Innovation Management in Business-to-Business Software as a Service Startups:

Investigating the Lean Startup Methodology and its Shortcomings around Selecting Ideas

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Abstract

Managing innovations is a well studied success factor for companies and organizations. This research focuses on the recently established Lean Startup Methodology (LSM) and the obstacles of implementing it in early- and later-stage business-to-business (B2B) Software as as Service (SaaS) startups. The scarcity of academic research around this framework, in contrast to its popularity, motivated the researchers' aim to provide a better understanding on how it could be adapted to better fit the needs of these companies.

Following an interpretivist paradigm, this qualitative research uses a literature review and semi-structured interviews for its purposes. Interviews were conducted with six individuals at four different early- and late-stage startups. The focus was on understanding the realities of working with innovation management and the different approaches at early and later stage startups. Startups face an abundance of ideas regarding what to do next, a hypothesis confirmed with this study. It is the researchers' belief that the LSM does not provide sufficient tools for organizations to make an idea selection decision without committing too many resources initially. Lastly, the importance of product ownership for an effective innovation management process was validated.

In conclusion, we present the need for an updated Lean Startup Methodology with a dedicated selection step to validate an idea early in the process. This contributes to the theory of innovation management and its practical implementation. The identified gap in academic research around frameworks tailored towards these types of organizations provides a good starting point for future research.

Keywords

Innovation management, the lean startup methodology, early-stage startups, idea selection, Software as a service

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Glossary

Innovation - "*The introduction of a new good - that is one with which consumers are not yet familiar - or a new quality of a good.*" (Schumpeter, 1934 p.66)

Startup - "*a human institution designed to deliver a new product or service under conditions of extreme uncertainty*" (Ries, 2011 p. 8)

Early-stage startup - For the purpose of this thesis, we define an early-stage startup as a company with 20-30 employees. Furthermore, the organization has launched a product and is focused on customer acquisition as well as reaching breakeven.

Late-stage startup - For this thesis, we define a late-stage startup as a company with 70 or more employees. Furthermore, the organization has a well known product, gained market traction and is looking to branch into new markets.

List of Abbreviations

B2B - business-to-business, meaning businesses making commercial transactions with other businesses.

CD - Customer Development

CEO - Chief Executive Officer

CIO - Chief Information Officer

CTO - Chief Technology Officer

ESS - Early-stage startup

FEI - Front End of Innovation

FFE - Fuzzy Front End (of innovation)

KPI - Key Performance Indicators

LSM - Lean Startup Methodology

LSS - Late-stage startup

NCD - New Concept Development

NPD - New Product Development

OMTM - One Metric That Matters

1 Introduction

The introduction touches on the development of innovation management processes and models in the past. Following, the types of innovations referred to in this research are defined. Furthermore, the aim and objective for this thesis will be presented and delimitations in terms of scope and depth will be established.

1.1 Background

A company's ability to continuously innovate is widely regarded by many (Baumol 2004; Porter, 1990; Leifer et al., 2001) to be a driving force behind long-term success in the marketplace (Tidd & Bessant, 2009). The difference between a firm like Kodak, which lost its once dominant market position, and one like 3M, whose success spans more than a century, has been attributed to innovation strategy (Pisano, 2015). Not only is it important to make incremental improvements to the product portfolio, but also to find new opportunities for not-yet established markets. As Christensen (1997) covered in *The Innovator's Dilemma,* incumbent companies that do everything "right" can still fail or lose their market leadership to new entrants by overlooking what he calls "disruptive innovations". These disruptive innovations are often for a completely new market, which may seem to be less attractive to the incumbents (Christensen, 1997). On the other hand, Christensen (1997) also describes the phenomenon of low-end disruption in an existing market.

Innovation management covers the entire process of product development including conception, execution and analyzing in retrospect. From an academic point of view, it overlaps with other disciplines. Industrial engineering, a form of engineering specifically aiming to optimize processes in an organization, uses innovation management as a lens to look at existing practices. Industrial economics and management, the combination of technology and economics, relies on innovation management to bring new inventions to life. But the biggest similarities are to be found with the field of entrepreneurship and innovation. The process of bringing inventions to the market through entrepreneurial activities is quintessential dependent on innovation management.

Establishing and implementing an innovation management strategy is not an easy task, since it involves many moving parts and requires a shift in mindset from the top management team to commit fully to the strategy (Hamel, 2006). Moreover, the different types of innovations need to be considered. For businesses to succeed, they need to focus on a spectrum of different types of innovations, including: improving the core products for existing customers, expanding their business model (adjacent), and transformational innovations for markets that do not yet exist (Nagji & Tuff, 2015).

Google is a good example of a company that systematically works to improve across its entire innovation portfolio. The company spends 70% of its innovation activity related to

core initiatives, 20% on adjacent innovations (expanding into "new to the company" businesses), and 10% to transformational activities, which means developing breakthroughs for markets that do not yet exist. (Nagji & Tuff, 2015).

The difference in resources between Google and a 20-employee startup is evident. Startups that are yet not profitable experience a higher rate of urgency due to the "burn rate" of capital - "*the money a company spends each month exceeding its revenues*" (Hulsink & Dons, 2008 p. 10). If they fail to make a profit and cannot bring in more external capital, they will go out of business (Blank, 2014). Therefore, due to the "burn rate", focus around activities outside the current business model might often be discarded in these early-stage enterprises.

