. Ries (2011) therefore presents a feedback loop (*Figure 4: BML Loop*) which contains of Build, Measure, Learn.

That guides and facilitates the desired learning progress. Speeding up the time required to go through the different stages would therefore also accelerate the process of making the product more applicable to customer needs. Decision making during the lean startup stages often leads to changes that will kill current operations. Therefore, the credibility of the data is necessary to ensure the acceptance of the on it based decision (Ries, 2011).

The final stage, learn, requires the evaluation of the measured data and the choice whether to pivot (change aspects of the current strategy) or persevere (continue with the current strategy). The learned insights are then implemented as new features to complete the loop.

Figure 5: Build-Measure- Learn Loop (Ries, 2011)
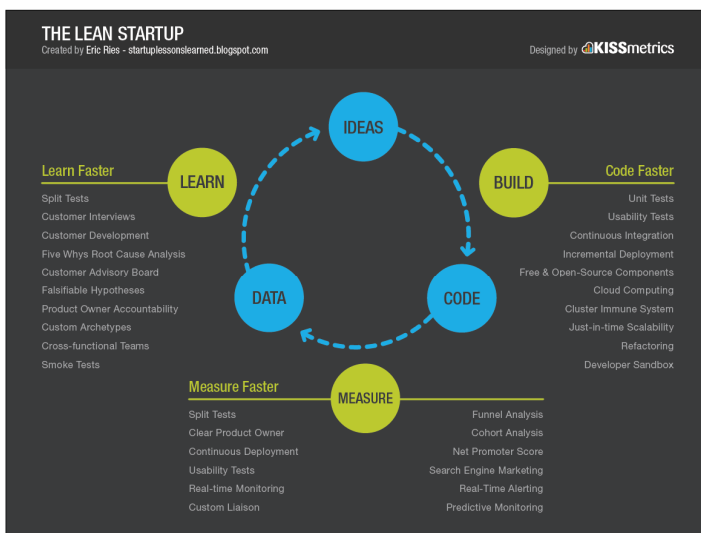
4. Conceptual Model

4.1 Outcomes Literature Review

These outcomes of my literature review will enable me to integrate, summarize and connect what is known about innovation capabilities, innovation conditions and the LSM in order to build my conceptual model. Each research subject or variable has certain drivers according to the scientific literature. In **Table 4** there is a brief overview of the important concepts of each mentioned variable:

Table 4: Drivers per variable

Lean Start Methodology	Innovation Capability	Innovation Conditions
• Entrepreneurship • Management • Validated Learning • Innovation accounting • Customer Preferences	• Transaction Capability • Management Capability • Technology Development Capability • Operations Capability	• Management Skills • Technological factor • Financial Factor • Firm Size • Market Orientation • Economic Factor • Consumer Preferences • Cultural Factor • Institutional Factor • Competitive advantage • Learning capacity

Yam et al (2011) propose that companies with strong innovation capabilities can achieve more efficiency, value creation and economic impact. So, Innovation capabilities as source of competitive advantage for organizations are therefore an important issue in the scientific literature. To develop an innovation capability, the right conditions have to be in place to fully benefit from the innovation outcomes.

4.2 Components conceptual framework

The benefit of my research lies in the determination of the specific, critical innovation conditions, in combination with LSM. I assume that companies, who are willing to adapt the lean start up method, first have to look if these innovation conditions are in place and change where possible, to adapt the LSM successfully. In this section I will propose my hypotheses followed by the components of my conceptual framework. Important is to elaborate the different definitions of each research subject.

Lean Startup Methodology

Ries point up an important step within LSM, which is engaging employees to get out of the building and empower the process of learning by doing. Companies need to create order to achieve better results in an uncertain environment. Therefore companies should manage their activities to create more impact. I find it relevant to know how companies have put the entrepreneurial activities into a process and manage the steps within this process. I refer to the LSM drivers Entrepreneurship is Management, where Blank (2013) refers to Lean Startup Management.

Another important step of LSM is Validated Learning, where validating a hypothesis quickly is decisive. Ries proposes that when companies execute validated learning successfully they are one step closer in producing a product the customer wants. I want to know how these feedback loops are organised and what the benefits are of Validated Learning.

Thus, I have chosen the drivers Lean Startup Management and Validated Learning, because they form the hart of LSM and will also represent the independent variables of my conceptual framework.

Innovation Capabilities

The innovation capabilities consist of the technology-, operational-, management- and transaction capabilities. In chapter 3.3, Zawislak et al (2012) claim that the technology development capability and the management capability form the essential innovation capabilities, because these capabilities are enabling companies to learn and internalise new knowledge in ways that companies are able to find, create and offer new products and services managed by supporting operations and interactions.

The relevance lies in how LSM can improve the innovation capability. So, I assume that LSM can improve the overall innovation capability by supporting these essential capabilities. LSM doesn't pay much attention to factors like production capacity, which refers to the operational capacity and to transaction costs, which specifically refers to the transactional capability.

Also, LSM concentrates with Lean Startup Management putting the entrepreneurial activities into a process and manage the steps within this process, which corresponds well with the management capability, where managing operations and interactions are embedded. Validated learning refers to the feedback loops that enabling the companies to maximize their learnings in order to comprehend customers' demands. This corresponds well with the technology development capability, which refers to the processes companies are learning and internalise new knowledge. Therefore the chosen capabilities will be isolated and investigated in detail to determine the effect of LSM.

Innovation conditions

Startups prove that an innovation condition like financial factors will help to speed up the innovation process, not the way of innovating. As well as an innovation condition like competitive advantage is more the product of successfully innovating and offer customers something what they want, what others cannot. According to Ries (2011) getting innovative means changing the processes which ultimately change the organization culture, where he emphasizes that people need to change in order for the company to change.

Van Hemert et al (2013) states that know-how, experiences and skills are anchored within employees and managers. The company's ability to undergo a culture change is associated with the processes of learning and adopting, both at the individual and the organizational level. Introducing LSM in a startup environment will be most beneficial in an innovative culture. However, introducing LSM within a conservative company culture, such as a bank, will be challenging to change the traditional ''mindset'' Schein (2004) hereby refers to changing the company's culture, resulting in new values that eventually influence the norms.

Therefore the innovation conditions Culture and Management Skills are important for my research. The manifestation of LSM as a business strategy is interesting to investigate on two levels, team and department level:

Team level: Creating innovation conditions that can foster LSM within a company are essential for improving the innovation capability. According to Wolpert (2002) good management skills where creating freedom, letting employees experiment, support ambiguity and strengthen collaboration are requisite factors for innovation.

The management capability makes it possible that technological solutions can be shaped and guided to operate smoothly. It entails the ability to transform potential technological solutions and innovations into operational activities. Management has to coordinate the procedures, processes, agreements and resources in order to operate efficiently (Zawislak et al, 2012).

I assume based on the literature that supporting entrepreneurship among employees and encourage employees to fail and learn, make resources available and diminish bureaucracy (Ling, 2002) is essential for LSM as an innovation strategy. So, I suppose that LSM only can flourish when managers have supportive management skills to implement LSM to accelerate the management capability.

H1:   LSM needs supportive management skills to accelerate the management capability.

Department level: The technology development capability focuses on the processes companies have in place in order to engage learning loops and use their market responsiveness to internalize new experiences and knowledge (Zawislak et al, 2012). These processes are essential to translate and produce technological solutions by creating new production methods and processes.

LSM is developed with the goal that companies reduce their waste and learn quickly and fail cheap by offering a practical methodology within product development Ries (2011). LSM can improve the transformation of technological solutions to operate smoothly. Also, LSM helps increasing efficiency by eliminating waste and achieving better resource usage. LSM encourages companies to use validated learning to develop new products customers want (Ries, 2011).

An organizational culture where taking risks, learning and acceptance that employees will make mistakes are allowed can be described as an explorative culture (Castro et al, 2013).

So, based on the scientific literature, I assume that LSM can improve the technology development capability by strengthening the learning loops and use validated learning in order to internalize knowledge to produce better products. LSM can only flourish within an explorative culture, were learning and failing are allowed. I propose that an explorative culture has a positive, moderating effect on LSM, in order to retrieve sufficient traction to improve the technology development capability.

H2: In an explorative culture, LSM will have sufficient traction to improve the technology development capability.

4.2 Conceptual Model

The framework represents the influence of innovation conditions as a moderating variable with respect to the implementation of the LSM and the effect on the innovation capabilities of a company. In this research I find it interesting to explore the components Management and Validated Learning of the LSM. These components reflect the beneficial steps of the LSM, see **Figure 6: Conceptual Framework**.

Figure 6: Conceptual Framework
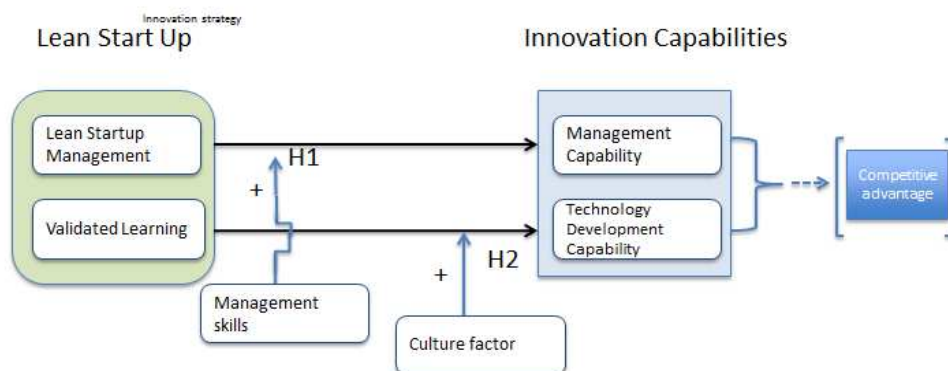
5. Methodology

Hereunder I will point out the research design, the methodological aspects and I will comprise the theoretical analysis and the methods and principles associated within my research.

5.1. Research type and research strategy

5.1.1 Determine research subject

My goal was to seek an interesting research subject that triggered my enthusiasm and had scientific value to be used in a master thesis. LSM as a research subject met, in my opinion, both criteria. Therefore, the next step was retrieving accordance with Professor Jan van den Ende and Dr. Ferdinand Jaspers.

The LSM as a research subject in combination researching semantic relationships was more interesting from a scientific point of view. In this phase I have read many scientific articles to find coherent research subjects. With the result that I executed an extensive literature review regarding the LSM, innovation capabilities and innovation conditions, based on the scientific literature to appropriate the context of my research.

5.1.2. Research strategy

My research contains different steps in order to answer my research questions, see hereunder.

Figure 7: Research Strategy
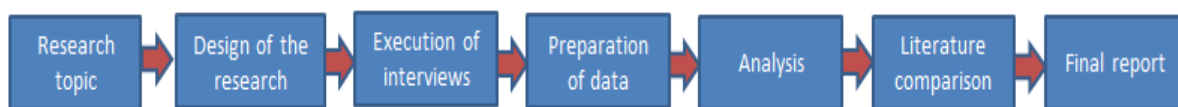
5.1.3 Research approach

My priority lies in investigating the effect of the implementation of LSM on the innovation capability and thereby measures the influence of the innovation conditions. This combination has not been studied previously, my research is from this perspective inductive. Through this approach, theories can be generated, instead of testing theories as in deductive research (Bryman et al., 2007). Nevertheless, there will also be deductive elements are, such as gaining insights from the scientific literature.

This is an explorative research where I choose for a qualitative research approach. Qualitative research primarily concentrates on understanding and interpreting processes, occurrences and developments, important is the specific context where these occurrences are manifested. Qualitative research has a goal to identify cause and effect. An important feature of the process is that data collection and analysis is an iterative process, in other words at the same place, and feedback relative to each other takes place (Bryman et all, 2007) and thus they reinforce each other.

I prepared a literature review to retrieve insight into the different concepts that are central in my research. I made use of high quality articles from publications and articles in scientific journals, Google Scholar and relevant books in the field of LSM, innovation capabilities, innovation conditions, leadership and organizational culture. Based on this literature review I analysed the different concepts and outline the possible, underlying relationships between them. Ultimately, I created from this literature a conceptual mode. Furthermore, based on the available literature I generated two hypotheses to express my expectations about the relationships between the concepts. Both served as a base and guidance for my empirical research.

The conclusions drawn from my literature review were supportive; they were used as input for my interview protocol. To retrieve my empirical data, I choose to use a multiple case study in which I

compared several cases. Through a case study method, it is possible to understand the dynamics within a particular context and is appropriate when there is not much theory available (Dul et all, 2008). I executed my research case study within four organizations, I where I held six interviews. I investigated the effect of the implementation of LSM on their innovation capability and thereby measured the influence of the innovation conditions. This led to test my two hypotheses. To deepen my empirical fase, I interviewed by telephone two interviewees who scored high and low on de research item *organization culture*, to refine the semantic relations between the concepts. Afterwards, I generated my conclusions, future research and limitations.

5.1.4 Research type

Dul et all (2008) describes explorative research as a way to collect and analyse theoretical and practical information and then elaborate in which ways the findings can contribute the development of the theoretical framework. I chose an explorative research, because companies do not explicitly describe their motivations (why), processes (how) and results (what) regarding the implementation of LSM. Also, an explorative research can facilitate the insight if it is worth to continue the research.

I used a case study approach to fully comprehend a ''phenomenon'' within its natural state, in such a way that interdependencies of relevant factors are maintained. The differences between a case study and an experiment, is the fact that within a case study I am able to research LSM within its natural situation. Yin (2003) finds it suitable for a researcher to use a case study approach when:

1. *to retrieve motivations and examples;*
2. *research experiences and opinions from interviewees*
3. *find cohesion within different concepts*
4. *to demarcate major and minor details*
5. *There are usually used various data sources. The most important are participant observation, interviews with informants and available documents.*
6. *The researcher is directed to a detailed description of numerous variables, in order to get explanations of processes on track. Then this can be generalized to a universal situation.*
7. *These descriptions and representations are tested against the descriptions and explanations given by the interviewees themselves.*

By using a case study I will be able to comprehend the context of LSM, where I can derive causality: X causes Y, or, functionality: X is of importance for Y. Where finding linkages with different concepts to fully internalise LSM. So, I believe that using a case study approach I can build new theories, assumptions and will contribute to sense making regarding LSM. So, conducting a case study give me great options to fully analyse LSM in its natural situation (Yin, 2003). My research will facilitate the exploration of the LSM as a phenomenon within its own context using literature studies, observations and interviews. This ensured that my research was conducted throughout different research methods to have a variety of scopes to integrally comprehend the concepts.

5.1.5 Considerations case study

General rule is that the demarcation of the case as a research unit is connected to my research goal, research questions and conceptual model. Yin (2003) claims that the choice that the researcher makes is crucial, because it limits to collect and analyse material, which are often not easy to reverse. Flyvbjerg (2006) proposes that a researcher can generalize based on a single case. A case study can function as an alternative approach, however generalization throughout a case study can be interpreted as obsolete within conventional scientists.

This design is appropriate for me, because it is important in this thesis to examine how the LSM is applied in an organization. Little scientific research has been applied, so my first steps are, inductively, to find and determine which semantic relationships are in play between the researched factors. Such as

5.1.6 Research area

The research area concerns the large companies who have implemented LSM in the past 12 months. These companies have to operate in a commoditized market to measure the effects of LSM on their innovation capability in a ''before and after'' analysis. Large companies struggle to innovate new products and/or business models, throughout the traditional processes. Their products are becoming commodities and the differences between them are little. This causes price reductions and a lower perceived value in the eyes of customers.

Within the banking and energy industry gaining ambidexterity is getting more important for these companies. Within exploration other values and norms will occur and are needed to facilitate employees to be more innovative. With LSM companies can learn fast and fail easy and reduce wasting resources. This motivates companies to invest in product development and research to create new, better products and/or seek new business models.

5.1.7 Unit of analysis

Within in this research, my unit analysis concerns the (innovation) department and the team (members) LSM is only implemented within certain departments, not within the whole organization, because LSM is commonly used in new business and product development areas where the uncertainty is high. These departments are often innovation centres or home grown start-ups within these large companies.

I want to research how large companies have implemented LSM on department and personal level. In my interview protocol I have used questions that measure items on both levels. The cultural item is based on department level and the management skills are based on team level. Thus, making the analysis complete on employee and department level is possible.

5.2 Case selection

My goal within the cases is to gain lots of new knowledge and insights on LSM, where I conclude that random sampling is not advisable (Yin, 2003). When one is randomly sampling the obtained information can be little and not valid. Cilliers (2008) adds that a case study is suitable to research the underlying concepts, cause and effects and linkages. These aspects deliver more insights and knowledge to understand LSM. He also proposes to choose cases carefully based on their validity.

In order to execute a proper research, my goal of this case study is not to obtain a certain image regarding a few companies, I want to determine the manifestation of LSM within a company by comprehend the motivations and experiences from the interviewees (Yin, 2003). So, I carefully selected companies where LSM has been implemented and my interviewees were selected on their knowledge and experience regarding LSM.

The research has been conducted within four companies (six interviews). By researching several cases differences and similarities can be found in terms of dependent and independent variables according to Dul et all (2008).

1. So, my first important step is selecting the right cases for the purpose of my research. I set a few criteria in order to qualify my participants. First, the participating company need to have implemented LSM.
2. Second, the participating company needs to be active in a commoditized market, preferably in the banking industry and/or energy industry.
3. Third, the interviewee of the participating company has to have personal interest in the LSM and/or has experience in applying the LSM preferably in a startup environment and knows by heart the concepts and definitions of LSM. This will enrich the conversations with personal practical examples. Participants validated this third criterion by approving the appointment to meet me in person and form my research population.

5.3. Sample

A case study is a qualitative research method, where validity is an important aspect. Not only a single case needs to be studied, as well as there are a limited number of cases to be studied. "Limited" means that rarely exceeded four or five cases.

I conducted my research within the banking and energy industry, these are industries which can be described as commoditized markets. The participating companies are thoroughly selected, however the advantage was to get in touch with competitors such as ING and ABN AMRO. I can conclude that they were most cooperative about sharing their experiences and knowledge.

Eneco was also eager to help, as well as Rabobank, my employer. I could say that the participating companies are conducted via semi-convenience sampling, because the participants were selected, instead of randomly chosen. The convenient part is that the connection was easily made via my classmates who are working for the mentioned participants.

It is quite difficult conducting a case study to determine a minimum sample size. Authors claim different sample sizes within qualitative researches. Within the scientific research there is no definite answer which sample size is needed for case study. Creswell (2003) determined that the preferred sample sizes for case studies are at least 5 up to 10. The companies can be characterized as a relatively homogeneous population, in the dimensions commoditized markets, large companies and they are inflexible to innovate.