In general, innovation management frameworks are designed for corporations with more resources, structure, and complexity than startups. However, in recent years, models that could be adapted by startups have been developed, such as the Customer Development (CD) model by Blank (2007), NexGen Stage-Gate model by Cooper (2008), and the Lean Startup Methodology (LSM) by Ries (2011), to give a few examples. But are these frameworks being incorporated by startups and, if so, with what kinds of results and challenges?

1.2 Types of Innovations

There is a range of definitions of 'innovation' in the scholarly community. In this thesis, the definition made by Schumpeter (1934, p.66) will be used:

> "*The introduction of a new good - that is one with which consumers are not yet familiar - or a new quality of a good*"

There is an abundance of typologies of innovations. In this thesis, focus will be on incremental, adjacent, radical and transformational innovations (described below).

Incremental

Incremental innovation can briefly be described as "*doing what we do but better*" (Tidd & Bessant, 2009, p. 27). These day-to-day changes to the offerings have a relatively low degree of novelty. These innovations are small, incremental improvements to already existing products and services. This is for our purposes the same as Nagji and Tuff's (2015) terminology of 'core' innovations.

Adjacent

Adjacent innovation can be described as leveraging something that the company does well (such as incremental innovations) into a new space (Nagji & Tuff, 2015). In other words, this means to expand from existing business into "new to the company" business. Adjacent innovations allow the company to leverage existing capabilities and put them to use in different contexts.

Radical

Compared to incremental innovation, radical innovation "*transforms the relationship between customers and suppliers, restructures marketplace economics, displaces current products, and often creates entirely new product categories*" and can "*change the game"* (Leifer et al., 2001). This also means these innovations are by definition a higher risk for the organization. However, Leifer et al. (2001) argue that radical innovation is required for organizations to achieve long-term growth.

Transformational

According to Denning (2005), "*Transformational innovation entails a transition from a mode of operating that is known and secure to one that is unknown and potentially chaotic*" (p. 11). To achieve this, organizations are required to offer something fundamentally different from what they are used to, which in turn leads to introduction of offerings that "*change the business landscape by providing a dramatically different value proposition*" (Denning, 2005, p. 11).

1.3 Aim and objective

This thesis is built around the hypothesis that available innovation management frameworks are lacking important considerations and tools catered towards early-stage startups (ESS). Looking at the research problem more in depth and taking the Lean Startup Methodology (LSM) by Eric Ries (2011) specifically into account, the following primary research question emerged:

> *How can the Lean Startup Methodology be adapted to better fit the nature of B2B SaaS startups?*

Over the course of the research, a secondary question emerged:

> *What can early-stage SaaS B2B startups learn from the innovation management processes of late-stage startups within same sector?*

To answer these questions, a thorough literature review of innovation management frameworks was conducted. Interviews with early-stage and late-stage startups in the B2B SaaS sector were used to identify their current innovation management processes and to achieve a deeper understanding of the needs and requirements for these organizations.

1.4 Delimitations

The decision to focus on B2B SaaS startups assumed that their business model enables a unique growth opportunity. By leveraging the distribution effect of the internet, SaaS companies can achieve enormous growth and scalability in a relatively short amount of time, as soon as "product/market fit" (Andreessen, 2007) is achieved. The research was built on the assumption, that this rapid growth trajectory provides said companies with

unique challenges in managing their innovation processes. Furthermore, this research focuses on the challenges of companies that currently employ 20-30 people and are on the way to significant growth (e.g., employing more than 70 people). Startups that do not fit these parameters have been left out of the scope for this thesis.

The frameworks and methodologies that will be covered are: Lean Startup Methodology (LSM) by Ries (2011), Customer Development (CD) by Blank (2007), Fuzzy Front End (FFE) of innovation (Smith & Reinertsen, 1991) and the selection process from the simplified innovation management framework by Tidd and Bessant (2009). The NexGen Stage-Gate by Cooper (2008) and New Concept Development (Koen et al., 2001) will be briefly mentioned, but not covered thoroughly. The focus will be on product innovation, which represents changes to the product or service that the organizations are offering (Tidd & Bessant, 2009). Other innovation types, such as process, paradigm or position, are left out.

2 Literature Review

First, an overview of the conducted keyword search in the academic search engine ScienceDirect and the identified gap in the existing body of research is presented. In the subsequent parts, the Customer Development model by Blank (2007), the Lean Startup Methodology by Ries (2011) and the Fuzzy Front End by Smith and Reinertsen (1991) are reviewed. After establishing gaps in the research on CD and LSM, the connection to the simplified model for innovation processes by Tidd and Bessant (2009) is made and a review of the mentioned frameworks follows.

To conduct a literature review that is transparent and purposeful, a multi-step process was chosen. In the first step, the academic search engine ScienceDirect was used to find potentially suitable publications. ScienceDirect is widely used for academic research and provides advanced options to narrow down search queries and was therefore deemed sufficient for this research. An initial selection of keywords was chosen from the research problem and relevant work. Since the initial number of results, see table 2.1**,** was by far too big to be analyzed within the scope of this research, the results were further narrowed down by an increasing the level of detail displayed in the keywords. Given the topic of innovation management and its proximity to startups, this was expected. The subsequent keywords were chosen from an initial overview that was gained by looking at *Managing Innovation* (Tidd & Bessant, 2009) and *The Lean Startup* (Ries, 2011). The final number of results was manageable in terms of quantity and analyzed in depth with a full-text evaluation of their relevance to the primary research question.

In table 2.1 below, the quantification and winnowing of the search results is shown:

Keywords	Number of Results
innovation* AND manage* AND startup	11.684
("Innovation management" or "Managing innovation") AND startup*	795
("Innovation management" or "Managing innovation") AND startup* AND “Lean Startup”	19

Table 2.1 - Keyword search

The analysis of all 19 results showed no relevant results to answer the research questions, especially towards how the implementation of the LSM can be problematic at early-stage

startups. Therefore, the researchers decided to not include these findings in the in-depth literature review.

2.1 Customer Development

Blank (2007) created the concept of customer development (CD) in his book, *Four Steps to the Epiphany*. The key idea behind CD is that there are no facts 'inside the building', meaning that companies must 'get out the building' and test hypotheses with customers because otherwise planning in the uncertain product development environment is akin to guessing (Blank, 2007).

His CD model contains four steps: 1) customer discovery - understanding the customer problems and needs, 2) customer validation - identifying a scalable and repeatable sales model, 3) customer creation - launching the business and driving user demand, and 4) company building - making an efficient organization around the findings (see figure 2.1**)** (Blank, 2007). As a result of this process, companies have to question their core assumptions around the business model by applying engineering or scientific methods in order to validate ideas (Blank, 2007). See figure 2.1 below. In other words, CD teaches that rather than assume your beliefs about your business to be true, you should apply an engineering, or scientific method, to what is not a scientific endeavor (building a business), to validate the ideas.

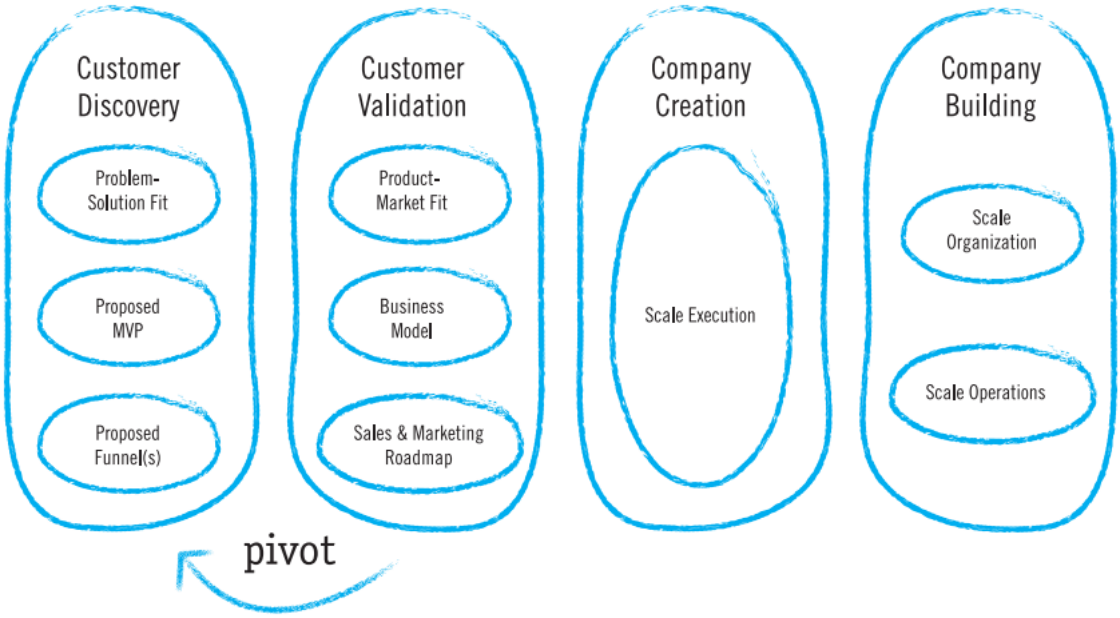

Figure 2.1 - Steve Blank's Customer Development process. Illustration by Cooper & Vlaskovits (2010)

A unique feature of CD is the extensive focus, early in the product development process, on interacting with customers. Most of the process is spent in direct contact with customers

or potential customers and other people outside of the company, with testing hypotheses and acquiring knowledge in mind (Blank & Dorf, 2012). The whole idea behind this process is to find "product-market fit," which broadly means to have a product that fits the needs of the market (Andreessen, 2007).

Another key feature of CD is releasing new products that have sufficient features (or "minimal requirements") to satisfy early adopters and gather continuous feedback. This is called "minimal viable product" (MVP), and was popularized by Ries (2011).

Blank is not the only promoter of the CD model. Others such as Ries (2011), Cooper and Vlaskovits (2013) and Maurya (2012) are also strong advocates of CD method, and the latter have integrated CD into their own frameworks and methods.

2.1.1 Customer Development Critique

York and Danes (2014) note that entrepreneurs tend to face time constraints, be overly active and therefore tend to rely on intuition in the CD testing phase. They argue, *"Entrepreneurs often lack important information regarding a decision, fail to notice available information...*" and those factors "*...may result in poor decisions*" (p. 28). Moreover, several biases affect the decision-making process for entrepreneurs (York & Danes, 2014). A few of the ones that seem to carry most risk for the CD process are:

Selection bias - entrepreneurs tend to look to friends, colleagues and known sources for gathering data and testing hypothesis. It has been shown that entrepreneurs tend to gravitate to comfortable and confirmatory sources (Holcomb et al., 2009).