5.4 The empirical setting

The aim of the empirical setting of my research is to investigate if applying LSM is enabling the innovation capability of a company, by choosing the right variables.

Dependent variable: Innovation Capabilities

The innovation capabilities consist of the technology and management capabilities. These capabilities can determine according to Zawislak et all (2012 Zawislak et al (2012) claim that the technology development capability and the management capability form the essential competences for companies. These capabilities are enabling companies to learn and internalise new knowledge in ways that companies are able to find, create and offer new products and services managed by supporting operations and interactions.

Independent variable: Lean Startup Methodology

LSM endorses the creation of an early version and its constant improvement through direct customer feedback. Ries claims that successful startups are able to produce a minimum viable product (MVP) where they engage customers to give feedback, so creating feedback loops. LSM is developed with the goal that companies reduce their waste and learn quickly and fail cheap. More important is that LSM entails a process, a practical methodology regarding the development of a new product.

Moderating variable: Innovation conditions

The innovation conditions have a positive moderating effect on LSM. These conditions can strengthen the adoption of LSM in order to improve the innovation capabilities.

5.5. Research subjects and items

The research subjects of my investigation consist of the dependent, independent and moderating variables, with the corresponding research items. The mentioned variables are the first steps to implement the LSM. The structure my research consisted of six research subjects: Lean Startup Management, Validated Learning, Technology development capability, Management capability, Managers skills and Culture. Each research subject consisted of two or three items to retrieve a better understanding of that specific subject.

5.5.1 Lean Start-up Methodology

I chose to investigate two variables of the LSM, Lean Startup Management and Validated learning:

Lean Startup Management:
Using LSM, companies accelerate the process of making the product more applicable to customer needs. Following these lean startup stages often leads to changes that will enhance the development of a new product. With the items:
- **Entrepreneurship:** Entrepreneurship is management, and vice versa.
- **Innovation process:** The methodology around the development of products.
- **Management:** How to manage the innovation process.

Validated Learning:
Ries claims that successful startups are able to produce a minimum viable product (MVP) where they engage customers to give feedback, so creating feedback loops. These feedback loops are used for validating their assumptions and refining their MVP. With the items:
- **Minimum viable products:** The outcomes in terms of MVP's.
- **Learning cycles:** How validation in the innovation process is embedded.
- **Customer value creation**: The solutions creating new business opportunities.

5.5.2 Innovation capabilities

The authors claim that the technology development capability and the management capability form the essential competences for companies:

Technology development capability:
The technology development capability focuses on the processes companies have in place in order to engage learning loops and use their market responsiveness to internalize new experiences and knowledge. These processes are essential to translate and produce technological solutions by creating new production methods and processes. With the items:
- **Better products:** LSM leads to produce better products that meet consumers' needs.
- **MVP's:** LSM will lead to produce less MVP's with high success rates due validation.

Management capability:
This capability makes it possible that technological solutions can be shaped and guided to operate smoothly. It entails the ability to transform potential technological solutions and innovations into operational activities. Management has to coordinate the procedures, processes, agreements and resources in order to operate efficiently. With the items:
- **Wasting resources:** LSM will improve the resource coordination and eliminates waste.
- **Processes or structures:** Processes and structures change with LSM as innovation strategy.

5.5.3 Innovation conditions:

The innovation conditions Managers Skills and Culture are important conditions which correspond well with the independent variables:

Management skills:
Managers need and have to support entrepreneurship among employees, encourage employees to fail and learn, make resources available, diminish bureaucracy, appeal to the collective imagination. With the items:

- **Management skills:** Type of manager is crucial to implement the LSM.
- **Shit umbrella:** Holding steady course of the innovation agenda.
- **Collaboration**: Interactions with employees and departments to learn and turn as whole.

Culture:
Innovation is all about taking risks, forming a long-term vision, learning, failure, trial and error. An innovative culture means support exploration and accepting that employees will make mistakes are allowed to do so, to create the ultimate idea.
With the items:

- **Experimentation:** Such as risk taking, freedom, creativity and agility.
- **Responsibility:** Employee mandates.
- **Development:** Improving skills of employees.

5.5.4 Research measurements

I prepared an interview protocol to investigate the different research subjects and items within the different companies. The assessment of the various research subjects and items is done on the basis of scoring the given answers on my questions on a score card. These research measurements can be found in *Appendix 3: Score card case studies*, where the scores on each research item are enclosed to assess my scoring method during all the different cases.

Based on a given answer, I grant a score to that specific answer: weak, medium or strong. This ordinal scale with three states allows me to measure that specific research item. An ordinal scale has order and the variable consist out of several values, where the differences are not interpretable. We know that ''strong'' is higher than ''medium'' but we cannot say ''how much stronger'' according to Geert Stevens (Professor Quantitative Methods RSM). Ordinal scales can be used in researches where subjective sense making is applicable to measure the relevance of LSM.

In this research the maximum score can be ''strong'' and is shown as +++. The maximum negative score is + and corresponds with ''weak'' and average as ++, which represents ''medium''. Each score correlates with a certain degree, quality, importance or relevance, gradually.

Example:
The first research subject of my interview protocol is the Lean Startup Management. To investigate this research subject, I divided this research subject into three research items. The first research item is ''Entrepreneurship''. The first question to measure this item is:
''When an employee has a great idea how can they develop that idea into realization?''

An interviewee can give several answers, see hereunder the score card. Based on their answer I can grant a score. I examine their answer and concentrate if they have no guidelines, some guidelines or an entire innovation process to help an employee to develop that idea into realization. Depending on their answer, they can score weak (+), medium (++) or strong (+++).

Weak (+)	Medium (++)	Strong (+++)
no guidelines	*some guidelines*	*innovation process*

When a company answers: ''We don't have any guidelines''. They will score ''weak'', so I will grant them to have one ''+''. The score will be plotted in a confrontation matrix (see example next page), where an overview is created to compare the different scores of the multiple case studies.

Here each research subject has been divided into research items and operationalized into questions and scored per case. In **Appendix 3: Score card case studies**, I have enclosed the initial score cards.

Research subject	Items	Questions	Case 1	Case 2
Lean startup management	**Entrepreneurship**	Idea development	+++	++
		Accountability	+++	++
	Innovation	Innovation process	+++	++
		Better products	+++	++
		Wasting resources	+++	+
	Management	Innovation process measurement	+++	+++

5.6 Data collection

The setting of data collection is threefold: (1) semi-structured interviews with Business Developers, Agile coaches, Innovation Managers and Portfolio Managers respectively from ING, Eneco, Rabobank and ABN AMRO. (2) Observations during my internship at Rabobank HQ with Start-up Bootcamp sessions. (3) Document research, such as vision documents and annual reports of the different companies. From these documents, it has been possible to form an overall picture of the company and developments. And also to understand how leadership and decision making are organized in the company.

5.6.1 Semi-structured interview protocol

In order to retrieve empirical data I chose to conduct semi-structured interview protocol, because this gave me much freedom to focus on my research subjects and when needed, I could be zoom in on specific motivations and experiences of the interviewee to gain more understanding of the context.

In total, six semi-structured interview protocols were conducted. Each interview took at least 50 minutes and some till 60 minutes. For me it was evident that I participated within the conversation and I was fully committed to learn as much as possible within the given time with the interviewee and not making notes. Therefore I took the liberty for all my interviews that they were recorded with the permission of the interviewees.

Table 5: interview list

Name Company	Week	Role
ABN AMRO	14	Innovation Manager
Eneco	16	Program manager
ING	16	Agile coach
Rabobank	17	Innovation Manager
Rabobank	17	Head Innovation management
Eneco	18	Portfolio manager

5.6.2 Observations

I was three months present during and around the development of fintech startups at Rabobank HQ. I had the opportunity to observe and participate in the accelerator program of Rabobank with the cooperation of Start-up Bootcamp, called the Moonshot campaign. These fintech startups are Rabobank's own home grown start-ups, who have found new business opportunities to leverage the Rabobank's business model.

In this period I learned a lot from the people of Start-up Bootcamp, because the whole process was coordinated throughout the LSM phases. I will mention these observations in this research within my conclusions and future research.

5.6.3 Document research

The day before I had an appointment with the interviewee, I read the vision document and the annual report of their company. The financial statements were interesting to see the development of their profit and turnover rates. I have summarized these figures in chapter 6.

Examining these documents gave me insight in their company's perception and the development of their vision and strategy. During an interview I was able to reproduce the information and ask in-depth questions, this helped to retrieve better understanding of their motives and results. I will connect these insights within my conclusions in chapter 7.

5.7 Methods

To investigate the constructs of my hypotheses, an interview protocol was designed. A pre-interview protocol was made to collect information about how questions were interpreted by an interviewee. In terms of understanding the components and definitions of the LSM.

The main interview protocol was made to investigate my research subjects and to test my hypotheses. The interviews protocols were made in the Dutch language in order to make the interview as easy as possible for the interviewee to answer and motivate their answers thoroughly, instead of expressing themselves in a foreign language.

5.7.1 Pre-interview protocol

In the pre-interview protocol definitions of the LSM were tested in order to learn if those definitions were understandable and to test the knowledge of the interviewee. Is was also beneficial that I could test if my questions were understandable and in which natural order the questions cloud be asked to retrieve more understanding, in-depth knowledge and speed.

5.7.2 Main interview protocol

The main interviews protocol was designed to investigate my research subjects. I found that it was necessary to provide the interviewee on forehand information about my role as student, the goals of my research, my research subjects and the estimated interview duration. These actions were made to be transparent about the goals, structure and the interviewee had a better preparation regarding the subjects.

I asked beforehand that I was willing to audio record the interview, so I could work out the interviews afterwards and it was possible for me to produce a transcript of the interview afterwards. And I proactively declared that I send in the transcript of the interview to the interviewee and he/she had the possibility to revise the transcript in order to leave sensitive information behind. They all gave their accordance, so I could aggregate the information at company level.

I also proposed that I would anonymously process the information, when someone felt uncomfortable sharing information. I attempted hereby to lower any restraint of the interviewee or limits giving me censored or acceptable answers. No one used this escape.

I embedded only open questions in my main interview protocol, where incorporated questions to retrieve information regarding my research subjects. During the interview, I used ''how'' and ''why'', open questions, to retrieve information from the interviewees, for example: **'' How do you engage employees to get out of the building?''**.

Based on the answers I zoomed in on their experience and knowledge of the interviewees and then I summarized their answers and ask control questions. This helped to make the interview a conversation, rather than an interrogation.

I retrieved viable answers and the interviewees were comfortable by sharing their knowledge and experiences. The most interesting part was that they gave vivid examples to support their statements Some experiences were obsolete for my research and are therefore not mentioned in the summaries of the interviews, although some experiences could be useful for future research.

So, the interviewees were also actively engaged and passionate about the LSM and gave me information proactively, in this way some questions were already answered. For more information on the interview structure and my main interviews protocol, please see *Appendix 2: Interview protocol Lean Startup Methodology*.

After each interview I gained lots of knowledge regarding the research subjects. My goal was to investigate the specific research subject by focussing on the different items. It was important to concentrate on the specific items and not be led by subjects that were deriving me from my goal. I believe that I have succeeded in that by taking back the initiative from the interviewee when I felt that we were heading another direction. The feedbacks of my interviewees were very positive. I asked them to give me feedback. From them all I got back that they enjoyed the conversation.

5.8 Data analysis

The goal of a qualitative research is to gain insights and relevant aspects to comprehend the research subject by retrieving data. Afterwards, the data needs to be structured in order to be analysed.

Hereunder I describe the steps I have taken from extracting the raw data to analysing the data:
1. I transcribed the interviews and then made summaries of the interviews. Afterwards I translated the summaries from Dutch into English.
2. Second, then the transcript of each interview was completed. The transcripts were useful to evaluate the interviews and determine the usefulness in the upcoming data analysis.
3. Third, by deleting irrelevant information which are not compelling and/or of any contribution for answering my research questions, I shrunk the transcript in search of relevance.
4. Fourth, I arranged the text into research subjects to structure them. In this case, I could relate the answers and questions per research subject.
5. Fifth, each research subject has been divided into three items. Each item consists of two to three questions. I arranged the text by inserting specific text that answers the questions.
6. Sixth, I made a summary of the text within each theme to increase readability and even more I incorporated quotes which represented perceptions and reactions of the interviewees that were illustrative and representative to address the essence of the answers.
7. Seventh, I plotted obtained results on my conceptual model within each case and

I started with a within-case analysis to gain insights of the research subjects from each case and from there plotting the obtained insights on my conceptual model. The comparison within the different cases allowed me to get familiar with the case according to Bryman et all (2007). They claim that the familiarity with the cases will help the researcher to improve the comparison of the cases. The intention of a cross case comparison is that the researcher dive deeper in the data and are not guided by their own interpretations and motivations. So, this approach creates a structure and strict analysis which enables the validity of the analysis.

For the processing and analysis of the data, I made use of a confrontation matrix which is a framework where the research subjects were organized. In this way it was possible for me to structure my analysis and interpret the information obtained from the various cases. This gives a clear overview of the different scores per company.

Here, I used the research subjects and items and scored each company on how they performed on that specific item. I used a score method by giving a minimum of + and a maximum of +++. This allowed me to make the differences and similarities visible within this benchmark.

Ultimately, I investigated several research subjects and items, and the important aspect of my research is to analyse the data and find linkages between the different research subjects. Here I could derive causal relationships between LSM, innovation capabilities and innovation conditions.

5.8.1. Comparison with literature

I find it important to compare my research findings with the available scientific literature. This deductive analysis will strengthen my findings. In this case, I focused on the research subjects organization culture en management skills.

5.8.2. Writing of the report

My motivation is to write a master thesis, worthy to scientific standards. I also used tables and figures to visualize theories and analyses. This will improve the readability of my report.

5.9 Reliability and Validity

Reliability concerns the extent to which a study is replicable and within this qualitative research this cannot be guaranteed, because within a qualitative research this is difficult to achieve by repeating the research and gaining similar outcomes according to Bryman et all (2007).

To increase the reliability I used the obtained information from one interviewee to validate the information of another interviewee, to retrieve perception gaps. I also made a transcript of each interview, made a summary of each interview, used an interview format, a pre-structured score card and I recorded each interview. This enabled me to control the retrieved data, motivations and conclusions thoroughly. I assume that the reliability was high, because I used a semi-structured interview protocol and most of the retrieved information was the result of answering these questions and when needed, I could ask in-depth questions to deepen the interview.

The retrieved data from the interviewees can be seen as subjective knowledge, because the interviewees gave their answers based on their own context, experiences and perceptions. Also, the relation between the researcher and the investigated subjects cause an independency. The researcher is part of the investigation and influences the research, thus not an objective outsider.
Like I stated earlier that qualitative research primarily concentrates on understanding and interpreting, this depends on how these findings are interpreted by the researcher based on this his views, according to Bryman et all (2007).

The validity of the research data tries to determine to which extent relations are possible between the retrieved data and the scientific literature. This is a worthy aspect of qualitative research, especially as I am executing an inductive research (Bryman et al., 2007). Furthermore, within qualitative research validity is examined by recapitulate if the conclusions made by the researcher are congruent with the underlying retrieved data.

The used concepts and definitions of LSM were established on the basis of the literature review and their content was checked within the interviewees by operationalize them in my interview protocol. To measure the content of concept properly, I determined a few underlying sub-domains and incorporated these items in my interview protocol to measure the content throughout different items.

Furthermore, I combined the experience of my observations during my internship at Rabobank HQ, with the data I retrieved within the case studies, with the knowledge I gained throughout my literature review. I combined different data sources, methods and theories to find affirmative evidence, which increased the validity of my research. So, this allowed me to apply triangulation on company, team and employee level.

5.10 Generalization

Flyvbjerg (2006) proposes that a single case study can deliver relevant insights that are generally valid for a population. So, the results within my research can apply to companies, departments or employees who are dealing with LSM in a similar context.

The generalization within this qualitative research is limited, because of the specific contextual situation the research has been conducted (Bryman et al., 2007). Thus, generalization of my research is limited outside this specific context. However, my research can contribute to a general understanding of a relatively new subject like LSM, where little literature is available. Hopefully, this research can trigger further research where the insights can be investigated further and create more generalization for different cases.

6. Results

Chapter 5 describes how the research has been executed and which research methods are used. This chapter discusses the results obtained from the empirical research. Firstly, I will give a case description of the interviewed companies, for each case a within analysis has been executed and I will also connect the gathered data with the components of my conceptual model.

Furthermore, I have combined the cases by constructing a cross case analysis. Here, I have integrated the data from each case study to visualize the results. These results are derived from the score cards of each case study, enclosed under **Appendix 3: Score card case studies.**

6.1 Case descriptions

As indicated, the research was conducted among five large companies within the specific department where LSM has been implemented. Hereunder I have summarized in **Table 6**: **Interviewed companies** the name of the company and the specific department, their date of incorporation and their facts and figures over the year 2015. These facts and figures are obtained from the annual report of each company. I also included the name, role and gender of the interviewee. This to form an overall picture of the organizational situation where the department is positioned.

Table 6: Interviewed companies

2015 Name organization	Department	Date of incorporation	Turnover	Profit	Listed	Number of employees (FTE)	Commodity market	Gender	Role
Eneco	ServiceLab	1995	2363 mln.	218 mln.	No	6.711	Yes	Woman	Portfolio manager
	Innovation & Ventures						Yes	Woman	Program manager
ING	Accelerator	1991	16.552 mln.	4.500 mln.	Yes	52.000		Man	Agile coach
Rabobank	Strategy & Innovation	1972	13.014 mln	2.200 mln.		48.125	Yes	Man	Innovation Manager
	Strategy & Innovation				No			Man	Head Innovation management
ABN AMRO	Innovation Center	1991	8.455 mln.	1.920 mln.	Yes	22.048	Yes	Man	Innovation Manager

The departments have their own market focus, but operate mostly in the Dutch market. ING and ABN AMRO are the only listed companies. The number of employees is calculated in FTE and is based on an international scale. In addition, I conclude based on the interviews and the scientific literature that the companies are active in commoditized markets, also acknowledged by the interviewees of the different companies: low margins, fierce competition, price drops, saturated market and less differentiation.

Important to address is that the interviewed companies, the banks, have realised higher turn overs and profits in 2015 in comparison with 2014, due further cost containments actions, downsizing, and better market conditions, such as an lower EURIBOR rate. Eneco's market circumstances are challenging, because the weather conditions were mild in 2015, so people did not have to consume much energy, this reduced their turnover in 2015, however their profit was stable.