Representativeness bias - data tend to be generalized from a small and non-random sample of people in a dynamic startup environment. Representativeness bias in combination with selection bias can lead to CD information gathered to be severely compromised (York & Danes, 2014).

Confirmation bias - people tend to interpret information in a way that confirms their belief (or in the case of CD, hypothesis). If the entrepreneur believe that a problem exists, she may overweight evidence that confirms the existence of the problem (Mynatt et al., 1977).

2.2 Lean Startup Methodology

The Lean Startup Methodology (LSM) is an innovation framework developed by Eric Ries (2011). LSM is focusing on giving software companies the tools to develop new products and services to grow their business by allowing fast iterations through what he calls the "build-measure-learn" feedback loop (Ries, 2011). Ries defines a startup as "*a human institution designed to create new products and services under conditions of extreme uncertainty*" (Ries, 2011, p. 8). This in turn means that a startup, according to Ries' definition, is not necessarily the stereotypical small group of people sitting in a garage

working on the next big thing, but could also exist within an established corporation. This is another fundamental principle from the Lean Startup Methodology: "Entrepreneurs are Everywhere" (Ries, 2011).

Developing this methodology, Ries has been heavily influenced by Blank's Customer Development model (2007), Lean Manufacturing developed by Taiichi Ōno (1988), Agile software development (Martin, 2003) and Design Thinking (Brown, 2009). In other words, Ries did not create something new from scratch, he leveraged already existing models in a new way.

When it comes to Lean Manufacturing, the goal is to eliminate waste in the production process. This includes, but is not limited to, unnecessary use of material, storage space, workforce as well as expenses (Ōno, 1988). Similarly, the goal of LSM is eliminating waste by making sure to not spend time and money on building products that the customers do not want in the first place.

Agile development is known for addressing the problems of rapid change, which is especially common within software development (Cockburn & Highsmith, 2001). Some of the fundamental principles of Agile development are to make teams more effective by: improving information flow between people; reduce time from decision making to seeing consequences of that decision; place people physically closer to each other; have information available for the team for quick feedback; and increase the overall morale of the team (Cockburn & Highsmith, 2001). In the LSM, Agile development is used on the technical side of the MVP and product builds.

Compared to other models of product development, such as the Stage-Gate model developed by Cooper (1990), the LSM has a more agile approach. The Stage-Gate model has a linear 'waterfall' approach for product development, and has been frequently used throughout the 20th century. In the waterfall approach, the process has a set number of stages that are followed, step-by-step, with little or no customer feedback. The LSM's agile approach is similar to the one in agile software development, in which customer feedback is gathered throughout the process, which includes continuous iteration. Here the aim is to "*satisfy the customer through early and continuous delivery of valuable software*" (principles behind the Agile Manifesto, n.d.). This can be seen as a major improvement over the waterfall method - especially for software development - since it allows the practitioners to be "*fast, agile and efficient*" (Blank, 2015).

2.2.1 Validated Learning

The core principle of lean, as well as for LSM, is to create more value for customers with fewer resources. In LSM this is achieved by 'validated learning' - a process in which hypotheses about the market and customers are tested using an agile approach. The findings of each test fuel future iterations in what is a larger learning process. The core concept of

LSM is to eliminate as much uncertainty as possible from the product development process (Ries, 2011).

2.2.2 Build-Measure-Learn Feedback Loop

One of the key components of the LSM is the 'build-measure-learn' feedback loop (Ries, 2011). This is a continuous process in which the goal is to maximizing learning for the organization. Ries (2011), like Blank and Dorf (2013), promotes releasing minimal viable products (MVP). By releasing a MVP, companies can gather early feedback from customers and make an educated decision about when to 'pivot', which means to do a structured course correction to test new hypothesis about the product, or 'persevere', meaning staying on the same course and continuing to iterate on the first hypothesis (Ries, 2011). The MVP could be anything from a website or landing page to a brochure or clay prototype of a physical product, with which a pre-determined goal should be set and measured. When the feedback has been gathered, and measured, companies learn from the results and decide if they should continue on the same path, or pivot and test a new hypothesis.

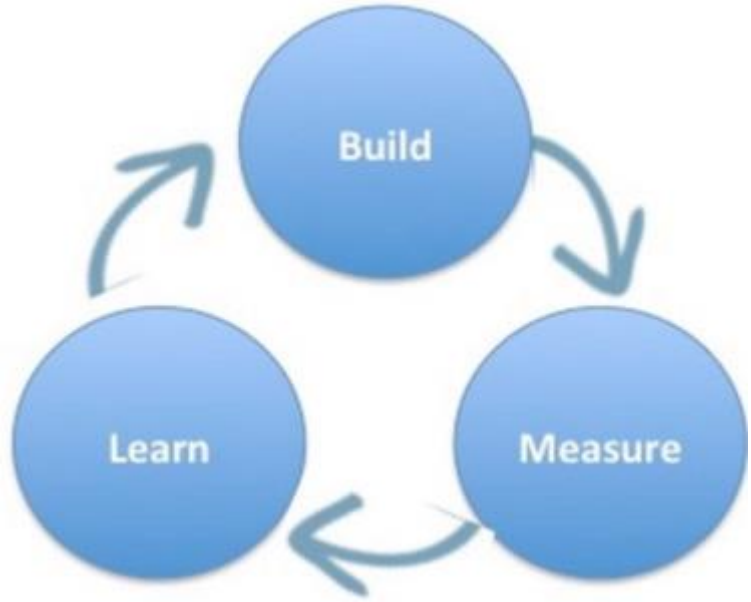

Figure 2.2 - Build-Measure-Learn feedback loop (Blank, 2015)

2.2.3 Innovation Accounting

Measuring the right things presents a challenge to startups due to the abundance of information. Venture capitalist Shawn Carolan stated "*Startups don't starve; they drown.*" (Ries, 2011, p. 209). Ries (2011) promotes 'innovation accounting' - a new way of measuring the progress and outcome of an innovation. Compared to traditional accounting, which works best with already established products, innovation accounting takes more than financial ratios, such as return on equity or operating margins, into account. It measures

what is of more importance for new products and innovations, such as customer retention and usage patterns (especially for SaaS companies), which allows the entrepreneurs to make a more in-depth analysis of what is working and what is not.

Innovation accounting works in three steps (Ries, 2011): 1) establish a baseline by using an MVP to measure the status of the company; 2) tune the engine through experiments and see what can be improved; 3) pivot or persevere based on the findings. The faster this process can be completed, the more successful the venture. Croll and Yoskovitz (2013) promote the use of David McClure's 'Pirate metrics' - AARRR - for innovation accounting (see figure 2.3 below).

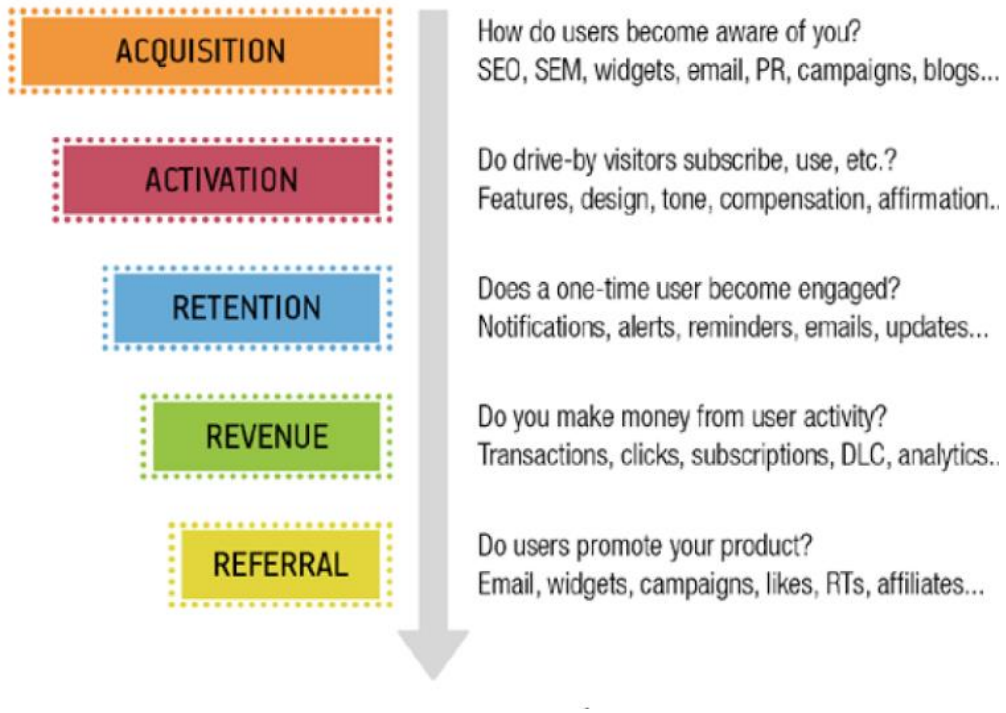

Figure 2.3 - Croll and Yoskovitz's (2013) interpretation of David McClure's pirate metrics

In table 2.2 is a brief description of the elements, functions and relevant metrics to track for the five elements, adapted for SaaS businesses.

Element	Function	Relevant metrics
Acquisition	Utilizing a variety of means to generate attention	Cost per click, search results, open rate, cost of acquisition, traffic, mentions (media)

Activation	Enroll users into the service	Signups, completed onboarding processes, used the service once
Retention	'Stickiness' of service by convincing them to come back repeatedly	Engagement, time since last login, daily/monthly active users, churn
Revenue	Business outcomes (subscriptions)	Customer lifetime value
Referral	Virality and word-of-mouth invitations	Invites sent, viral coefficient

Table 2.2 - Based on Croll and Yoskovitz (2013), adapted by the researchers for SaaS businesses

It is vital for startups to measure the right metrics to achieve a sustainable business (Ries, 2011). Furthermore, Croll and Yoskovitz (2013) argue that early-stage startups should focus on the 'One Metric That Matters' (OMTM) and define the term as "*the one number you're completely focused on above everything else for your current stage*" (p. 56). This metric will change over time, however, but allowing the metric to be the same across multiple projects will allow you to compare it more thoroughly after each iteration of the build-measure-learn feedback loop. In addition to the OMTM, companies should track and review multiple other metrics of importance as well, called key performance indicators (KPIs) - especially as the startup is scaling and the different teams have different responsibilities (Croll & Yoskovitz, 2013).