In summary, eight hours of interviews yielded 45 pages of transcripts. Almost 3 hours of transcription time for every hour recorded audio. I also had to translate the text from Dutch into English, which took one hour per interview. Also, I made summaries of the six transcripts, which took me 1 hour per interview. Total, I spent approximately 39 hours conducting interviews with six interviewees (8 hours), transcribing (18 hours), translating (7 hours) and make summaries of the six transcripts (6 hours).

6.2 Within analysis ING

6.2.1 ING Company profile

Introduction
ING is the leading bank in The Netherlands who has a strong presence in Europe. They strive every day to deliver excellent service and fulfill the financial needs of their broad customer base all over the world. They have more than 52.000 employees and they are active in 40 countries. ING has a strong brand with positive recognition from customers in many countries, strong financials, omni channel distribution strategy and an international network. ING's Think Forward strategy continues to improve the customer experience and drive commercial growth. Strengthened focus on innovation with further investments in proprietary technologies and collaborations with Fintechs. ING Bank attracted EUR 8.8 billion of net
Interviewee
I conducted my interview with an Agile coach of ING The Netherlands B.V. He is responsible for the innovation process within the IT and start-up segments, the Accelerator department.
CEO Statement
"The digital banking landscape has never been more dynamic than it is today," said Ralph Hamers, CEO of ING Group. *"Customers are changing the way they bank, which requires us to be flexible and agile. Think Forward strategy has enabled to rise to this challenge and deliver a differentiating experience to more than 34 million customers around the world."*

Source: (ING website, 2016)

6.2.2 Case analysis

Their board of directors demanded another way to organise the company, this in order to be flexible and agile due their changing environment. So, ING stopped with the traditional way of innovating within their Accelerator department. This meant in general, stop intervening and letting employees innovate on an Agile way. Furthermore, ING has developed an innovation process based on the LSM principles which helps them to lower the waste and maximize the usage of resources and better respond to their customers' demands. In **Table 7: ING Research results**, I have summarized their scores based on my research.

Ultimately, the organizational structure made it possible to adopt LSM. They work in tribes, each tribe consists of eight squads, and each squad has a team of ten people at maximum. According to ING: ''This makes is possible to drill holes in the silos, to be smaller and to have an open structure, to learn fast and pivot all the time.''

ING has installed a management philosophy that managers have to be supportive; the urgency to help people every day. They removed a lot of coordination layers and coordination roles. They score ''strong'' regarding their management skills. With this in mind, ING created different processes and structures to improve the coordination between departments. So, teams have more mandate to decide and much more flexibility, and less steering committees.

They have monthly stand-ups within the different teams, where also team managers participate, so sharing and teaching has a priority in order to work efficient and maximize the output, on an agile way. Their managers adopted LSM to a great extent and they understand that LSM only can flourish when managers support entrepreneurship among employees and they encourage employees to fail and learn, is such a way that failure is praised!

They diminished bureaucracy and are able to make resources available for everyone and they their operation is lean and agile, which improves the management capability. Given the supportive management philosophy, ING has proven that ***LSM needs supportive management skills to accelerate the management capability.*** Hypothesis (H1) accepted.

''ING wants employees to experiment and learn different stuff.'' For instance, they support employees seeking new adventures, take risks and learn from their mistakes. ING encourages people to fail, they don't not only say it, they make sure that employees feel it. So, they encourage people to share their failures by giving awards for the biggest failures.

The board of directors of ING succeeded in changing the entrepreneurial behaviour by setting new norms and values within the Accelerator department. This changed the organizational culture within their tribes, resulting in a favourable condition of adapting LSM where experimentation is viewed as an important way to experiment and learn different stuff, they score strong on these items. Bringing disruptive innovations to the market to create new business models has not happened yet, therefore they score ''average'' on the item *innovation*: ''It's hard to change a proven business model.''

LSM taught how to engage employees to get out of the building and improved the autonomy and willingness to take action and responsibility. Due LSM validated learning became crucial in the innovation process to eventually create better products for their customers. In conclusion, ING has created ***an explorative culture, where LSM has sufficient traction to improve the innovation capability.*** Hypothesis (H2) accepted.

Table 7: ING Research results

Research subject	Items	Questions	ING
Lean startup management	Entrepreneurship	Idea development	+++
		Accountability	+++
	Innovation	Innovation process	+++
		Better products	+++
		Wasting resources	+++
	Management	Innovation process measurement	+++
		Coordination between departments	+++
		Process and structure changes	+++
Management Skills	Management skills	Primarly responsibilities of managers	+++
		Type of manager	+++
		Lesson learned	+++
	Shit umbrella	No external people needed	+++
		Shit umbrella role	+++
	Collaboration	Learning cycles between departments	+++
Validated learning	MVP's	Outcomes after LSM	+++
		Employee engagement	+++
	Learning cycles	Importance of validation	+++
		Failure is a lesson	+++
	Innovation	Innovative solutions	++
		Creating new business opportunities	++
Culture	Experimentation	Favourable innovation culture	+++
		Culture change due LSM	+++
		Initial culture ready for LSM	+++
	Responsibility	Employee mandates	+++
		Employee responsibilities	+++
	Development	Employee skills development	+++

6.3 Within analysis Eneco

6.3.1 Company profile Eneco

Introduction
Eneco is part of the Eneco Group, an integrated energy group of several complementary business units. The Eneco energy company provides for the daily energy needs of Dutch businesses and households. They offer energy security for two million-plus customers and provide total solutions to become fully sustainable. Eneco achieved in 2015 a turnover of EUR 2.4 billion and a profit of 144 million euros. They are an integrated energy group with more than 7,000 employees, offering comprehensive solutions for, and together with, their customers and partners. They invest in networks, onshore and offshore wind farms, solar energy projects and biomass plants from bases in the Netherlands, Belgium, the UK, France and Germany.
Interviewees
I have had two interviews within Eneco, a program manager of Eneco and she is responsible for the innovation process within Innovation and Ventures. Also, a portfolio manager and she is responsible for the innovation projects of ServiceLab. Both work at different departments within Eneco and it is interesting to seek the differences on how LSM is executed within different departments in a single company
CEO Statement
Jeroen de Haas: ''Welcome to the new world' is the new motto of Eneco Group.'' In this new world, there is only room for sustainable energy companies that provide innovative energy services and put customers first. ''Together with our customers and partners, we aim for affordable solutions that save energy and money and also enable to generate your own energy.'' ''Together with you, we will work towards a world in which everyone can generate their own sustainable energy.'' It turns out that families and businesses that generate their own energy locally end up being more conscious of their energy consumption in practice.

Source: (Eneco website, 2016)

6.3.2 Case analysis

The innovation process of Eneco consists of the LSM principles where idea development and accountability are included. In **Table 8: Eneco Research results**, I have summarized the scores of the two departments based on my research. They use LSM to verify the problem/market fit and they instigate the classic Lean Start-up phases and at any stage the business case gets more tangible, with the positive result that LSM makes sure that there are less MVP's than before. This is good, but the portfolio manager says: ''The difficult part is when a project fails, employees get the feeling that they have failed.'' Important is to energize people to move on and go to the next project.

At Innovation and Ventures, program manager says: ''Prescribing employees what to do is not the way to go.'' ''Ask employees how they overcome a certain problem is an effective way.'' In both departments there are no traditional managers anymore and managers are shit umbrellas for their teams in order to head steady on their goals. Eneco changed, to a medium degree, different processes and structures. Both interviewees say that there are no political and/or bureaucratic proportions in place.

Both departments have the same scores on the research subjects *Lean Startup Management* and *Management Skills.* Eneco has implemented LSM and are able to maximize their resource usage. Eneco created, to a medium degree, different processes and structures to fully implement LSM. They started a development program to fully grasp the LSM benefits by improving the coordination between departments. So, each month employees are taught basic skills, to retrieve more routine.

For example: ''How do teams can work better together and how to make a business case.'' They are sharing their knowledge and they steer on key metrics that ensure and guarantee efficiency through management and the maintenance of structures. So, I conclude a positive relation between Lean Startup Management and the management capability. Within these Eneco cases a positive moderating effect is established, by the excellent management skills indicating that **LSM needs supportive management skills to accelerate the management capability.** Hypothesis (H1) accepted.

At Innovation & Ventures they want to ensure continuity by adopting various business models and to remain a major player in the market. LSM is helping ServiceLab through this transition to create new and better propositions to make them able to create new services. In comparison with Innovation & Ventures, ServiceLab has a higher degree of *Validated Learning*. Making mistakes are considered differently within the two departments.

At Eneco they have a certain entrepreneurial mind and agility to use LSM to learn things when they get out of the building and develop themselves. They engaging employees to accompany the innovation process and are facilitating employees to get out of the building and to maximize their learnings. The culture within ServiceLab is the most favourable one within Eneco in terms of adapting LSM and support exploration and give people mandates to make decisions. Eventually this resulted in new business opportunities by launching better products and services. Thus in general, Eneco created **an explorative culture, where LSM has sufficient traction to improve their technology development capability.** Hypothesis (H2) accepted.

Table 8: Eneco Research results

Research subject	Items	Questions	Eneco 1	Eneco 2
Lean startup management	Entrepreneurship	Idea development	+++	+++
		Accountability	+++	+++
	Innovation	Innovation process	+++	+++
		Better products	+++	+++
		Wasting resources	+++	+++
	Management	Innovation process measurement	+++	+++
		Coordination between departments	++	++
		Process and structure changes	++	++
Management Skills	Management skills	Primarly responsibilities of managers	+++	+++
		Type of manager	+++	+++
		Lesson learned	+++	+++
	Shit umbrella	No external people needed	+++	+++
		Shit umbrella role	+++	+++
	Collaboration	Learning cycles between departments	+++	+++
Validated learning	MVP's	Outcomes after LSM	+++	+++
		Employee engagement	+++	+++
	Learning cycles	Importance of validation	+++	+++
		Failure is a lesson	++	+++
	Innovation	Innovative solutions	++	+++
		Creating new business opportunities	++	+++
Culture	Experimentation	Favourable innovation culture	++	+++
		Culture change due LSM	++	++
		Initial culture ready for LSM	++	++
	Responsibility	Employee mandates	++	++
		Employee responsibilities	+++	+++
	Development	Employee skills development	++	++

6.4 Within Analysis Rabobank

6.4.1 Company profile Rabobank

Introduction
Rabobank is part of the Rabobank Group, conditioned by its cooperative roots, the nature of Rabobank Group is characterised by strong mutual relationships. Rabobank believes that sustainable growth in prosperity and well-being requires careful nurturing of natural resources and the living environment, and it aims to contribute to this development with its activities. Rabobank respects the culture and traditions of the countries where it operates without losing sight of its own objectives and values. Rabobank Group has a top rating, awarded by the well-known international rating agencies Standard & Poor's, Moody's and Dominion Bond Rating Service. In terms of Tier 1 capital, the organisation is among the world's 25 largest financial institutions. The financial results of 2015 give us a good starting position to continue the path of success. The Rabobank Group's net profit for 2015 amounted to 2,214 million.
Interviewees
I have interviewed two employees of Rabobank Innovation Management, an innovation manager and the Head of Innovation Management. Their goal is to see market opportunities and threats and convert them into strategic plans. Innovation as a whole is used to answer to these market changes.
CEO Statement
Wiebe Draijer is dedicated to convert Rabobank into a community bank which will make a substantial contribution to the welfare and prosperity in the Netherlands and to the sustainable feeding the world. "We want to be a meaningful cooperative long-term success for members, clients, employees and societies. Rabobank wants to make a contribution to the challenges facing the Netherlands. "With Banking for Food we want to co-contribute to the sustainable feeding 9 billion people by 2050."

Source: (Rabobank website, 2016)

6.4.2 Case analysis

Looking at **Table 9: Rabobank Research results**, I see a few different scores between the two interviewees, who are working within the same department. The reason for these score differences can be imputable due their interpretations caused by personal experiences, their job types, responsibilities and information asymmetries, so further investigation was not conducted.

Their innovation process entails the steps of a transparent process and they use key metrics to determine the success rate of an idea. LSM taught them that ambiguity is important to achieve success. According to the innovation manager: ''Employees can help each other to do cool things.'' '' By sharing learnings and ask for help regarding issues employees can develop great things in weekly sprints.'' They are able to build on an agile way, but the linkage with other disciplines needed another structure. So, teams are now more connected by working in the same office and they changed the development processes. They learned that teams can flourish if they are connected physically.

In a way, Rabobank has implemented LSM and they are able to eliminate waste and focus on refining their innovation process. Furthermore, they are changing their processes and structures to adopt LSM. Within Rabobank, managers have tight schedules and the political pressure can be severe. To give an illustration: ''So, when a total department is turning, you cannot go straightforward as a team.'' ''It's difficult for a bank to create shit umbrella's. ''Managers try to be supportive and shit umbrellas for their employees, but our bank is in a transition mode, so priorities tend to shift on our roadmap.''

Based on the aforementioned, Lean Startup Management and Management Skills are developed on an average degree, despite these, LSM indeed improved the resource coordination and eliminated waste in their innovation processes and managers are supportive to adopt new ways of innovating. So, Rabobank proofs that **LSM needs to a (medium) extent, supportive management skills to accelerate the management capability.** However, these benefits could have been much greater, if *Lean Startup Management* and *Management Skills* were strongly developed, Rabobank acknowledges this as well. Hypothesis (H1) accepted.

According to the Head of innovation management they generate less MVP's, so a few ideas received funding and most of them failed completely. ''When employees don't go out, they will learn nothing. If they learn nothing, their idea will fail and with failure comes cutting off funding.'' Therefore, Rabobank sees validation as the most valuable aspect of innovation. With validation comes learning, this process enables Rabobank to internalize new market means and translate them into new products to create new business models.

According to the innovation manager: ''At Rabobank, freedom is little when ''how'' and '''what'' are fully designed.'' So, Rabobank has started a culture program where they have determined many new competences. ''Innovative entrepreneurship'' is one of them and contains that employees need to seek new opportunities for themselves and the bank and its customers to instigate growth.

However, *Culture* and *Validated Learning* are developed on an average degree and Rabobank finds ambidexterity hard to achieve. Creating an explorative setting within a corporate setting is difficult, because people don't take risks. With their innovation toolkit they have gained more willingness among employees to embrace LSM and exploration. This resulted in better products for their customers and a more explorative culture within their department. In general, Rabobank created a **relatively explorative culture, where LSM has gained sufficient traction to improve their technology development capability.** Hypothesis (H2) accepted.

Table 9: Rabobank Research results

Research subject	Items	Questions	Rabobank 1	Rabobank 2
Lean startup management	Entrepreneurship	Idea development	+++	+++
		Accountability	+++	+++
	Innovation	Innovation process	+++	+++
		Better products	+++	+++
		Wasting resources	++	+++
	Management	Innovation process measurement	+++	+++
		Coordination between departments	++	+++
		Process and structure changes	++	++
Management Skills	Management skills	Primarly responsibilities of managers	++	++
		Type of manager	++	++
		Lesson learned	+++	+++
	Shit umbrella	No external people needed	++	++
		Shit umbrella role	++	++
	Collaboration	Learning cycles between departments	+++	+++
Validated learning	MVP's	Outcomes after LSM	+++	+++
		Employee engagement	+++	+++
	Learning cycles	Importance of validation	+++	+++
		Failure is a lesson	++	++
	Innovation	Innovative solutions	++	++
		Creating new business opportunities	++	++
Culture	Experimentation	Favourable innovation culture	++	++
		Culture change due LSM	++	++
		Initial culture ready for LSM	++	++
	Responsibility	Employee mandates	++	++
		Employee responsibilities	+++	+++
	Development	Employee skills development	+++	+++

6.5 Within Analysis ABN AMRO

6.5.1 Company profile ABN AMRO

Introduction
ABN AMRO is a full-service bank with primary focus on the Netherlands and selective operations internationally. ABN AMRO's aim is to become a better bank contributing to a better world and they want to have a recognized position in sustainability by creating new prospects for the client relationships by offering the products their need to become their partner in business.   They serve retail, private and corporate banking clients based on their in-depth financial expertise and extensive knowledge of numerous industry sectors. ABN AMRO strives to put their clients' interests first in everything they do and to create long-term value for the stakeholders. The underlying net profit for full-year 2015 was EUR 1,924 million.
Interviewees
I interviewed an Innovation manager at ABN AMRO Innovation Centre. His goal is to experiment and develop new opportunities for ABN AMRO in a rapidly changing banking landscape.
CEO Statement
Gerrit Zalm aims with ABN AMRO to become a better bank contributing to a better world. "We want to have a recognized position in sustainability by visibly building sustainable client relationships by offering transparent and simply products and by having the duty of care at the heart of our operations."   *"We aim to stand out from other banks based on the quality and relevance of our advice and services." They intend to further distinguish themselves by enhancing their needs-based client segmentation and providing solutions that suit their clients' unique situations.*

Source: (ABN AMRO website, 2016)

6.5.2 Case analysis

Looking at **Table 10: ABN AMRO Research results,** ABN AMRO scores strong on the different concepts. Important to mention is that ABN AMRO is leaving their traditional way of thinking behind, within their Innovation Centre. So, their managers at ABN AMRO Innovation Centre are people who are creative, who can think out of the box, and who have great social skills and help employees to extent their knowledge and reward bravery. This was a major step for them to overcome the burden of the traditional management philosophy and the mechanical configuration. He says: ''There is still a traditional structure at ABN AMRO and the Board of Directors consists of traditional bank captains.'' So, in order to maximize our innovations, they hired external managers to create independency by avoiding hierarchy and politics and we retrieve new knowledge to innovate with impact." They score on this item ''weak'' because of the political and hierarchical proportions within their company.

They now work with multi-disciplinary teams, where employees from different departments are merged to a development team. So, every team member has the same destination and is bonded by that same goal. Interesting is that they created an ''plastic bubble'' within their department, so no one can interfere and on the other hand, their prototypes cannot harm the existing business.' ' Their managers have the dedication to achieve their goals by experimenting and making prototypes for incremental innovations.

These managers are capable of shielding their teams for shit and have the authority to say ''no'' to projects.'' Importantly, employees are now depending on each other instead of doing a little part of the puzzle. Their management made sure that these teams are agile and retrieved better coordination by installing new processes and structures, which results in better time management and material handling. Thus, ABN AMRO is providing evidence that *LSM needs supportive management skills to accelerate the management capability.* Hypothesis (H1) accepted.

ABN AMRO emphasizes that employees need to overstep their boundaries and learn as much they can in a short period of time. He says: ''This means that employees will make mistakes and most of the time fail.'' ''Within failure comes learning.'' ''We much look at the value of the learnings, not at the downsize of failure. '' For instance, they select their focus groups thoroughly and then perform their validation processes. They want to learn as much as possible from their clients, to align better to their needs but also see other opportunities. They have customers who are willing to help them to improve their products. They see co-creation as an important way to help their customers and to maximize their learnings.