2.2.4 Critique of the LSM

The LSM has gained worldwide recognition that entails gatherings such as the 'Startup Weekends' that are hosted across the globe, and the methodology is being taught at more than 25 universities (Blank, 2013). Furthermore, Gartner has estimated that, by 2021, more than 50% of established corporations will using lean startup techniques to "*increase the pace and success of business transformation*" (Panetta, 2016). However, there is still an absence of scientific evidence of the advantages of adopting the model (Patz, 2013). Critique of the methodology has been anything from that the methodology is too engineering oriented and not focusing on the business aspects to that the concept of learning is not incorporated adequately (Heitmann, 2014).

The LSM assumes that the entrepreneurs have an untested hypothesis, and the build-measure-learn feedback loop will help them to confirm whether the hypothesis is correct. York and Danes (2014, p. 27) shed some light on the issues with these entrepreneurial hypotheses: "*The ultimate goal is to make good decisions. Yet, as is well known, true*

Bayesian decision making requires significant amounts of data, which the entrepreneurial environment may not provide, nor the entrepreneur be able to implement." Moreover, York and Danes (2014, p. 27) criticize Blank's hypothesis testing methods for being informal and that they "*...tend to rely on intuitive thinking...*". This is a result of the time and cost constraints frequently experienced by entrepreneurs, and according to Stanovich and West (2000), intuition as a decision making bias is fast, automatic, effortless, emotional and implicit (also referred to System 1 thinking by Kahneman (2012)).

The LSM also assumes that the entrepreneurs already have a hypothesis that should be tested. However, as will be discussed below, the process of generating and selecting ideas may be one of the most important stages in the innovation management process (Koen et al., 2001) and should not be assumed to be something that already is done adequately by entrepreneurs.

2.3 Fuzzy Front End

The "fuzzy front end" (FFE) of innovation, a term popularized by Smith and Reinertsen (1991), explains how the earliest stages - the period from identifying a new product opportunity to when it enters the "formal" development - in the product development process are the most prone for setting the success rate for the entire project. Compared to the other more formalized stages of the development process, the understanding of the fuzzy front end is limited (Reid & Brentani, 2004). It has been referred to as the "Valley of Death" (Branscomb & Auerswald, 2001; Markham, 2002) due to organizations' repeated failures to commercialize technologies as a result of overlooking the 'fuzzy' step before the traditional product development steps. Smith and Reinertsen (1991) argue that the greatest time and expense savings can be gained by investing in this early stage of the product development process. This is due to the relatively low cost of idea generation and the significantly higher cost of actually implementing the ideas (Urban & Hauser, 1993).

More recent research within the FFE has been done by Koen et al. (2001), who suggest updating the terminology to "front end of innovation" (FEI), as they argue that this stage is indeed not that 'fuzzy' and can be studied through the lens of the New Concept Development (NCD) model (see figure 2.4**)**. The NCD model breaks down the FEI into three key parts: the engine; the wheel; and the rim (Koen et al., 2001). The engine - organizational attributes such as strategy, vision, senior and executive-level support - is what gives power to the whole front end process. The inner part of NCD - the wheel - has five activity elements: opportunity identification; opportunity analysis; idea generation or ideation; idea selection and concept definitions. In this thesis, the focus is on the idea selection stage. Rather than being a sequential process, ideas flow between these five activity elements and iterate throughout the process. The third and last part of the NCD - the rim - includes the environmental influencing factors that the organization cannot

control, such as regulatory changes, organizational abilities, and trends in the world which affect the five activity elements.

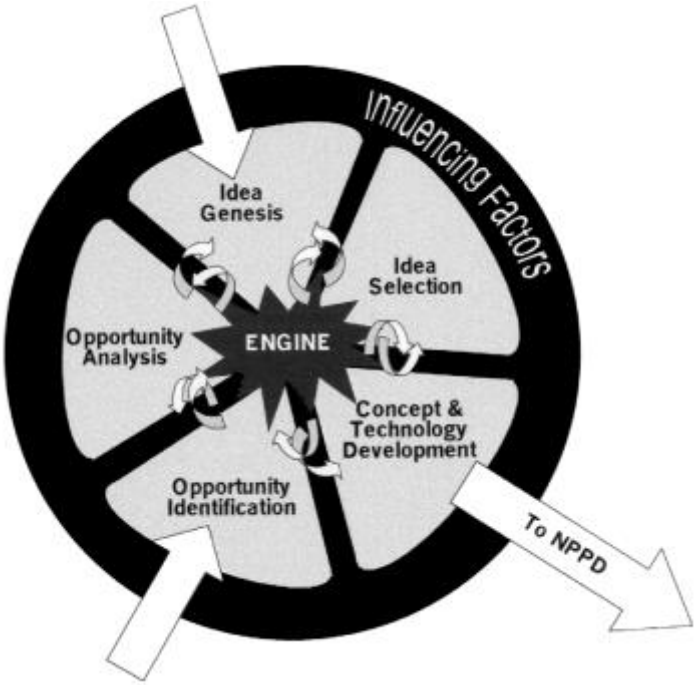

Figure 2.4 - New Concept Development (NCD) model (Koen, et al. 2001)

As Koen et al. (2001) highlight, most businesses have an abundance of ideas for products. Therefore, the process of idea selection becomes critical in generating the most business value. However, estimates of financial return are often troublesome due to the limited amount of information available at this stage (Koen et al., 2001), and other measurements such as organizational capabilities, unique advantages, and market and technology risk should be considered.