They are very keen on dismissing ideas or concepts. So, they have less MVP's and those MVP's which are successful are really a few. At the Innovation Centre their culture can defined as an inspiring environment where freedom and creativity is very important. These are important factors to start with innovation and have employees energized.

Their culture changed over time, because they working closely together with startups at the Innovation Centre using LSM concepts to define new means to the market. ABN AMRO has created **an explorative culture, where LSM has sufficient traction to improve their technology development capability.** Hypothesis (H2) accepted.

Table 10: ABN AMRO Research results

Research subject	Items	Questions	ABN AMRO
Lean startup management	Entrepreneurship	Idea development	+++
		Accountability	+++
	Innovation	Innovation process	+++
		Better products	+++
		Wasting resources	+++
	Management	Innovation process measurement	+++
		Coordination between departments	+++
		Process and structure changes	+++
Management Skills	Management skills	Primarly responsibilities of managers	+++
		Type of manager	+++
		Lesson learned	+++
	Shit umbrella	No external people needed	+
		Shit umbrella role	+++
	Collaboration	Learning cycles between departments	+++
Validated learning	MVP's	Outcomes after LSM	+++
		Employee engagement	+++
	Learning cycles	Importance of validation	+++
		Failure is a lesson	+++
	Innovation	Innovative solutions	++
		Creating new business opportunities	++
Culture	Experimentation	Favourable innovation culture	+++
		Culture change due LSM	++
		Initial culture ready for LSM	++
	Responsibility	Employee mandates	+++
		Employee responsibilities	+++
	Development	Employee skills development	+++

6.6 Cross Case Analysis

In this section the cases will be analysed on the basis of a cross-case analysis. Hereunder I will operationalize my research results and plot them in 6.6.1 on my conceptual model. The six within analyses are combined together in a table, see hereunder **Table 11: Cross Case Analysis**, in a way that differences can be made clearly. The differences are analysed within each research subject and supported by quotations of the interviewees.

Through this cross case analysis there should be a clear understanding whether the supported propositions drawn from the literature and by the data from this research are applicable and finally will be followed by finding similarities and differences to generalize and derive conclusions within the multiple case studies in chapter 7.

Table 11: Cross Case Analysis

Research subject	Items	Questions	ING	Eneco 1	Eneco 2	Rabobank 1	Rabobank 2	ABN AMRO
Lean startup management	Entrepreneurship	Idea development	+++	+++	+++	+++	+++	+++
		Accountability	+++	+++	+++	+++	+++	+++
	Innovation	Innovation process	+++	+++	+++	+++	+++	+++
		Better products	+++	+++	+++	+++	+++	+++
		Wasting resources	+++	+++	+++	++	+++	+++
	Management	Innovation process measurement	+++	+++	+++	+++	+++	+++
		Coordination between departments	+++	++	++	++	+++	+++
		Process and structure changes	+++	++	++	++	++	+++
Management Skills	Management skills	Primarly responsibilities of managers	+++	+++	+++	++	++	+++
		Type of manager	+++	+++	+++	++	++	+++
		Lesson learned	+++	+++	+++	+++	+++	+++
	Shit umbrella	No external people needed	+++	+++	+++	++	++	+
		Shit umbrella role	+++	+++	+++	++	++	+++
	Collaboration	Learning cycles between departments	+++	+++	+++	+++	+++	+++
Validated learning	MVP's	Outcomes after LSM	+++	+++	+++	+++	+++	+++
		Employee engagement	+++	+++	+++	+++	+++	+++
	Learning cycles	Importance of validation	+++	+++	+++	+++	+++	+++
		Failure is a lesson	+++	++	+++	++	++	+++
	Innovation	Innovative solutions	++	++	+++	++	++	++
		Creating new business opportunities	++	++	+++	++	++	++
Culture	Experimentation	Favourable innovation culture	+++	++	+++	++	++	+++
		Culture change due LSM	+++	++	++	++	++	++
		Initial culture ready for LSM	+++	++	++	++	++	++
	Responsibility	Employee mandates	+++	++	++	++	++	+++
		Employee responsibilities	+++	+++	+++	+++	+++	+++
	Development	Employee skills development	+++	++	++	+++	+++	+++

6.6.1 Conceptual framework testing

H1: LSM needs supportive management skills to accelerate the management capability.

All the interviewed companies use an innovation process based on the LSM principles where idea development and accountability are included. The companies created, from a medium to high degree, different processes and structures to fully implement LSM and work on an agile way.

In particular, ING and ABN AMRO have made great changes to adopt LSM thoroughly in their departments and therefore score strong on *Lean Startup Management*. This results in agility, creating better coordination between departments, better time management and material handling. Rabobank and Eneco have implemented LSM and still have to work on the coordination between departments and the process and structure changes, this is beneficial to fully grasp the LSM benefits. They operate now on a medium level.

ING, Eneco and ABN AMRO score strong on the *Managerial Skills*. ING beliefs that supportive leadership is important, the urgency to help people every day. Also, ING claims that there are no traditional leaders anymore. ''A leader protects the teams by setting clear priorities and hold steady on that course, a shit umbrella.'' ''No intervening is possible then. '' However, ABN AMRO makes use of external coaches to help them innovate according to LSM principles within their Innovation Centre. There is still a traditional structure at ABN AMRO where bureaucratic layers and hierarchy still are in place. ABN AMRO only scores weak on this particular item. By contrast, Rabobank has to medium extent supportive managers in place and is not able to provide a strong shit umbrella position, due their transition phase.

The management capability makes it possible that technological solutions can be shaped and guided to operate smoothly. It entails the ability to transform potential technological solutions and innovations into operational activities. Management has to coordinate the procedures, processes, agreements and resources in order to operate efficiently (Whitley, 1989). In general, LSM enabled the companies to reduce their waste and improve the transformation of technological solutions to operate smoothly. Also, LSM helps increasing efficiency by eliminating waste and maximize the usage of resources by constantly prioritizing and use key metrics.

The literature (Ling, 2002) claims that support from managers is essential for LSM as an innovation strategy, where LSM only can flourish when managers support entrepreneurship among employees and encourage employees to fail and learn, make resources available and diminish bureaucracy. So, there is a positive relation between LSM and the Management Capability. So, supportive management skills have a positive moderating effect on LSM in order to accelerate the management capability. In these multiple cases a positive moderating effect is established, because supportive management skills are needed for the adoption of the LSM within these companies, indicating an acceptance of the hypothesis.

H2: In an explorative culture, LSM will have sufficient traction to improve the technology development capability.

The concepts Validated Learning and Culture are harder to achieve within the companies, this can be concluded, because within these concepts there are more ++, instead of +++ in the previous concepts.

All the companies conclude that they have less MVP's after using LSM. Ries (2011) defines a MVP as a future product. With this MVP companies can start the experiment and they can use validated learning to retrieve and engage customer feedback, which again have to be validated, eventually creating a product costumers want to buy. Eventually the best ideas will survive and Eneco emphasizes that it sometime hurts to kill ideas. The amount of learnings is therefore essential, to use resources and achieve efficiency of the value creating activities. Only ServiceLab of Eneco was able to create new business opportunities and innovative solutions to the market.

With learning comes failure. Within ING they support their employees to seek new adventures and fail. ING claims the most learning will be achieved with failure. So, they praise the biggest failure within their department. At ServiceLab of Eneco and ABN AMRO they have the same mind-set to activate employees to learn. Therefore they score strong on this item. In contrast, at Innovation & Ventures of Eneco this item scores average, an explanation is that ServiceLab needs to engage people to learn, because as they are constantly seeking for new business models, where the investments and uncertainties are higher than Innovation and Ventures, where incremental innovations are more common.

In general, the cultures within the companies were able to adopt from a medium extent the LSM principles. The changing the organization culture was essential, according to ING. Rabobank specifies that the freedom is little when ''how'' and '''what'' are fully designed. To strive for exploration employees have to think different, because people don't take risks easily. Andriopoulos (2001)

prescribes that innovation is possible by supporting entrepreneurship and enable employees to learn and fail without consequences. In this case, the culture within ING is most favourable in terms of adapting LSM and support exploration and gives people mandates to make decisions. Innovation can emerge within a progressive environment where exploration and creativity are supported and can be successfully exploited.

The companies have an organizational culture, this led to creating (incremental) innovations, better products, new business opportunities and less MVP's. Validated learning has a sufficient traction on the technology development capability. This ability is essential to translate and produce technological solutions by creating new production methods and processes. LSM encourages companies to use validated learning to develop new products customers want, thus improving the innovation capability.

6.7 New Insights

Based on the interviews, I retrieved new insights that activated me to research these insights to gain more understanding regarding these concepts. Hereunder, I will elaborate on these three concepts:
1. Engagement
2. Culture change
3. Servitization

In order to retrieve my empirical data, I contacted the innovation Manager of Rabobank Innovation Management and the innovation manager of ABN AMRO Innovation Centre by phone. The retrieved empirical data can be found in ***Appendix 4: Empirical data new insights***.

6.7.1 Engagement

Eneco uses LSM to verify the problem/market fit and they instigate the classic Lean Start-up phases and at any stage the business case gets more tangible, with the positive result that LSM makes sure that there are less MVP's than before. This is good, but the portfolio manager says: ''The difficult part is when a project fails, employees get the feeling that they have failed.'' The question that comes up is: ***''How do you engage people to go to the next project, after a failure?''***

In this case I contacted ABN AMRO, because ABN AMRO scores strong on the items *Employee Engagement* and *Failure is a lesson*. See hereunder, Table **12: Engagement**.

Table 12: Engagement

Validated learning	MVP's	Outcomes after LSM	+++	+++	+++	+++	+++	+++
		Employee engagement	+++	+++	+++	+++	+++	+++
	Learning cycles	Importance of validation	+++	+++	+++	+++	+++	+++
		Failure is a lesson	+++	++	+++	++	++	+++
	Innovation	Innovative solutions	++	++	+++	++	++	++
		Creating new business opportunities	++	++	+++	++	++	++

When a project fails, this feeling is also painful for the teams who have ''failed'' for their beliefs and hard work, especially when the failure is not foreseen. This doesn't motivate employees to start with a new project. ABN AMRO always looks at mistakes as lessons. They conclude that employees fail and learn lots of interesting things. ''The key is to emphasize the good aspects of failures.'' They emphasize that employees need to learn from mistakes as soon as possible to prevent wasting more resources.

In order to *avoid* surprises which lead to failure, like the described situation here above, they make use of Kanban charts. This proved to be an excellent way to start improvements, identify problem areas, bottlenecks and required time to finish a project.

So, teams can see in advance the complexity of a project. He says: *''In the occasion that our people are feeling down after a project has failed, this occurs in situations where lots of time is invested and the failure comes as a surprise because they do not saw the bottlenecks. With the Kanban charts they have a perfect tool to measure these uncertain parameters.''*

When people have failed they can be engaged relatively easy to go to their next project. *''Failing is important to learn stuff''* and *''When people feel that failing is learning, they will have a more positive association with failing.''* At ABN AMRO they are goal orientated. Their roadmap consists of several projects that will contribute on reaching a certain goal. Thus, teams are enabled to reach their goal by executing several projects. The projects are tools for realizing their goal. So, the risks are more spread over different projects. Also, they have the perfect persons getting out of the building who can deal properly with failure.

6.7.2 Culture change

During my internship, I was able to experience the LSM phases from assumption testing to building an MVP and I followed Growth Hacking courses to internalise more knowledge. I realised that within a startup there is less hierarchy and prescribing activities. There is lots of freedom, creativity and many opportunities to fail and learn, completely the opposite culture within the banking industry. I experienced the same culture within ING when I conducted my interview.

The reason for the culture change within ING is that the board of directors of ING demanded another way to organise the company, this in order to be flexible and agile due their changing environment. So, ING stopped with the traditional way of innovating within their Accelerator department. This meant in general, stop intervening and letting employees innovate on an Agile way. Leadership is important to change the culture (Schein, 2004). Support from managers is essential within a company want to use Agile or LSM.

So, I interviewed the innovation Manager of Rabobank Innovation Management and the innovation manager of the ABN AMRO Innovation Centre by telephone regarding this concept, the culture change. The main question I formulated was: ***"On which management level the decision was made to use LSM?"***

Innovation manager*: "LSM showed huge impact within different companies, mainly the startup scene.'' ''So, Rabobank Innovation Management wanted to change their current innovation process by adopting the LSM principles.''* The Board of Directors has a normative, traditional view how to innovate within a bank. The Board of Directors first want to see evidence if LSM works at Rabobank Innovation, before declaring that the whole IT department have to work with LSM.

Eventually, the implementation of LSM was decided by the Head of Rabobank Innovation Management and he has 12 months to proof the benefits of LSM as an experiment. The first benefits using LSM are visible: Employees are showing explorative behaviour, structures and processes have changed and they are able to develop better products.

However, not every department is working with LSM, only Innovation Management. Now, Innovation Management is developing roadshows to promote LSM and coach different IT teams how to use LSM. The innovation manager says: *''Everybody likes the LSM principles during the roadshows, but there is no urgency within the IT teams to use LSM.''* He motivates: *"In a cultural setting which has been maintained for years, it's really hard to change the culture.'' ''Especially when employees are told what to do, so as long as the Board of Directors is not prescribing managers and their departments to work with LSM, they won't do it.''*

Within ABN AMRO, this situation is different. He declared that LSM is top priority within their innovation teams. He says: *''We want to make impact with our innovations for our clients, therefore we have to choose other strategies to reach this goal.''* He says that LSM gained lots of interest by their Board of Directors. Changing their innovation process was important to gain quick results. They knew that the world is changing and other capabilities are needed. They realised that they don't have the sufficient human capital nor the knowledge to steer innovation with immediate effect. Thus, they assembled external parties to help them.

He says: *''Soon after LSM the processes changed and during the change we experienced that entrepreneurship and validated learning became more important.''* *''Then we came to realization that some people were blocking the progress.''* So, they hired people who embrace innovation and had the right competences. Now, they have combined external people (their numbers are decreasing) and capable, innovation minded employees.

Their Board of Directors introduced LSM to all the departments within Innovation & Strategy. With the results that traditional banking managers and employees left or were asked to leave due their lack of competence and/or knowledge and a great change of their culture; new values and norms are now in place. So, in **Figure 6: Decision Making Unit**, I have made it visual where the decision making unit regarding LSM is positioned within Rabobank and ABN AMRO (the orange arrow) and its organizational impact by highlighting the involved departments in ''green''.

Figure 8: Decision Making Unit
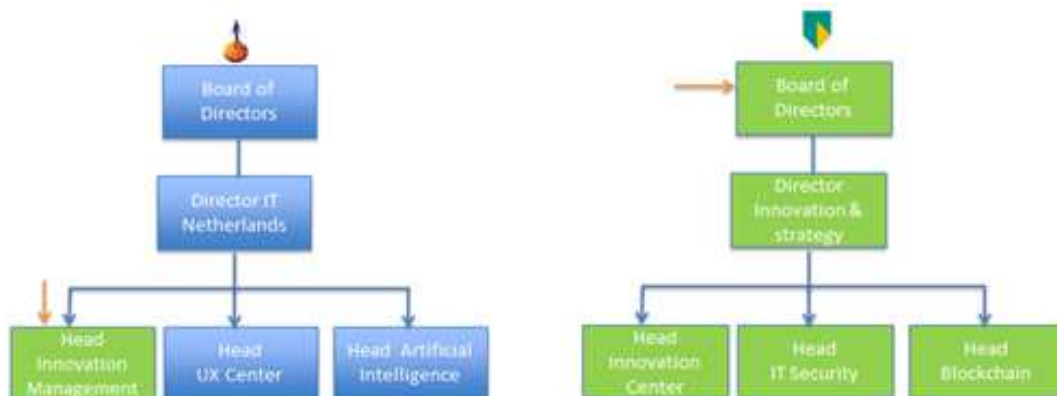
Schein (2004) claims that the organizational culture can be changed, where he sees culture as one of the most strong and stable forces within a company. Management can change values, norms and processes, which eventually will change the culture, this conclusion is supported by Damanpour and Schneider (2006). The organization culture influences the performance and therefore the results of a company. The organization culture can be described as the ''mindset'' of the company. Culture consists of values, norms, symbols, processes and rituals.

The conclusions I can derive from this observation and the theory is that:
1. The higher the decision making unit is positioned within a company, preferably top management, the more impact LSM has and eventually change the culture, this a **top-down approach**.
2. Based on Figure 6, Ries (2011) proposes that defining new processes will change the culture, LSM has proved his proposition. In the examples of ING and ABN AMRO it's evident that their culture changed by supporting entrepreneurship and failure. Now employees are involved and in charge, where this can be seen as a **bottom-up approach**.
3. Important management skills are: (A) to define weaknesses of company which can block the economic impact. By seeking resources and develop strategies that will cover this gap, companies can realise their strategic goals, like ABN AMRO did by hiring external parties. (B) Important to

mention is that management need to put their ego aside and let other people take charge; the wellbeing of the company is more valuable a person's ego.

4. The managers and persons working within these innovation departments are not traditional bankers, these people have backgrounds within the IT, Strategy, Development and Design industry.

6.7.3 Servitization

The interviewed companies are operating in a changing environment, where there products are becoming more commoditized and prices and margins are beginning to shrink. These companies are associated with red ocean companies. The companies are constantly trying to gain more market share than their competitors. The industries wherein these companies operate are crowded as products become commodities and differentiation becomes low between the different providers. This resulted in prices drops and thin margins.

This situation causes **uncertainty**, because these companies want to know how they can stay profitable the next years. Here plays strategy formulation a central role, to determine a blue ocean strategy, where market players are exploring new ways to expand their business outside their existing market. This makes it possible to find new opportunities and become more successful.

Competitive motivations suggest these companies view their products as their primary source of income and with adding services as a secondary source of income they can form an important element of a differentiation strategy (Baines and Lightfoot, 2014). For example, Eneco only focused on their energy and gas propositions and they found it increasingly difficult to differentiate their tangible products alone, with products becoming more commodities and customers generate their own energy, they felt the urgency to change their business model by 'servitization'. Servitization as business strategy means that a company is searching for ways to achieve a competitive advantage.

In this case, Eneco has started with servitization by launching TOON. They now offer a smart thermostat, which consumers can operate with their smartphone. TOON gives insight in energy consumption and can help to lower the energy consumption by identifying appliances with high energy consumptions.