The Importance of Idea Selection

Following the arguments presented by Koen et al. (2001), the importance of selecting the right idea to pursue is vital for a company's success. Furthermore, the literature review has established that the LSM assumes the right idea to move forward in the product development process is clear, or that the 'feedback loop' is a sufficient validation method for the abundance of ideas available to entrepreneurs. As acknowledge by Blank (2014), CD and LSM start with a founder's vision and a hypothesis to test. As discussed previously in the 'Fuzzy Front End' (FFE), this initial step of the innovation management process is the most prone for setting the success rate for the entire project (Smith & Reinertsen, 1991), but is often overlooked by organizations (Branscomb & Auerswald, 2001; Markham, 2002). Additionally, the greatest time and cost savings can be gained by investing in this

stage of the process (Smith & Reinertsen, 1991). In the light of the importance of this step, the researchers argue that already existing visions and hypotheses may not be a sufficient foundation to build the process upon.

The LSM does not emphasize the importance of selecting the right idea to feed into the process of 'build-measure-learn' and furthermore does not provide the tools to do so. The available academic work within the scope of this research does not provide a substantial critique of these shortcomings in the Lean Startup Methodology.

2.4 Simplified Innovation Process

Tidd and Bessant's (2009) simplified innovation process will be briefly covered to give an overview of their take on the innovation management process. A more in-depth look at the selection process - arguably a missing process in the LSM - will be conducted in the next steps. The focus will be on how uncertainty relates to resource commitment; implications of selecting radical ideas to pursue; the importance of having an innovation portfolio; and lastly the innovation selection space - how does the type of innovation and environmental complexity affect the decision making process of which idea to pursue?

Professors Joe Tidd and John Bessant present a simplified framework that highlights the most important questions around the issue of managing innovation in an organization (Tidd & Bessant, 2009). The framework itself and the research surrounding it are considered landmarks in the field of innovation management.

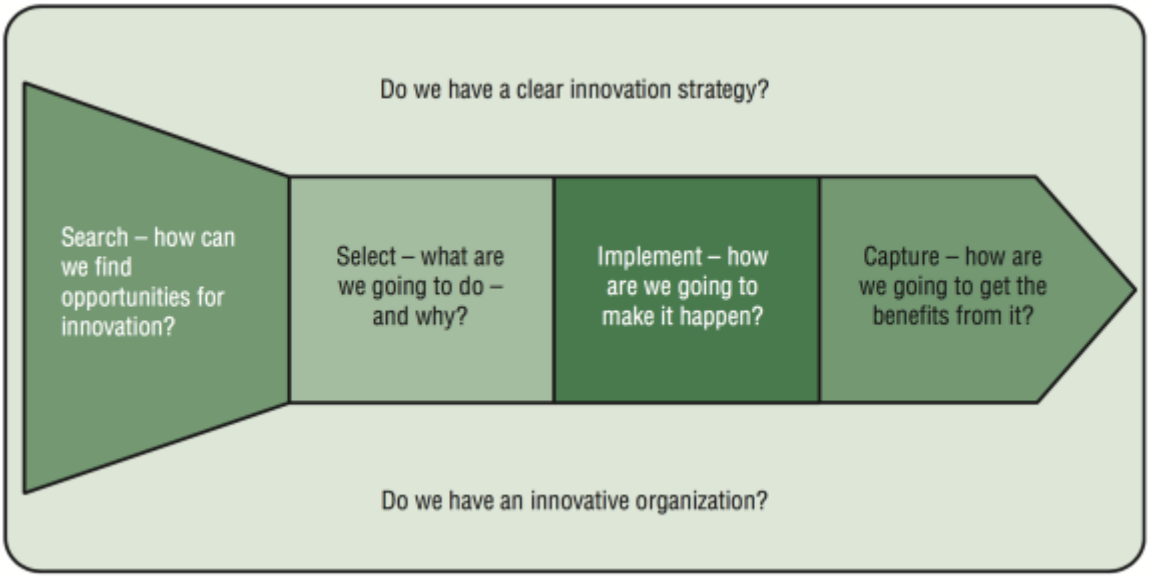

Figure 2.5 - Simplified model of innovation process (Tidd & Bessant, 2009)

The individual steps are summarized below (Tidd & Bessant, 2009):

- Search - exploring the environment to identify emerging opportunities for and threats to change
- Select - deciding on which of these possibilities to pursue
- Implement - turning the resulting idea(s) into an actual product/service or proof of concept
- Capture - collecting monetary gains and organizational learning from the introduced product/service

To further investigate the importance of selecting the right ideas to pursue and how the LSM could be adapted to better fit the needs of SaaS startups, the second step in this framework - select - will be looked at closely because of the analysis made previously in Fuzzy Front End.

This stage of the innovation management process is vital for setting the success of the entire project. When implementing incremental innovations, prior knowledge about the market and technology is available. As a result, the risk involved in pursuing new ideas can be assessed fairly accurate. However, implementing radical ideas presents the challenge of lack of information about the potential market reaction. This leads to uncertainty and increasing risks in the development process.