Eneco used servitization as an important strategic driver for their innovation. According to Baines and Lightfoot (2014) companies can "servitize" their offerings and develop value propositions where loyalty and profit go hand in hand.

In this example LSM proofed to be beneficial for Eneco by creating a MVP and retrieving inputs from future clients in order to refine TOON. The goal of Eneco was to determine who the future clients of TOON are. In this case LSM helped Eneco to validate their assumptions in an uncertain environment, eventually to create a new business model based on servitization with TOON.

6.8 Implications conceptual model

Due the conclusions I derived from my new insights I need to change my initial conceptual model on three places in **Figure 7: Implications conceptual model**:

Figure 9: Implications conceptual model
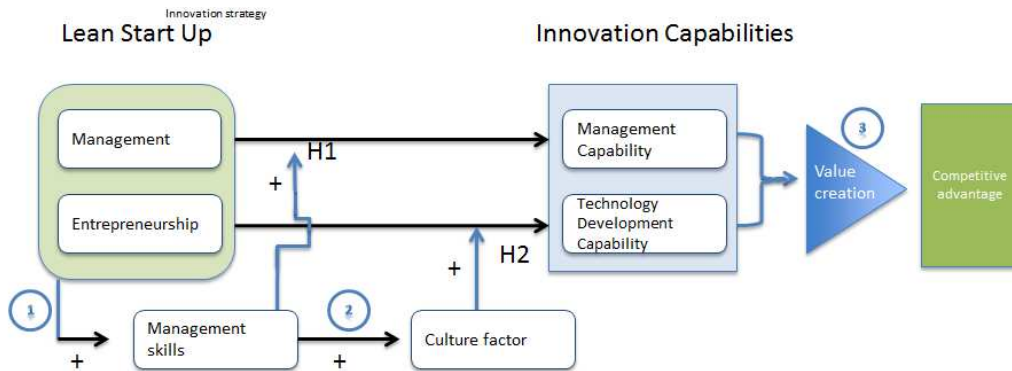
1. Adopting LSM means a different innovation strategy. The principles associating with LSM taught managers to develop different skills in order to learn faster and become lean. LSM has a positive, effect on *Management Skills*.

2. Culture consists of values, norms, symbols and rituals. Schein (2004) claims that the organizational culture can be changed. Changing the organizational culture can be done by setting new values that will eventually influence the norms. Managers have the ability to change the organizational culture by functioning as guidance for employees. By setting new values and norms, so employees know which behaviour is desirable. Therefore a positive effect is established between *Management Skills* and *Culture factor*.

3. LSM is beneficial when companies want to develop new products and services and have to coop with uncertainty. With validated learning companies can test their assumptions, such as validating product innovations and servitizations to increase a company's innovation capability. With the result to learn faster than the competition and create sustainable value propositions. Hopefully this can lead to generate new business models, improving customer loyalty, profits and gaining a competitive advantage.

6.9 Summary research results

In previous sections, I have analyzed the empirical data and discussed and plotted the results with my conceptual model. In this section I will summarize the different factors, positive and negative, which are improving or blocking each research subject, and I propose the positive results when specific factors are improving a research subject, see hereunder **T able 13: Summary research results**:

Table 13: Summary research results

Research subject	Positive factors	Negative factors	Results
Lean startup management	+Provide an innovation process +Clear instructions to sharpen their idea	-Some guidelines will not improve idea's and the process becomes fuzzy	=People know the KPI's and the guidelines, so, better measurement tooling.
	+ A detailed innovation process where performance is measured, gate after gate	-Giving funds up front will damage the measurement and control functions	=Evaluation and funding are integrated where shorter product development cycles are created.
	+Installing key metrics within the innovation process	-Using vanity metrics	=This improves the resource usage and eliminates waste
	Change both: structures and processes	Unclear processes	=Coordination and alignment will become more efficient between departments.
Management Skills	+Support entrepreneurship +Urgency to help employees	-Traditional, prescribing managers -Big egos	=More support and willingness to learn and fail will improve.
	+Creating a bubble around the department	-Constantly shifting and setting new courses.	=Hold steady, by eliminating bureaucracy and political pressure.
	+Scrum wise standups +Develop a trustworthy environment	-Sharing failure is perceived as an embarrassment	=Observations and dialogues are important aspects to learn, to pivot, to be agile and strengthen learning capacity.
Validated learning	+Create space and engage employees to get out the building	-Trying to solve problems within the same four walls.	=This will result in new ideas which can lead to new MVP's.
	+Engage validated learning within a team +Propose failure as learning	-Not engage single feedback loops	=Validation leads to creating feedback loop mitigate market risks and prevents waste, ultimately to develop better products.
	+Involve customers in the innovation process.	-Check only once the customers opinion	=Customers will tell what they want, so people can build it. Than validate each iteration to build a better product.
Culture	+Create an explorative environment	-LSM doesn't work in existing business	=By employees for failure will motivate others to copy that behaviour. This will instigate exploration.
	+Give mandates and autonomy +Develop the specific skills of employees	-No mandates and low autonomy	=Mandates will enforce employees to think about their actions and will increase their buy in to take responsibilities.
	+Start a development program +Structure team composition and trust	-Individual training	=Actions to improve their skills will lead to confidence. Team training will increase productivity, trust and pleasure.
Engagement	+ Kanban charts to foresee unpleasant surprises +Enrol employees in different projects	-Enrol employees in single projects	=Kanban charts structure and change courses. Working within different projects will improve knowledge and split the risk failure.
	+Top management needs to take action +Change the values, norms and processes +Contracting external parties	-Telling employees what to do	=The higher the decision making unit is positioned within a company, the more impact LSM has and eventually change the culture, even more when processes are changed. Overcome pride and find external parties to improve the organizational performance.
Servitization	+Develop a blue ocean strategy +Provide services	-Not using LSM as innovation strategy	=LSM is used in conditions of extreme uncertainty. LSM helps companies to find new business models.

7. Conclusions, discussion and recommendations

This chapter will contain the conclusions and the discussion regarding the gathered data. Furthermore, the contributions to the theory, recommendations and the management implications.

7.1 Conclusion

I conducted this research in order to answer my problem definition: '' **What is the effect of the Lean Startup Methodology on large companies' innovation capabilities?''** This research also provides insight in the moderating role of the innovation conditions companies are exposed to.

Hypotheses H1 has the following proposition: **LSM needs supportive management skills to accelerate the management capability.** This hypothesis is accepted. The LSM concepts are adapted to a high extend, which leads to improve the transformation of technological solutions. LSM taught how to use key metrics to define success, therefore the companies were able to determine factors that eliminated waste and achieved better resource usage. Ultimately LSM strengthens the management capability.

The available management skills within these companies are described in this research as an innovation condition. In conclusion, the managers were able to be shit umbrellas and felt the urgency to help people to achieve more learnings. Management made it possible to create an entrepreneurial environment and initiated scrum wise standups to improve the learning capacity. Ideally, changing the structure and processes resulted in higher adoption of LSM, where the companies retrieved agility, creating better coordination between departments, better time management and material handling.

The second hypothesis is H2: **In an explorative culture, LSM will have sufficient traction to improve the technology development capability.** This hypothesis is also accepted. In general, the companies have proven to possess an explorative culture. This was made possible by changing the values, which can be done by installing new structures, processes, rituals and symbols.

Management have shown to possess the ability to change the organizational culture by functioning as guidance for employees. By setting new norms, so employees know which behaviour is desirable. Other findings were that the higher the decision making unit is positioned within a company, preferably *top management*, the more impact LSM has within an organization to make a cultural change.

To a lesser extent, the companies gave more mandates and autonomy to employees to retrieve more goodwill so they took more responsibilities. Changing the culture was necessary to create an explorative and agile company, where creativity and ambiguity is supported to build better products.

Within LSM validated learning is all about how to build a sustainable business. The technology development capability is the outcome of the learning cycle companies follow to internalize knowledge and to transform into innovations. For instance, internalize new knowledge led to creating incremental innovations, better products, new products and services. Validated learning has a sufficient traction on the technology development capability.

The most learning will be achieved with failure. So, some companies praise the biggest failure. This engages people to learn and fail. Personal failure can be a burden, so companies are using methods to fail fast and let employees work in different teams to spread this risk. Even so, LSM is most suitable to test assumptions in an uncertain environment, where companies are searching for new business models, such as servitization. Where the transition from products to services is difficult, however LSM can help to learn faster than the competition and create value for the customer to achieve a competitive advantage.

7.2 Discussion

To gain insight in LSM and how that it can enable the innovation capabilities of large companies in commoditized industries is the central part of this research. The scientific literature regarding innovation conditions has been applied to form an opinion which favourable innovation conditions can improve the adoption of LSM.

Because a similar research has not previously been conducted, I chose to use an explorative research were I would be able to understand and interpret the processes, occurrences and developments within these research subjects. Deriving assumptions throughout my literature review and investigated them using a qualitative research in the form of semi-structured interviews. The research results were in line with my expectations. On the other hand, I retrieved new insights when it comes to implement LSM and the personal experiences of my interviewees doing so. These new findings have enriched my research and engaged me to research these findings even further.

This research proves that LSM improved the innovation capabilities of the companies. According to Blank (2013) getting innovative doesn't necessarily mean to develop disruptive innovations, it's more creating a methodology around the processes and procedures, when one develops a product or service. The research results are in line with the literature of Blank (2013), where he claims that Agile development goes hand-in-hand with customer development. For example, the interviewed companies were able to use agile development to lower the waste of time and resources to develop an MVP. Based on the built MVP, feedback loops were initiated to develop products by iterations to respond better to their customers' demands.

The companies use the Business Model Canvas of Osterwalder (2010) to sketch out their hypotheses. However, the vast majority of the interviewed companies were not able to create new business models. Using the blue oceans strategies by Chan Kim and Mauborgne (2015) haven't covered much ground. The companies haven't expanded their business outside their existing industries.

Despite their current state, the companies acknowledge the fact that commoditization will be fatal and new activities have to be developed. Still, they have put much effort in developing incremental stuff to increase the value proposition of their customers, eventually this will leads to economic impact and customer satisfaction. This research is a snapshot of the current state and use of LSM within the companies. I wasn't expecting much difference between the companies regarding the LSM adoption level, on the contrary, this research shows that some companies have a big lead.

From the scientific literature, Calantone et al (2002) have investigated the causal relation between organizational learning and innovation. They claim that a positive relationship has been obtained between organizational learning and company innovation. This research also supports their finding. The companies are able to internalize new knowledge, which allows them to create incremental innovations, better products, new products and services.

O 'Cass et al (2009) propose that companies that can internalise knowledge efficiently, thus have improved learning skills, are better in adapting to market changes by developing faster and cheaper than competitors. This learning ability can help companies to achieve a competitive advantage. Ries (2011) endorses this proposition, by stating that learning faster than anyone else is the only to succeed. I have investigated factors that are necessary to improve the learning skills, however this research has not shed a light to which extent this skill was developed to speak of a competitive advantage.

7.3 Management Implications

Based on this research and the derived conclusion LSM has proven to lower risks concerning starting a company or launching a new product. This methodology emphasizes experimentation over planning, learning over assuming, measuring over intuition and fail fast over fail slow. Even though the realisation of this methodology within large companies can be difficult in contrast with startups. This can be accomplished by proving practitioners with empirical findings that constructs of LSM are beneficial to examine and use in an innovation process.

Ries has developed LMS as a straight forward approach where iteration and working towards an MVP have resulted in developing learning cycles instead of gaining more profit. This methodology it can be assumed that the classical LSM phases can be understood quite easy and thus can be adopted by practitioners. This emerged methodology and its concepts can offer good guidance for those companies who want to set the desired parameters to specify LSM according to their needs.

Employees must be able to make mistakes and learn from them. Instead of getting retributions, they must get praised for the mistakes they make in order to make the organization learn and turn. This means that managers must pay good attention to internal communication and involving employees from different departments at weekly standups. In addition, autonomy and a low degree of hierarchy are of great importance. Employees should not experience restrictive processes and companies should avoid strong control mechanisms. Procedures should be designed, so that they offer employees freedom and engagement to deploy entrepreneurial activities.

LSM offers different phases to structure this process, furthermore managers will learn to become supportive and will determine requirements and resource planning within each phase. Applying the LSM phases will result in an efficient resource usage and will lower the waste by introducing an innovation process. The next stages will be become difficult. Changing a culture will take some time and effort to make impact. Managers should create an entrepreneurial culture where exploration is supported.

7.4 Limitations and further research

I explored the manifestation of LSM within commoditized industries and the findings and conclusions are reflections of the current situation and only applicable within the case analysis. Also, the generalization within qualitative researches is limited, because of the specific contextual situation the research has been conducted (Bryman et al., 2007). Because of this specific contextual situation, the results of this research are also limited for extrapolating for other industries.

This research never had the intention to present conclusions that are applicable on a larger scale. Because there is little scientific data available of LSM, the results of this qualitative research is a first step is to get familiar with LSM and its concepts. This research represents a profound way how LSM has manifested and which activities are needed for the implementation. The outcomes of this research are presented to trigger future research on a larger scale and within different industries.

Due to the short time frame and from a cost perspective I focused on four companies. Because I am only conducting interviews among large companies who have executed LSM, the retrieved data is biased towards their specific experiences and industry. Thus, generalization of my research is limited outside this specific context. However, my research can contribute to a general understanding of a relatively

new subject like LSM, where little literature is available. Hopefully, this research can trigger future research where the insights can be investigated further and create more generalization.

The complexity of the innovation capabilities are taken in consideration, so I tried to isolate and research only two innovation capabilities. The linkages between the research subjects can be more complex, than I propose in my framework. So, linkages can be non-linear, not have causal explanations and therefore not be predictable in a complex system. I propose to have searched for linear linkages and find causal explanations, semantic relationships, in a way generalization is possible to be made between these cases. For future research I propose to investigate all four innovation capabilities, this would enhance the description of the complexity of the system.

I have taken into consideration that after all, a description or declaration of a complex system is necessarily a reduction, because there is no perfect description of a complex system (Cilliers, 2008). Undesirable reduction is required to make this research possible within the limited timeframe. To comprehend the complex system, I used multiple descriptions and explanations. Together, these cases will still not be sufficient, but they will have fewer defects than one case. This is also important to address as a limitation in this research and where opportunities are to execute further research.

For future research I propose that innovation strategies like design thinking and LSM can be compared to each other. There where design thinking concentrates on human interactions, LSM concentrates on the process. Especially, within this research it would have been beneficial to investigate which innovation strategy is most suitable for changing an organizational culture.

I believe that the used theory of Ries is can be seen as one-sided. I haven't questioned his opinions and conclusions in order to critically evaluate his propositions within this thesis. I assumed, given his role models, his experience as an entrepreneur, the perfection of his methodology, numerous LSM practitioners, that his propositions have scientific ground and are empirically proven.

I used convenience sampling to collect easy and fast interviewees. This resulted in conducting my empirical data, however a limitation is that it my sample is not representative for the total population of large companies in commoditized companies.

For future research I propose that focusing on the current and needed capabilities can shed light what companies need to do in order to improve their innovation capability. This could lead to benchmarking and determining what the companies' s potential is and derive goals and strategies.

Within this research I couldn't retrieve much scientific data, therefore I was only able to develop an interview protocol after reading the book of Eric Ries, the few scientific articles and talk to LSM coaches. I gained new knowledge and went from learnings to learnings in order to pivot and to change my interview protocol.

Aiming to fully grasp the LSM concepts and adjusting my questions to LSM jargon. However, the questions proposed in my interview protocol were not tested within other researches or used by other researchers. The possibility is that my questions were not fully comprehended or interpreted differently by the interviewees than proposed. I tried to minimize these hazards by asking guidance from my co-reader regarding the build-up of my interview protocol and performing a pre-test with an interviewee concerning the build-up and the content of my interview protocol.

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Appendix 1: Business Model Canvas

The Business Model Canvas

Designed for:
Designed by:
On:
Iteration:

Key Partners
Who are our Key Partners?
Who are our key suppliers?
Which Key Resources are we acquiring from partners?
Which Key Activities do partners perform?

MOTIVATIONS FOR PARTNERSHIPS
Optimization and economy
Reduction of risk and uncertainty
Acquisition of particular resources and activities

Key Activities
What Key Activities do our Value Propositions require?
Our Distribution Channels?
Customer Relationships?
Revenue streams?

CATEGORIES
Production
Problem Solving
Platform/Network

Key Resources
What Key Resources do our Value Propositions require?
Our Distribution Channels? Customer Relationships?
Revenue Streams?

TYPES OF RESOURCES
Physical
Intellectual (brand patents, copyrights, data)
Human
Financial

Value Propositions
What value do we deliver to the customer?
Which one of our customer's problems are we helping to solve?
What bundles of products and services are we offering to each Customer Segment?
Which customer needs are we satisfying?

CHARACTERISTICS
Newness
Performance
Customization
"Getting the Job Done"
Design
Brand/Status
Price
Cost Reduction
Risk Reduction
Accessibility
Convenience/Usability

Customer Relationships
What type of relationship does each of our Customer Segments expect us to establish and maintain with them?
Which ones have we established?
How are they integrated with the rest of our business model?
How costly are they?

EXAMPLES
Personal assistance
Dedicated Personal Assistance
Self-Service
Automated Services
Communities
Co-creation

Channels
Through which Channels do our Customer Segments want to be reached?
How are we reaching them now?
How are our Channels integrated?
Which ones work best?
Which ones are most cost-efficient?
How are we integrating them with customer routines?

CHANNEL PHASES
1. Awareness
How do we raise awareness about our company's products and services?
2. Evaluation
How do we help customers evaluate our organization's Value Proposition?
3. Purchase
How do we allow customers to purchase specific products and services?
4. Delivery
How do we deliver a Value Proposition to customers?
5. After sales
How do we provide post-purchase customer support?

Customer Segments
For whom are we creating value?
Who are our most important customers?

Mass Market
Niche Market
Segmented
Diversified
Multi-sided Platform

Cost Structure
What are the most important costs inherent in our business model?
Which Key Resources are most expensive?
Which Key Activities are most expensive?

IS YOUR BUSINESS MORE
Cost Driven (leanest cost structure, low price value proposition, maximum automation, extensive outsourcing)
Value Driven (focused on value creation, premium value proposition)

SAMPLE CHARACTERISTICS
Fixed Costs (salaries, rents, utilities)
Variable costs
Economies of scale
Economies of scope

Revenue Streams
For what value are our customers really willing to pay?
For what do they currently pay?
How are they currently paying?
How would they prefer to pay?
How much does each Revenue Stream contribute to overall revenues?

TYPES
Asset sale
Usage fee
Subscription Fees
Lending/Renting/Leasing
Licensing
Brokerage fees
Advertising

FIXED PRICING
List Price
Product feature dependent
Customer segment dependent
Volume dependent

DYNAMIC PRICING
Negotiation (bargaining)
Yield Management
Real-time-Market

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Appendix 2: Interview protocol Lean Startup Methodology

Company's introduction (10 min)

- Can you describe your business model?
- To which extent is your company active in a commoditized market?
- What are the goals of your company?
- How can the LSM contribute on those goals?

Lean startup management (10 min)

Entrepreneurship:
- When an employee has a great idea how can they develop that idea into realization?
- How do you keep your employees accountable?

Innovation process:
- Can you describe the innovation process of your company?
- To which extent did the LSM contributed on the creation of better products?
- To which extent does the LSM prevents wasting resources?

Management:
- How do you measure innovation output?
- How did the LSM improved the coordination between departments and employees?
- In which way did your company had to change the processes or structures to produce the new product/service?

Management Skills (10 min)

Management skills
- What are the primarly responsibilities of managers when implementing the LSM?
- What type of manager (e.g. visionairy) does the implementation of this model require?
- What doesn't work?

Shit umbrella
- To which extent do managers have to be external people, in order to avoid political and hierarchical proportions?
- How can managers be shit umbrellas for their employees?

Collaboration
- How are interactions with other departments organized to learn and turn?

Validated learning (15 min)

MVP's
- What are the outcomes in terms of MVP's before and after the LSM?
- How do you engage employees to get out of the building?

Learning cycles
- How important is validation in the innovation process?
- When an employee makes a validation mistake, how does the organization refers to it? As an important lesson learned or otherwise?

Customer value creation
- To which extent did your company provide innovative solutions to the market?
- In which way were these solutions creating new business opportunities?

Culture (15 min)

Experimentation
- Can you describe the organizational culture (in terms of risk taking, freedom, creativity and agility)?
- From your perspective, to which extent has the culture changed over time due LSM ?
- To which extent was your company's culture ready to fully adapt LSM?

Responsibility
- In which way do employees have mandates?
- To which extent do employees take responsibilities?

Development
- To what extent did LSM change the skills of your employees?

Appendix 3: Score cards case studies

Research subject	Items	Questions	ING	Eneco 1	Eneco 2	Rabobank 1	Rabobank 2	ABN AMRO
Lean startup management	**Entrepreneurship**	Idea development	+++	+++	+++	+++	+++	+++
		Accountability	+++	+++	+++	+++	+++	+++
	Innovation	Innovation process	+++	+++	+++	+++	+++	+++
		Better products	+++	+++	+++	+++	+++	+++
		Wasting resources	+++	+++	+++	++	+++	+++
	Management	Innovation process measurement	+++	+++	+++	+++	+++	+++
		Coordination between departments	+++	++	++	+++	+++	+++
		Process and structure changes	+++	++	++	++	++	+++
Management Skills	**Management skills**	Primarly responsibilities of managers	+++	+++	+++	++	++	+++
		Type of manager	+++	+++	+++	++	++	+++
		Lesson learned	+++	+++	+++	+++	+++	+++
	Shit umbrella	No external people needed	+++	+++	+++	++	++	+
		Shit umbrella role	+++	+++	+++	++	++	+++
	Collaboration	Learning cycles between departments	+++	+++	+++	+++	+++	+++
Validated learning	**MVP's**	Outcomes after LSM	+++	+++	+++	+++	+++	+++
		Employee engagement	+++	+++	+++	+++	+++	+++
	Learning cycles	Importance of validation	+++	+++	+++	+++	+++	+++
		Failure is a lesson	+++	++	+++	++	++	+++
	Innovation	Innovative solutions	++	++	+++	++	++	++
		Creating new business opportunities	++	++	+++	++	++	++
Culture	**Experimentation**	Favourable innovation culture	+++	++	+++	++	++	+++
		Culture change due LSM	+++	++	++	++	++	++
		Initial culture ready for LSM	+++	++	++	++	++	++
	Responsibility	Employee mandates	+++	++	++	++	++	+++
		Employee responsibilities	+++	+++	+++	+++	+++	+++
	Development	Employee skills development	+++	++	++	+++	+++	+++

Research subject	Item	Questions	Quotes/Answers	Weak	Medium	Strong
Lean startup management	Entrepreneurship	When an employee has a great idea how can they develop that idea into realization?	"We use an innovation guide to perform an international innovation transmission, via LSM."	no guidelines	some guidelines	innovation proces
		How do you keep your employees accountable?	"If the team isn't meeting the milestones and dont deliver, we pull the plug, or then they go back to their own job or the team will be dissolved". Squads have to determine how they are going to meet the objectives and key results. They are examining these KPI's each quarter."	no accountability	some accountability	pulling the plug
	Innovation	Can you describe the innovation process of your company?	"There is an innovation fund and there is one person who is in charge of this fund." He acts like a VC and he challenges people what their learnings are, why and how they executed certain activities and why they need more money. They work with stage gates. Teams in these accelerator programs set their own targets and have full autonomy. They have to challenge problems ING is facing, the way how they solve these problems are up to them.	less tangible	tangible	detailed
		To which extent did the LSM contributed on the creation of better products?	ING tries to enable the fragility and focus their organization on areas to add value to customers. To maximize value sooner and better. Lean startup is helping creating MVP's and validating from making big mistakes. "To make products our customers want to use, nothing more but better products. Preferably with higher usage rates."	small extent	medium extent	large extent
		To which extent does the LSM prevents wasting resources?	"It's crucial to use the resources to the maximum and not produce any waste. That is one of the main goals of LSM. LSM is helping us to lower and waste and maximize the usage of resources. We are still growing on this point and the innovation fund has waste prioritized within the key metrics."	small extent	medium extent	large extent
	Management	How do you measure innovation output?	"We enable teams to maximize their output in terms of product usages, revenues from new products or services introduced, revenues from products or services sold to new customer segments on a certain project."	no metrics	vanity metrics	key metrics
		How did the LSM improved the coordination between departments and employees?	"Also coordination between tribes is important. So, problem solving, networking. The structure is simple, but that doesn't mean that the complexity also became simple. There are still legacy systems and programs that different tribes are working on simultaneously. Agile working is constantly prioritize, setting the directions for the company."	no improvement	improved	strong improvement
		In which way did your company had to change the processes or structures to produce the new product/service?	"The production process and more the organization structure. The structure had to change to adapt LSM. The structure makes is possible to drill holes in the silos, to be smaller and to have an open structure. It is an enabler to better produce products."	no adaptions	some adaptions	new adaptions
Management Skills	Management skills	What are the primarily responsibilities of managers when implementing the LSM?	"The main task of tribe leaders is to ask people how they can them to more effective. The squads have to meet the objectives and key results of the tribe. It is easy for a team to focus on their own focus, it is more important to focus people on the bigger picture, the tribe. And that is hard."	intangible	some tangible	tangible
		What type of manager (e.g. visionairy) does the implementation of this model require?	Supportive leadership is important, the urgency to help people every day. "A part of the role is people leadership. There are no traditional leaders anymore."	traditional manager	less traditional manager	supportive manager
		What doesn't work?	Less ego, because the tribe is the important aspect of their daily job. There is no room for people with big ego's.	supportive manager	less traditional manager	traditional manager
	Shit umbrella	To which extent do managers have to be external people, in order to avoid political and hierarchical proportions?	"The main task of tribe leaders is to ask people how they can them to more effective to reach their goals. "This means that everyone within the tribe has a clear vision of the desired goals." "So, external people are not necessary in this case, because everyone has the same goals."	Lots of political and hierarchical proportions	Some political and hierarchical proportions	No political and hierarchical proportions
		How can managers be shit umbrellas for their employees?	"Very important aspect, a leader protects the teams by setting clear priorities and hold steady on that course." "No intervening is possible then. Managers can say to others: please come back over a year. Delightful!" They removed a lot of coordination layers and coordination roles. So, teams have more mandate to decide much more, because there are no steering committees. So, there is also less shit to be protected from.	no shit umbrella	some intervening	no intervening possible
	Collaboration	How are interactions with other departments organized to learn and turn?	"We have monthly standups within the different squads". Also team managers participate in different meetings, so sharing and teaching has a priority."	not organised	periodly	scrum wise
Validated learning	MVP's	What are the outcomes in terms of MVPs before and after the LSM?	"The problem is not the amount of ideas, the problem is the follow up. Ideas are great, but meaningless if they don't exist in the real world." "There are less MVP's after LSM because we validate better." The real trick is to convert it to something real. There are spaces needed where people can make their ideas to live. And that is happening in the tribes."	more	the same	less
		How do you engage employees to get out of the building?	"In general we push people to experiment and get out of the building." "It is hard for people who never done it." "Yes, its ok to talk to clients and ask them stupid questions, because many people think that it is unprofessional." "But knowing is asking and encouraging people to fail." "That is not easy in a corporate organization. "But learning is doing and people see that is it fun!"	no actions	ask	push
	Learning cycles	How important is validation in the innovation process?	ING can built anything, but the question if they should. "Validation is therefore key for us." "We are responding on the customer demands by validating our assumptions." This results in less waste of time and money and major mistakes. It's crucial to use the resources to the maximum and not produce any waste.	not important	some what important	very important
		When an employee makes a validation mistake, how does the organization refers to it? As an important lesson learned or otherwise?	ING makes small mistakes. LSM is helping creating MVP's and validating from making big mistakes. "Still ING should get better at learning from mistakes" "This process took some time, but now we learn more and more to increase our learning capacity."	Fired!	rather make no mistakes	mistakes are essential
	Innovation	How did your company provide innovative solutions to the market?	LSM is mainly used for incremental innovations, there are less disruptive things going on. But is still complex to turn your business model around and find new stuff."	no solutions	some solutions	innovative solutions
		To which extent were these solutions creating new business opportunities?	Incremental stuff." "Engaging a customer in the process is important to really understand what they want. "When a customer doesn't use the Mobile app, it is good that you call this customer and ask: "Why don't you use our Mobile app".	no opportunities	some opportunities	new opportunities
Culture	Experimentation	Can you describe the organizational culture (in terms of risk taking, freedom, creativity and agility)?	"Our culture supports seeking new adventures, take risks and learn from mistakes within the tribes. The change in behaviour is most important." "ING want people to experiment and learn different stuff. The board is not intervening and let the people innovate."	exploitation	some what explorative	explorative
		From your perspective, to which extent has the culture changed over time due LSM?	Within the tribes changing the cultural aspect was by far the most important one to get innovative." "We encourage people to share their failures by giving awards for the biggest failures." "Within a key proposition, if failure will happen how can they minimize the blast radius." "That is important." In order to learn they celebrate small mistakes".	no change	some changes	big changes
		To which extent was your company's culture ready to fully adapt LSM?	"There is a certain culture needed to start with Lean Startup and then proofing that it works and in the end it will help changing the culture." "LSM has its limitations for existing businesses, that's why ING started this culture program within the innovation departments."	not ready	hybrid	fully adaptable
	Responsibility	In which way do employees have mandates?	ING gave their team as much as autonomy as they could give, better alignment as they need. "There are a lot of politics, but without managers there is less talking. Not prescribing, but enabling people to take responsibility and create autonomy."	no mandates	limited mandates	full mandates
		To which extent do employees take responsibilities?	"Autonomy improves the willingness to take action and responsibility".	no responsibilites	some responsibilites	more responsibilities
	Development	To what extent did LSM change the skills of your employees?	LSM helped according to the Five Why's." "When people fail, then they develop their skills." "The questions we ask are: 'Why did you fail?' And 'How can you stop the failures and learn? 'People need the right mindset, that is important and this is also a cultural thing.' "You can say that is OK to fail, but people have to feel it." "If someone fails that person needs to get praised for it instead of be burned off." "That will gain trust and also autonomy, but not everybody is ready to have that creativity."	weak influence	medium influence	strong influence

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Research subject	Item	Questions	Eneco Quotes/Answers	Weak	Medium	Strong
Lean startup management	Entrepreneurship	When an employee has a great idea how can they develop that idea into realization?	"LSM and the lean canvas helps to be more keen and confront others to make sharpen the idea / plan and it helps determine the starting point." "The innovation toolbox has been initiated since September 2015. "The problem solution fit instigates the classic lean startup phases and at any stage the business case / model gets more tangible."	no guidelines	some guidelines	innovation process
		How do you keep your employees accountable?	"At each stage, the plan can be killed. By killing projects people feel that they have failed." "That personal failure is negative." "Eneco tries to support them to execute projects with higher results." "People tend to go on too long on a project, people don't get fired." "The important thing is that they have learned and capture those learnings in Sharepoint."	no accountability	some accountability	pulling the plug
	Innovation	Can you describe the innovation process of your company?	"The gate review board determine together with the vertical leader if the business case can be continued within each gate." "The discussions are shared with the business developer." "Each gate entails certain criteria, to overcome each gate team's have to deliver." "The total process time is approximately 7 to 9 weeks for successful plan, or sooner when plans falls after a certain gate."	less tangible	tangible	detailed
		In which ways did the LSM contributed on the creation of better products?	"The business model of Eneco needs to change." "It will not be selling more energy, it will just be less." So, Eneco developed products which can better deliver new business, such as Toon."	small extent	medium extent	large extent
		To which extent does the LSM prevents wasting resources?	"It is mainly theoretical, Eneco has made it practical. "So, now funding can only start when the lean canvas has been used and the resource planning has been delivered, that's how we first begun to stop wasting resources."	small extent	medium extent	large extent
	Management	How do you measure innovation output?	"We measure output based the past learnings, pay off time, customer feedback and return on invested capital."	no metrics	vanity metrics	key metrics
		How did the LSM improved the coordination between departments and employees?	"In the past, the decision laid into person's hand. Now several persons take action and coordinate tasks and decisions in very structured process." "Within LSM the process is transparent and it has established certain criteria for each phase and it determines the potential in terms of sales, margins and targeting."	no improvement	improved	strong improvement
		In which way did your company had to change the processes or structures to produce the new product/service?	"When employees want to innovate, they can decide how to present something. However, one has to meet each criteria at a certain gate. "It is the intention of Eneco that this process becomes more and more familiar with in the employees."	no adaptions	some adaptions	new adaptions
Management Skills	Management skills	What are the primary responsibilities of managers when implementing the LSM?	"Managers have to coach employees, who not actively participate in the learning process." LSM is somewhat new and managers have to create a buzz to activate to apply LSM.	intangible	some tangible	tangible
		What type of manager (e.g. visionary) does the implementation of this model require?	"Someone who steers and formulate common goals." "Someone who emphasize the needed preparations from the team and sharpen their action plan and coordinate the needed resources."	traditional manager	less traditional manager	supportive manager
		What doesn't work?	"Prescribing employees what to do is not the way to go." "Ask employees how they overcome a certain problem is an effective way."	supportive manager	less traditional manager	traditional manager
	Shit umbrella	To which extent do managers have to be external people, in order to avoid political and hierarchical proportions?	"Bureaucracy doesn't have a strong presence at the company." So, all people have the same goals and norms."	Lots of political and hierarchical proportions	Some political and hierarchical proportions	No political and hierarchical proportions
		How can managers be shit umbrellas for their employees?	"The vertical leader is more of a shit umbrella." "The department innovation and ventures is all about innovation. Employees in this department embrace innovation. Sustainability is an important aspect of their strategic ambitions and like to go out and talk to customers." "The vertical leader makes sure that the employees focus on their job."	no shit umbrella	some intervening	no intervening possible
	Collaboration	How are interactions with other departments organized to learn and turn?	"Monthly standup where employees can tell what they do, what they have learned and what they need." "Also the gates serve employees to proclaim what they have learned, by documenting and sharing."	not organised	periodly	scrum wise
Validated learning	MVP's	What are the outcomes in terms of MVP's before and after the LSM?	"Too many MVPs can form a overdosis." Due LSM we are killing more idea's than before." That is hard, but fair and just given our innovation process."	more	the same	less
		How do you engage employees to get out of the building?	"Eneco is engaging employees to accompany the innovation process and is trying to deliver on the innovation goals by facilitating employees to get out of the building and to maximize their learnings." "So, the employees who work here applied for the positions based on their willingness, the required competences and experiences."	no actions	ask	push
	Learning cycles	How important is validation in the innovation process?	"Validation is of course handy when you test your assumptions, but it is hard." "Asking the right questions to determine the next steps can be better." "Validating makes us able to build, measure and learn at high speed."	not important	somewhat important	very important
		When an employee makes a validation mistake, how does the organization refers to it? As an important lesson learned or otherwise?	"We want to ensure continuity by adopting various business models and to remain a major player in the market." "We have to learn. "With new products and services we can better meet the needs of consumers." So, employees will make mistakes during this searches." "When someone makes a mistake, we always have safeguards and see it as a learning." "No big mistakes were made at Innovation and Ventures".	Fired!	rather make no mistakes	mistakes are essential
	Customer value creation	How did your company provide innovative solutions to the market?	"Toon now falls under both Eneco Consumer and Innovation and Ventures. "Toon helps giving consumers insight in their energy usage and creates more awareness regarding sustainability." "Eneco has 8 verticles, one of them is Smart Home to come up with new propositions for Toon."	no solutions	some solutions	innovative solutions
		To which extent were these solutions creating new business opportunities?	"It also has an open API which other parties such as startups or developers or major partners can use to make innovations. "Open API is a chance and it has been initiated throughout Eneco."	no opportunities	some opportunities	new opportunities
Culture	Experimentation	Can you describe the organizational culture (in terms of risk taking, freedom, creativity and agility)?	"From out of our RVB there is great attention to innovation. Freedom to develop is maybe a first step for us and we are moving away from our traditional culture as an energy company."	exploitation	somewhat explorative	explorative
		From your perspective, to which extent has the culture changed over time due LSM?	"We started since October so we are constantly learning new configurations to boost an innovative culture." "You can see that we now are more interested to get new information in the market, test assumptions and propose new products that normally never had been developed. Slowly the culture changes because employees see great things happening with LSM."	no change	some changes	big changes
		To which extent was your company's culture ready to fully adopt LSM?	"Eneco wasn't quite ready for LSM, but when we designed the innovation process, our RVB saw that they don't lose their authority. "All	not ready	hybrid	fully adaptable
	Responsibility	In which way do employees have mandates?	"All employees have freedom to develop products and services between the gates, but they do not have any mandates." "Autonomy is limited but still great things happen between the gates."	no mandates	limited mandates	full mandates
		To which extent do employees take responsibilities?	"This leads that employees are willing to take responsibility and action because there are better equipped."	no responsibilities	some responsibilities	more responsibilities
	Development	To what extent did LSM change the skills of your employees?	"Eneco started a development program. Each month employees are taught basic skills, to retrieve more routine skills." "For example, how do our team's can work better together and how to make a business case."	weak influence	medium influence	strong influence

Eneco 2

Research subject	Item	Questions	Quotes/Answers	Weak	Medium	Strong
Lean startup management	Entrepreneurship	When an employee has a great idea how can they develop that idea into realization?	"We have established a innovation process, since October 2015: discover, driven growth; portfolio management." "We determine in advance our ruler of success." "Then one needs to determine which projects are connected with our goals and which criteria are important."	no guidelines	some guidelines	innovation proces
		How do you keep your employees accountable?	"Employees are become more accountable for their actions, because using LSM we can now measure their progressions and learning, so we can run or stop much easier."	no accountablity	some accountability	pulling the plug
	Innovation	Can you describe the innovation process of your company?	"This is done at project level and at the portfolio level." At project level, one gets funding until the next gate on the basis of LSM, one validates from right to left in the business model canvas. Including the product/market fit validation." "Thus, one ensures that we validate quick and fail cheap to prevents budget drain."	less tangible	tangible	detailed
		In which ways did the LSM contributed on the creation of better products?	"The transformation that Eneco is undergoing in one of from a commodity business, with little added value, to new business: service innovation." Thus, Eneco is leaving their traditional business model. These are services are related to data. "Eneco has a lot of data and it exploit new services." "LSM is helping to create new and better propositions to make us able to create new services."	small extent	medium extent	large extent
		To which extent does the LSM prevents wasting resources?	"LSM delivers in this transformation the structure that we first have to validate our main hypotheses. It makes good sense that where we at first run the risk to invest people and money, and launch products and services into the market and then we find out that we were completely wrong."	small extent	medium extent	large extent
	Management	How do you measure innovation output?	"Innovation output is measured on the basis of return on sales." "Projects must comply with increasing efficiency." "Speed is needed to make the products work quickly and then bring them to the market and make them successful." "Eneco does not have to be the best products, but fastest ones." "Also, the number of solutions and the degree of impact on clients is even important."	no metrics	vanity metrics	key metrics
		How did the LSM improved the coordination between departments and employees?	"Monthly looks at one of the success achieved on the basis of speed, learnings, bottlenecks, resources, etc." "One can draw conclusions on portfolio level. It's hard to kill things and it feels painful. If you look at the project level matters may feel it as a personal failure. "However, looking from the portfolio level, for example, one can come to the conclusion that has a different project more potency." "Shifts to the next project will be felt more like a team effort towards the success, the personal failure."	no improvement	improved	strong improvement
		In which way did your company had to change the processes or structures to produce the new product/service?	"Our processes changed, so they are much leaner due LSM and our team structure is different, because if you want speed you need smaller teams that can deliver results." That is way different than before. "It's more that we created an different company within the existing one."	no adaptions	some adaptions	new adaptions
Management Skills	Management skills	What are the primarly responsibilities of managers when implementing the LSM?	"When using LSM you have to break up problems into manageable chunks and managers have to determine which chunks are important to validate." Eventually, this is a managerial decision." "That is the greatest learning point." The larger the problem is, the higher the risk great and the decision-making becomes very difficult and that can lead to inertia."	intangible	some tangible	tangible
		What type of manager (e.g. visionary) does the implementation of this model require?	"Managers who can think out of the box and can function as a coach." We hire people with no experience in the energy industry to properly incorporate a degree of dissident. "Also, a networking managers we can establish collaborations with external parties, consultants and students in co-creations."	traditional manager	less traditional manager	supportive manager
		What doesn't work?	"Managers who tell employees what to and when to do, that's also a dinosaur like situation. For mature business that is the management type that is recommended, not for innovation goals."	supportive manager	less traditional manager	traditional manager
	Shit umbrella	To which extent do managers have to be external people, in order to avoid political and hierarchical proportions?	We don't have external people, and this is not an issue, this is also a budget matter. "Off course there are political relations." "The people who have the say do not always sit on the chairs, but Eneco has set clear goals and everyone is well aware of those goals." "I don't feel that these factors are influencing our work."	Lots of political and hierarchical proportions	Some political and hierarchical proportions	No political and hierarchical proportions
		How can managers be shit umbrellas for their employees?	"Our business director fulfills that role perfectly." "The team consists of 8 people and is probably too small for such a role." "Also this is a task for someone an senior management level." "Strategic choices have to be made on that level in order to keep steady." "That's why our business director have this role as for an whole department; so we can steer a department as solid as possible."	no shit umbrella	some intervening	no intervening possible
	Collaboration	How are interactions with other departments organized to learn and turn?	"There is a format and dialogue with regard to the progress." "Each week we discuss the progress of a project with the board, product developers, business developers and vertical leaders which items/resources are needed in order to go to the next step. "In those meetings observations and dialogues are important aspects to learn from one and other and constantly focus on our direction."	not organised	periodly	scrum wise
Validated learning	MVP's	What are the outcomes in terms of MVP's before and after the LSM?	"LSM creates a filter to blast or kill projects, and many are killed." This fact hurts. When a project goes to the next gate everyone is proud. "So, there a less MVP after using LSM."	more	the same	less
		How do you engage employees to get out of the building?	"People at Servicelab have a certain entrepreneurial mind and agility to use LSM and it gives an extra swing to learn things when they get out of the building and develop themselves in a different way."	no actions	ask	push
	Learning cycles	How important is validation in the innovation process?	"To overcome errors, employees see validation is an important part of the learning experience." "Validation is helping to spot errors and learn how to prevent these errors and formulate new solutions."	not important	some what important	very important
		When an employee makes a validation mistake, how does the organization refers to it? As an important lesson learned or otherwise?	"When someone make a mistake, is seen as an important development." "When issues are identified that are not labeled as wrong for the market introduction, but as learnings. "It is different if an error is made for the third time or for the first time." The learnings within ServiceLab are inexpensive.	Fired!	rather make no mistakes	mistakes are essential
	Customer value creation	How did your company provide innovative solutions to the market?	"For now, we have produced co creations with our companies to make an impact for customers and heading towards our goals." "We can derive new services from our data and that will make great impact on Eneco side and in the future towards our customers."	no solutions	some solutions	innovative solutions
		To which extent were these solutions creating new business opportunities?	So, we combined resources with startups to achieve more impact and build a sustainable business."	no opportunities	some opportunities	new opportunities
Culture	Experimentation	Can you describe the organizational culture (in terms of risk taking, freedom, creativity and agility)?	"Culture varies by business unit". "There is a large degree of freedom and responsibility within ServiceLab." There is a great behavior where themes as innovation and sustainability are supported."	exploitation	some what explorative	explorative
		From your perspective, to which extent has the culture changed over time due LSM?	"LSM helped us to be better in innovate things and use validation as important part in learning and build better structures to align better with our stakeholders."	no change	some changes	big changes
		To which extent was your company's culture ready to fully adapt LSM?	There is a good base within ServiceLab regarding agility and entrepreneurial scope, so the organization didn't had a shock moment."	not ready	hybrid	fully adaptable
	Responsibility	In which way do employees have mandates?	"Mandates are linked with risks, because within mature business the uncertainty is lower than in comparison with new business and it has shorter payback periods." "LSM is only used within business cases where the uncertainty is high, then the mandates are little."	no mandates	limited mandates	full mandates
		To which extent do employees take responsibilities?	"Nevertheless, our people at ServiceLab take responsibilities to find new business cases and validate in order to learn."	no responsibilites	some responsibilites	more responsibilities
	Development	To what extent did LSM change the skills of your employees?	"It is helpful if an employee knows LSM, however, to learn that. One should have the motivation to learn and be able to put their knowledge into practice. "LSM helped to create a better innovation structure and therefore employees are better in innovating."	weak influence	medium influence	strong influence

Research subject	Item	Questions	Quotes/Answers	Weak	Medium	Strong
Lean startup management	Entrepreneurship	When an employee has a great idea how can they develop that idea into realisation?	"We started with the Rabobank's Moonshot campaign". That is very impressive, because employees has been given the chance to execute their idea into realization. We make use of a 'do-it-yourself' toolkit, where the LSM principles are used.	no guidelines	some guidelines	innovation process
		How do you keep your employees accountable?	Employees who are working on their idea receive funding to provide an MVP, when their pitch before the innovation board has succeeded. In case the criteria are not met in a next stage, they will return to their old jobs or plans will be cut off with funding and they have to work on other projects. "Employees are accountable for what they do, so projects can be stopped if they don't evolve." Important is that they and seek new adventures and that we are willing to invest in them."	no accountability	some accountability	pulling the plug
	Innovation	Can you describe the innovation process of your company?	"The innovation process entails the steps of a transparent process and metrics to determine a success of an idea. First of all, employees need to use our Innovation Toolkit in order to answer questions and structure their idea." "After that, they will be linked to an Innovation coach. This is someone who is experienced with creating new products and has knowledge about LSM." Each gate means achieving milestones.	less tangible	tangible	detailed
		In which ways did the LSM contributed on the creation of better products?	"This created new opportunities for example for our Rabobank Wallet app." "Each time we were learning new insights and we got to learn our customer." After that we could predict new features our focus groups will use.	small extent	medium extent	large extent
		To which extent does the LSM prevents wasting resources?	Waste is hard to determine if you don't know what can be labelled as waste, because some efforts in time and money are needed to come to a certain point to learn enough to pivot." "LSM helped us with identifying waste." "LSM is preventing us to waste resources, but it can be much greater than we already do."	small extent	medium extent	large extent
	Management	How do you measure innovation output?	"We look at the number of ideas proposed and the success rate of the ideas turned into MVP's, invested funds, the return rates." Some indicators are more important when a MVP has been launched. Then you look at cost of acquisition, activation rates and paying customers.	no metrics	vanity metrics	key metrics
		How did the LSM improved the coordination between departments and employees?	"LSM taught us that ambiguity is important to achieve success." Employees can help each other to do cool things. By sharing learnings and ask for help regarding issues employees can develop great things in weekly standups." Important is that when these standups are scheduled everyone is present." "That makes it possible that everyone is sharing and learning." Also, when employees get excluded gaps will arise and maybe some will be blamed, but they cannot explain them selves because they are not present!	no improvement	improved	strong improvement
		In which way did your company had to change the processes or structures to produce the new product/service?	"We changed our processes for implementing LSM, because working towards an MVP wasn't always our goal." Very often we wanted to launch a product after lots of research, approvals and funding. "Now we develop within weeks a MVP and then we seek clients we are willing to use our product."	no adaptions	some adaptions	new adaptions
Management Skills	Management skills	What are the primary responsibilities of managers when implementing the LSM?	"Managers have to coach the team to search and find the pains and gains. Managers need to spend more time on evaluating the processes team's make in term s of the pains and gains and oversee the gaps in validation." So, coaching team s that they fully use LSM techniques.	intangible	some tangible	tangible
		What type of manager (e.g. visionary) does the implementation of this model require?	"Managers who are encouraging change and who are not scared to over throw the status quo." "Managers tend to solve problems with the same thinking they did, they now need to think through out other perspectives, thats hard within Rabobank." "Managers need to be more storytellers and draw possible storylines."	traditional manager	less traditional manager	supportive manager
		What doesn't work?	"Stuck in narrow mindedness." Managers must create an certain ideology where employees can relate to.	supportive manager	less traditional manager	traditional manager
	Shit umbrella	To which extent do managers have to be external people, in order to avoid political and hierarchical proportions?	"Their attitude needs to be from someone who is external. I don't believe that managers have to be external because the task for our managers is to develop new products and services to create new business models." "So, no one can argue about setting new goals caused by political agendas."	Lots of political and hierarchical proportions	Some political and hierarchical proportions	No political and hierarchical proportions
		How can managers be shit umbrellas for their employees?	"We develop each years a roadmap according to our goals." "Managers try to be shit umbrellas for their employees, but our bank is in a transition mode, so priorities tend to shift on our roadmap." Hopefully, after the transition our managers can execute their role much better.	no shit umbrella	some intervening	no intervening possible
	Collaboration	How are interactions with other departments organised to learn and turn?	"In de weekly standups employees can share their learnings. Also, we hired LSM coaches who are training different teams." So, we have anchored learnings within teams and coaches. Most of the time employees are pivoting and that is valuable for teams that they can change course to be agile."	not organised	periodly	scrum wise
Validated learning	MVP's	What are the outcomes in terms of MVP's before and after the LSM?	"Employees have much ideas, but very few make it to get funded and become an MVP." LSM truly helped us to concentrate on the best ideas and build up the success."	more	the same	less
		How do you engage employees to get out of the building?	"Our employees are selected due assessments and the needed skills to innovate." Also our employees are intrinsic motivated to seek new opportunities and have the competences to make a difference at their job. "Also, when employees don't deliver on their results, their funding will be stopped."	no actions	ask	push
	Learning cycles	How important is validation in the innovation process?	"Very important." "Validation is the most valuable aspect of innovation." "Our LSM coaches are continuously focusing on validation aspects and their measurements." "Validation means, go to the next step. If you don't validate, you don't prove or disapprove your assumptions.	not important	some what important	very important
		When an employee makes a validation mistake, how does the organisation refers to it? As an important lesson learned or otherwise?	"Mistakes can happen and we don't want to make big mistakes, mistakes are granted with a certain impact." "We are not some Silicon Valley startup who celebrate failure after failure."	fired	rather make no mistakes	mistakes are essential
	Customer value creation	How did your company provide innovative solutions to the market?	"We have used LSM to validate our assumptions with new payment methods on events." "With sprint sessions we were able to implement learnings quickly into our ticketing app. This was pretty successful, because we learned different things even though we were not seeking for this insights." "That is why we created new features during these validations."	no solutions	some solutions	innovative solutions
		To which extent were these solutions creating new business opportunities?	"This created new opportunities for example for our Rabobank Wallet app." "Each time we were learning new insights and we got to learn our customer." "After that we could predict very closely new features our focus groups will use."	no opportunities	some opportunities	new opportunities
Culture	Experimentation	Can you describe the organisational culture (in terms of risk taking, freedom, creativity and agility)?	"Rabobank has started a culture program where we have determined many new values and norms. Innovative entrepreneurship is one of them and contains that employees need to seek new opportunities for themselves and the bank and its customers to make change possible." "Rabobank still has got to go a long way, because the entrepreneurial aspect is not top of mind." "When we hire new employees we also check if they have got what it takes."	exploitation	some what explorative	explorative
		From your perspective, to which extent has the culture changed over time due LSM?	"It starts with how employees think. If you can change the way employees think, hopefully they will change their actions." "LSM has changed the way employees think about innovation and they see that the new way of thinking is gaining results."	no change	some changes	big changes
		To which extent was your company's culture ready to fully adapt LSM?	"Not ready at first." "Like I said, employees need to change and results matter." "Now we have the results hopefully we can elaborate further on that."	not ready	hybrid	fully adaptable
	Responsibility	In which way do employees have mandates?	"Employees have little mandates, they can decide the course and the needed resources." "The innovation Board is in charge regarding funding and the saying about resources."	no mandates	limited mandates	full mandates
		To which extent do employees take responsibilities?	"Employees take responsibilities because they are intrinsically motivated to make a success." "So, employees are taking that extra step."	no responsibilities	some responsibilities	more responsibilities
	Development	To what extent did LSM change the skills of your employees?	"Great deal here." "Employees have learned much about themselves and the team members." "Now you can say that employees now trust each other more than before." "The communication is much better now and that results in speaking the same language and coaching each other to get better and learn in a trustworthy environment."	weak influence	medium influence	strong influence

Research subject	Item	Questions	Quotes/Answers	Weak	Medium	Strong
Lean startup management	Entrepreneurship	When an employee has a great idea how can they develop that idea into realisation?	"At Rabobank we offer people to develop their idea using our toolkit." "Or make an appointment with an innovation manager to get advice." "Important is that people need to find the right persons to get advice and support."	no guidelines	some guidelines	innovation process
		How do you keep your employees accountable?	"Accountability is used to stop projects, we rather look at benefits when projects succeed. When projects fail, people will experience an negative feeling and our feedback is that people have helped Rabobank stop wasting resources." "There are many downsizes to that scenario. We haven't laid off any people, so we still encourage people to innovate." "Off course funds will be stopped, as simple as that". "It's nothing personal."	no accountability	some accountability	pulling the plug
	Innovation	Can you describe the innovation process of your company?	"People can send in their plans or talk with their manager or an innovation manager." "The screening of an idea is crucial that's why we want to support people to contact an innovation manager or a product owner." "From here people will enrol in a stage process where in every gate requirements are asked. Each requirement can be achieved by using and gaining resources." "Our innovation board controls and will make the decision if requirements are delivered and the plan can go to the next stage." "Funding is controlled by our innovation board, their input is needed to go to the next stage."	less tangible	tangible	detailed
		In which ways did the LSM contributed on the creation of better products?	"Our goal is to deliver our clients a 9+ experience. That can only be achieved if we give a huge value for money. Therefore we are constantly improving our products. So, I can say that our products got better, because we are using our clients's input to deliver better products."	small extent	medium extent	large extent
		To which extent does the LSM prevents wasting resources?	"LSM is helping us to eliminate waste in our innovation process." "This has a great impact in the way we organize things." "By developing a MVP very fast we can fail cheap and fast." "We know in an early stage if a proposition is going to earn money for the bank or will be cash drain." "We still have to grow in the adaption of LSM and we see the benefits already."	small extent	medium extent	large extent
	Management	How do you measure innovation output?	"On different ways, almost 95% of the ideas are killed, 5% are MVP's and those ideas have the potential to be an true product, the success rate." "After a launched product we look at the usage rate of our customers." "We still look at key economic ratios such as Net present value, Internal rate of return and profit-to-investment ratio."	no metrics	vanity metrics	key metrics
		How did the LSM improved the coordination between departments and employees?	"When you put people in a room they hopefully want to collaborate with each other." "We saw that every person has different goals." "When we started with LSM pretty soon people felt being part of a team." "Eventually LSM will lead to have more collaboration and build, measure and learn from each other." "The important thing is not to exceed more than 9 people in a team." "If your team is too big, it can be more difficult to coordinate work." "This resulted in a seamless integration and coordination between our DevOps teams and product management."	no improvement	improved	strong improvement
		In which way did your company had to change the processes or structures to produce the new product/service?	"In certain way both areas were needed to change." "We were able to build on an agile way, but the linkage with other disciplines needed another structure." "Teams are now more connected by working in the same office and we changed the development processes." "We learned that teams can flourish if they are connected physically."	no adaptions	some adaptions	new adaptions
Management Skills	Management skills	What are the primary responsibilities of managers when implementing the LSM?	"Managers have to understand LSM, that sounds funny, but lots of managers think they know LSM, but managers have to dream the essential steps." "Also, managers have to determine with their team, certain values and beliefs." "LSM works within transparent guidelines, trust and team ethics."	intangible	some tangible	tangible
		What type of manager (e.g. visionary) does the implementation of this model require?	"Less thinking, more structuring the working method." "LSM encourages people to explore, managers have to be aventure seekers also. That comes more and more around within Rabobank, just not now." "A person who can enable a learning environment." "An ambidextrous person." "Or a more T-shaped person." "Someone who can talk the strategically VC's slang and also knows about the bits and bytes, that's work in progress."	traditional manager	less traditional manager	supportive manager
		What doesn't work?	"Someone who is telling people what to do." "It's more enabling people to seek the 'how' and 'what' within a solution." "Create an structure for people to be more innovative."	supportive manager	less traditional manager	traditional manager
	Shit umbrella	To which extent do managers have to be external people, in order to avoid political and hierarchical proportions?	"Not needed." "I don't believe that someone needs to be an external person." "I think it is bullshit." "Everyone gets paid to do their jobs properly and needs to be professional and think what is best for the company."	Lots of political and hierarchical proportions	Some political and hierarchical proportions	No political and hierarchical proportions
		How can managers be shit umbrellas for their employees?	"Managers have tight schedules and the hierarchy pressure can be severe." "We now see that certain goals tend to change during a period of time." "So, when a total department is turning, you cannot go straightforward as a team." "It's difficult for a bank to create shit umbrellas."	no shit umbrella	some intervening	no intervening possible
	Collaboration	How are interactions with other departments organised to learn and turn?	"That's a cool thing." "We have weekly standups were people must make a presentation about the things they have learned and lacked." "So, managers and people from different teams hear and share their experiences and knowledge."	not organised	periodly	scrum wise
Validated learning	MVP's	What are the outcomes in terms of MVP's before and after the LSM?	"Less MVP's, like a year ago we retrieved lots of plans for incremental innovations." "Certain ideas received funding, and failed completely." "Now we are opening up those ideas and try to execute them with LSM." "Cold case approach and people implement those learnings in other projects."	more	the same	less
		How do you engage employees to get out of the building?	"When they don't go out, they will learn nothing. If they learn nothing their idea will fall and with failure comes cutting off funding." "So, there is less engagement for me to do."	no actions	ask	push
	Learning cycles	How important is validation in the innovation process?	"Validation is an art, which can be taught via LSM." "What do you want to validate and what kind measurements are there?" "Before validation is producing assumptions, bold assumptions and then go validate them." "Validation is an product of iterations."	not important	some what important	very important
		When an employee makes a validation mistake, how does the organisation refers to it? As an important lesson learned or otherwise?	"We approach it as an important lesson learned." "Major mistakes will harm someone's career, but then, it hasn't occured in the last couple of years."	fired!	rather make no mistakes	mistakes are essential
	Customer value creation	How did your company provide innovative solutions to the market?	"We produce incremental innovations." "LSM provided us much insight in our customer's needs and their priorities." "Our products are not that innovative, but the way we investigate and pivot is innovative."	no solutions	some solutions	innovative solutions
		To which extent were those solutions creating new business opportunities?	"Priorities can be obtained, so Rabobank knows which features need to be executed to meet the customer's needs." "Rabobank is now able to make more linkages with customers usages by using big data analytics."	no opportunities	some opportunities	new opportunities
Culture	Experimentation	Can you describe the organizational culture (in terms of risk taking, freedom, creativity and agility)?	"Ambidexterity is hard to achieve within a bank. Exploitation is key and processes are becoming more mean and lean in short period of time. We have a conventional culture where people do their job, nothing more, nothing less. Freedom is little when 'how' and 'what' are fully designed." "Exploration is difficult, because people don't take risks." "With our innovation toolkit we have gained more enthusiastic people who are willing to innovate and deliver better products for our customers, so the tides are changing."	exploitation	some what explorative	explorative
		From your perspective, to which extent has the culture changed overtime due LSM?	"We have started since July 2015, so it is hard to speak of an culture change." "What you see is that people are adapting LSM quite easily and are using LSM in different circumstances."	no change	some changes	big changes
		To which extent was your company's culture ready to fully adapt LSM?	"Within certain people there was always an appetite for LSM, you see these people are willing to learn new norms and tend to shift to other methodologies." "In general, our culture is ready for LSM."	not ready	hybrid	fully adaptable
	Responsibility	In which way do employees have mandates?	"We are trying the expand the mandate territory." "Now they have the mandates according to their current job." "Because people take serious decisions in life such as take a mortgage and why can they not make important decisions in their daily job?" "LSM is introduced in October and it is only used in certain departments, so we haven't experienced yet how it is to give people more mandates."	no mandates	limited mandates	full mandates
		To which extent do employees take responsibilities?	"You see that people want to take responsibilities and want to deliver on results." "We are trying to emphasize that people need to more entrepreneurial and that failure and success go hand in hand." "Some people who take responsibilities are used as an example to motivate people to do the same."	no responsibilities	some responsibilities	more responsibilities
	Development	To what extent did LSM change the skills of your employees?	"People have to take more responsibilities to achieve more results." "The skills involved are recruiting, organizing, managing and designing." "LSM is an process and people can oversee the activities and resources that will be used and will be needed." "The mentioned skills have to evolve in order to make much use of LSM."	weak influence	medium influence	strong influence

ABN AMRO

Research subject	Item	Questions	Quotes/Answers	Weak	Medium	Strong
Lean startup management	Entrepreneurship	When an employee has a great idea how can they develop that idea into realisation?	"ABN AMRO encourages employees to make a difference in their job and for our clients. Ideas can be developed with the different innovation experts of the ABN AMRO Innovation Center." "Where they help ideas transforming into prototypes using design thinking and LSM."	no guidelines	some guidelines	innovation process
		How do you keep your employees accountable?	"Employees need to overstep their boundaries and learn as much they can do in small period of time." "This means that employees will make mistakes and most of the time fail." "Within failure comes learning." "We much look at the value of the learnings, not at the downsize of failure." "Nevertheless we hold employees accountable for the failure and this could mean that a project will not be funded."	no accountability	some accountability	pulling the plug
	Innovation	Can you describe the innovation process of your company?	"The process of innovation at ABN is straightforward." "We created a new system where there all stages where work gets done, and there are still gates where decisions are made by the business leaders." "At each gate employees can actually know and work their way further to through the gate. The procedures are designed to help the innovation process to be standardized."	less tangible	tangible	detailed
		In which ways did the LSM contributed on the creation of better products?	"Our normal time to market was 6 months, now we have reduced it to 9 weeks." "LSM taught us that building a real product not always have to take longer than you think." "We used clickable mockups, but you can learn even more when you build a prototype that integrates real data." "So, now we are measuring which clients of ours are using our reports and which of them are reacting on these reports by executing a transaction." "We have created much better products our clients want to use and we lowered our production costs."	small extent	medium extent	large extent
	Management	To which extent does the LSM prevents wasting resources?	"Committees and product owners can slow down the innovation process, now they are involved during each standup and gate meeting, they now have a better alignment during the process." "The biggest waste is time and we are using our time efficiently."	small extent	medium extent	large extent
		How do you measure innovation output?	"We look at the usage rates of our new features and products." "Our clients determine whether a product or feature is successful." "We include clients in our innovation process to develop things according to the needs of our clients." "According the pirate metrics we look at the different rates to see how well or bad clients respond on our propositions? This is something new for our company and employees are more aware that we now can measure things earlier and more accurate then before."	no metrics	vanity metrics	key metrics
		How did the LSM improved the coordination between departments and employees?	"We work with multi-disciplinary teams, where employees from different departments are merged to a development team where the team has a goal." "So, every team member has the same destination and are bonded by that goal." "Employees are now depending on each other instead of doing a little part of the puzzle. These teams are also able to fill in for each other on a certain level." "This makes the team more agile and create better coordination which results in better time management and material handling."	no improvement	improved	strong improvement
		In which way did your company had to change the processes or structures to produce the new product/service?	"So, when we start a new product cycle our structure and processes are quite different than our traditional business lines." "This was a major step for our company to overcome the burden of our traditional structure."	no adaptions	some adaptions	new adaptions
Management Skills	Management skills	What are the primarily responsibilities of managers when implementing the LSM?	"Managers who can think out of the box, creative managers who have great social skills and help employees to extent their knowledge and reward bravery."	intangible	some tangible	tangible
		What type of manager (e.g. visionary) does the implementation of this model require?	"Above all, LSM is facilitating a learning opportunity and that means that managers need to change the value and norms within such a multi-disciplinary team." "Before you going to plant trees, you need to make sure that the ground fertile enough. That is pretty good metaphor for LSM."	traditional manager	less traditional manager	supportive manager
		What doesn't work?	"Once you stop thinking of yourself as a front men of serving new item ID ny that you don't fully understand, you'll stop learning." "Managers must create a safe environment where employees can learn a lot." "When this is a possible hand brake on your progress that you need to carefully avoid."	supportive manager	less traditional manager	traditional manager
	Shit umbrella	To which extent do managers have to be external people, in order to avoid political and hierarchical proportions?	"At ABN AMRO we have installed a few external coaches to help us innovate according to LSM." "Like I said, there is still an traditional structure at ABN and there are directors in place who still have the traditional point of view and who don't know the LSM." "The external employees have certain distance from the company and are hired for their skills." "This means that they are no marionettes of the directors and their only goal is to help ABN to innovate." "This helps us to achieve more impact within our company."	Lots of political and hierarchical proportions	Some political and hierarchical proportions	No political and hierarchical proportions
		How can managers be shit umbrellas for their employees?	"Our managers have the dedication to achieve their goals and experimenting and making prototypes are activities that should not be disturbed." "We created an 'plastic bubble' within our company that has the benefits that no one can interfere and the other side is that prototypes cannot harm the existing business." "These managers are capable of shielding their teams for shit and have the authority to say 'no' to projects."	no shit umbrella	some intervening	no intervening possible
	Collaboration	How are interactions with other departments organized to learn and turn?	"Each team member has the obligation to share their learnings with in the different teams or managers." "Sharing the knowledge makes it easy to comprehend steps and actions and it makes things tangible."	not organised	periodly	scrum wise
Validated learning	MVP's	What are the outcomes in terms of MVP's before and after the LSM?	"After LSM, we are very keen on dismissing ideas or concepts. So, we have less MVP's and those MVP's which are successful are really a few."	more	The same	less
		How do you engage employees to get out of the building?	"We only hire employees who want to go out of the building." "Employees do need the have the proper skills to investigate, but it begins with their vision." "The more they learn, the more they want to back outside the building." "So, for some it creates an information addiction."	no actions	ask	push
	Learning cycles	How important is validation in the innovation process?	"We want employees to make assumptions and validate them. This helps to sketch a ideology and see if their way of thinking is beneficial." "Everyone can validate but the ways of validation are more important." "Which scope do you have and which instrument do you use to validate. Do not underestimate the tooling for validation."	not important	some what important	very important
		When an employee makes a validation mistake, how does the organization refers to it? As an important lesson learned or otherwise?	"We always look at mistakes as lessons. Employees fail and learn lots of interesting things." "The key is to emphasize the good aspects of failures." "Employees do not want to share their failures, but it becomes more and more accepted."	fixed	rather make no mistakes	mistakes are essential
	Customer value creation	How did your company provide innovative solutions to the market?	"We select our focus groups thoroughly and them perform our validation processes." "We want to learn as much as possible from our clients, to align better to their needs but also see other opportunities." "These are existing customers and they want to help us to improve our products. So, co-creation is important to help our customers."	no solutions	some solutions	innovative solutions
		To which extent were these solutions creating new business opportunities?	"Our company is more defining new means to the market." "We improve our existing businesses and products." "By doing so, we are improving our brand, as the new bank." "Banks are always slow, bureaucratic and we want to make banking easy and fun." "So, we developed our insurance app, so customers can send us photos of their car damage within traffic collisions."	no opportunities	some opportunities	new opportunities
Culture	Experimentation	Can you describe the organizational culture (in terms of risk taking, freedom, creativity and agility)?	"At the Innovation Center our culture can defined as an inspiring environment where freedom and creativity is very important." "These are ingredients to start innovation and have employees energized." "We want to make a difference as a bank, so we are selecting the best employees who can help us getting us there."	exploitation	some what explorative	explorative
		From your perspective, to which extent has the culture changed over time due LSM?	"Our culture didn't change over time." "We had a pretty good start, because we are helping lots of startups here in our Innovation Center, so we adapt quite well." "So, LSM hasn't changed our culture, it changed the way we innovate."	no change	some changes	big changes
		To which extent was your company's culture ready to fully adapt LSM?	"We were ready to adapt LSM. Like I said, our culture was formed by startups, because these startups are established in our Innovation Center, so they are helping us to evolve. In return they get funding and space to develop their business."	not ready	hybrid	fully adaptable
	Responsibility	In which way do employees have mandates?	"Employees have much mandate, especially the managers." "If you want employees to innovate, embrace innovativeness, they you must give them freedom and responsibilities." "Managers can determine if they hire external specialists for growth hacking dashboard, or an Java programmer." "Normally all things had to be decided by directors, but managers have now critical roles to be in direct linkage with the teams."	no mandates	limited mandates	full mandates
		To which extent do employees take responsibilities?	"Employees are responsible because they have freedom, and with freedom comes responsibilities. Employees are more dedicated and willing to better align their work with others." "Employees are more engaged because their projects are personal achievements." "So, we have created an entrepreneurial environment."	no responsibilities	some responsibilities	more responsibilities
	Development	To what extent did LSM change the skills of your employees?	"LSM created more understanding and telling the truth." "LSM learned us that communication is very important and employees cannot hide behind rules and regulations." "Is caused better communication skills, eagerness to learn, being better prepared, to be agile and helping clients and colleagues."	weak influence	medium influence	strong influence

Appendix 4: Empirical **data** new insights

ABN AMRO	Subject: Engagement
How do yo define failure?	'Failure is the situation when persons or teams do not achieve their goals." "This is the logical consequence when employees are learning." "Within banking, there is little room for failure, but we have given employees freedom to fail."
To which extent does personal failure blocks improvement?	'We haven't measured these situations, but from a personal level I can tell that failing can be difficult when money spended on project and it doesn't resulted in the expected outcome." "Then employees can interpret it as a personal failure." So, it can block the personal improvement and from there the project improvement."
How do you engage people to go to the next project, after a failure?	"The key is to emphasize the good aspects of failures." "We constantly emphasize that employees need to learn from mistakes as soon as possible to prevent wasting more resources for ABN AMRO." "Failing is important to learn stuff" and "When people feel that failing is learning, they will have a more positive association with failing." "At ABN AMRO we developed an great roadmap, where projects, budgets, spendings, deliveries are incorporated." "This roadmap consists of several projects that will contribute on reaching a our strategic goals." So, teams and employees can see the importance of the project and their role." "To improve knowledge and collaboration we connect several teams with different projects." "The projects are tools for realizing their goal. So, the risks are more spread over different projects."
What have you done to prevend the inconvenience of failure?	'In the occasion that our people are feeling down after a project has failed, this occurs in situations where lots of time is invested and the failure comes as a surprise because they do not saw the bottlenecks.""In order to avoid surprises which lead to failure, we use different tooling to prescribe possible outcomes." This makes it easier to make forecasts and make up concepts and business cases." "Great to use are Kanban charts." "This proved to be an excellent way to start improvements, identify problem areas, bottlenecks and required time to finish a project."

ABN AMRO	Subject: Culture change
On which management level the decision was made to use LSM?	'The decision was made by our Board of Directors". "ABN AMRO isn't the same bank anymore as during the crisis." "We want to be entrepreneurial and progressive." "Our Board sees the benefits of LSM, so they gave freedom, but wanted results in return."
Why management chose to use LSM?	' LSM gained lots of interest by our Board of Directors." "We are working with startups and the collaboration changed our way of innovation." "We learned that changing our innovation process was important to gain results and learn very quickly." "Our Board knows that the world is changing and other capabilities are needed." " They realised that they don't have the sufficient human capital nor the knowledge to steer innovation with immediate effect." So, we incorporated two startups and we assembled external parties to help us implementing LSM."
Which goals management want to achieve with LSM?	'We want to make impact with our innovations for our clients, therefore we have to choose other strategies to reach this goal."
To which extent do other departments use LSM?	'Our Board of Directors introduced LSM to all the departments within Innovation & Strategy, to make a big change in how to steer the company." "One way for all."
What were the consequences choosing LSM as strategy for the company?	'Soon after LSM the processes changed and during the change we experienced that entrepreneurship and validated learning became more important." "Then we came to realization that some people were blocking the progress." "With the results that traditional banking managers and employees left or were asked to leave due their lack of competence and/or knowledge." "Soon a great change of our culture occured." Thus, hiring the right people pays off."

Rabobank	Subject: Culture change
On which management level the decision was made to use LSM?	'The task of Innovation management is to seek and internalise new innovation strategies." "The implementiation of LSM had great attention within Innovation Managemen." "It was decided by the Head of Rabobank Innovation Management and he has 12 months to proof the benefits of LSM to our Board."
Why management chose to use LSM?	"LSM showed huge impact within different companies, mainly the startup scene." "So, Rabobank Innovation Management wanted to change their current innovation process by adopting the LSM principles." "This as counter reaction referring on our current innovation processes."
Which goals management want to achieve with LSM?	'We are striving for 9+ experience within our clients". "If we can develop better products which our customers perceive as outstanding their exeperience with Rabobank will become great, resulting in a 9+."
To which extent do other departments use LSM?	'Not every department is working with LSM, only Innovation Management." "Now, Innovation Management is developing roadshows and toolkits to promote new ways of innovating which goes hand in hand with entreprneurship." "Everybody likes the LSM principles during the roadshows, but there is no urgency within the IT and Retail teams to use LSM." "In a cultural setting which has been maintained for years, it's really hard to change the culture." "Especially when employees are told what to do, so as long as the Board of Directors is not prescribing managers and their departments to work with LSM, they won't do it."
What were the consequences choosing LSM as strategy for the company?	" The Board of Directors has a normative, traditional view how to innovate within a bank." "The Board of Directors first want to see evidence if LSM works at Rabobank Innovation, before declaring that the whole IT department have to work with LSM. " "The first benefits using LSM are visible and tangible." "Our employees are showing explorative behaviour, better structures and lean processes have been installed." "Four internal startups have worked the past 6 months woith LSM and their MVP's have been succesfull." " So we are making better products."