2.4.1 The Funnel of Uncertainty

By investing in acquiring early knowledge through R&D, market research, analysis of competitors, trend spotting and other mechanisms, the decision making process can be easier to manage (Tidd & Bessant, 2009). However, this mechanism increases the necessary resource commitment for the process, leading to higher costs. The right balance between investing to reduce uncertainty and taking the risk of pursuing the wrong innovations must be found. As discussed, the LSM approaches this problem with testing out ideas by building MVPs based on the entrepreneur's hypothesis with arguably to little prior research on the feasibility of the idea - the process is the validation in itself. Tidd and Bessant (2009) disagree with this approach fundamentally, because acquiring knowledge beforehand is central to the selection process in their opinion. However, it is noteworthy that Ash Maurya (2012) describes some prior analysis in his Running Lean process, which is related to the LSM. Maury (2012) argues that before focusing on Product/Market fit, for any innovation the question whether it solves a problem customers have and whether they are willing to pay for a solution, must be answered. He uses the term Problem/Solution fit for this process, which arguably presents a selection step prior to testing ideas with MVPs as described in the LSM.

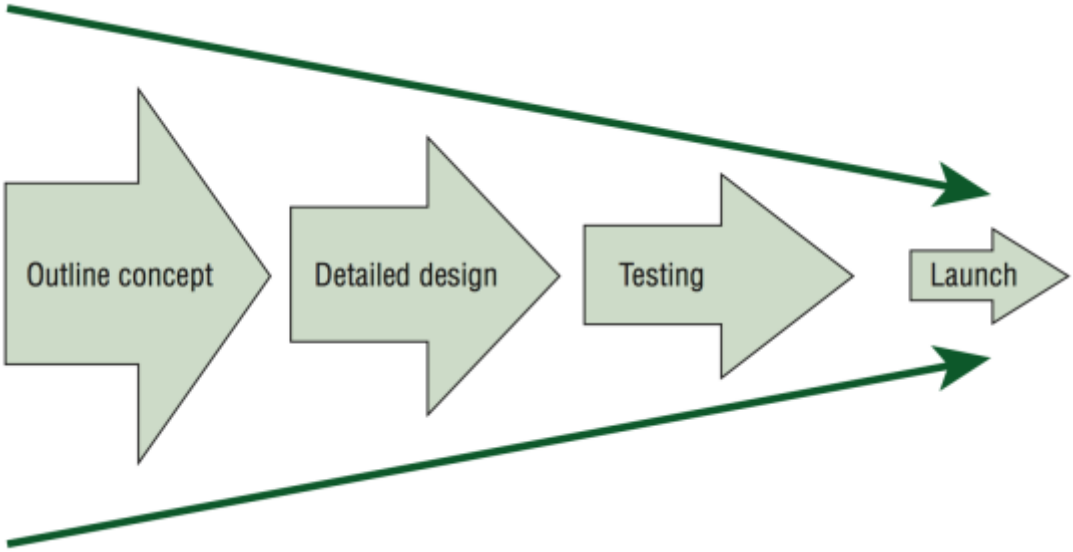

Figure 2.6 - Funnel of uncertainty by Tidd and Bessant (2009)

As shown in figure 2.6, the step of testing an actual idea comes after outlining the concept and developing a detailed design for the innovation. This process is well suited especially for implementing incremental innovations, since it involves comparing new ideas with existing products or implementations, which allows for a clear set of criteria to measure against - both in the beginning and during the progression of the project (Tidd & Bessant, 2009). Ries (2011) on the other hand does not distinguish for which types of innovations the 'feedback loop' is made for.

A possible implementation of the approach outlined by Tidd and Bessant is the Stage-Gate process. Particularly associated with its founder Cooper (1994), it quickly became one of the most commonly used frameworks for implementing new projects. It revolves around implementing clear steps in the process at which a decision around "abort or proceed" is made. Griffin and Rosenau (1996) established that this represents an effective approach to not waste money on unfruitful projects. In these steps a risk/reward assessment justifies whether to move forward with the project. This environment works heavily in favor of incumbent companies, which have clearly defined criteria and actors inside the organization who need to be involved in the decision process (Griffin, 1996). Blank (2014) argues that highly standardized approaches like a Stage-Gate review do not work well for an ESS. The product management tools assume that, for example, the product has gained traction in the market, a viable business model has emerged and what the customers value about the company's product is known (Blank, 2014). Cooper (2014) addressed the criticism around the potential inability of the Stage-Gate system to adapt to more agile environments like startups due to the slow process with a revision of his initial idea. However, this will not be looked at in detail for this thesis.

The LSM does not provide these sequential steps in the process of building new products. Rather, it leaves the decision whether to proceed until after an MVP has been built, tested and measured - an approach that is arguably more suited for early-stage startups. On the other hand, the Stage-Gate system is mostly implemented in corporations and in which the dominant type of innovation is incremental.

2.4.2 Decision Making at the Edge

Making innovation decisions around incremental changes means to improve on what is already in place and therefore presents no major obstacle in the process for established companies. The picture looks different when radical changes are introduced. Making decisions at the edge of the known innovation 'picture' resembles placing bets for incumbent companies due to the lack of available information to base decisions upon (Tidd & Bessant, 2009). This presents an opportunity for startups in that it levels the playing field between them and the established players. As Christensen (1997) described in *The Innovator's Dilemma*, the accumulated knowledge and resources might not help the incumbent, but actually be counterproductive when adapting to new opportunities. Henderson and Clark (1990) share this opinion, as they see the necessary reframing and knowledge acquisition for radical innovations as a problem for established companies. Startups, by nature, do not have this baggage of past experiences or success that narrows them in their decision making. Software as a service startups for example are built on a business model predicated by the enabling factor of the internet. By not having physical distribution networks and sales contracts in place, in contrast to many incumbent companies, these companies can leverage the scale effects of the internet fully, thereby achieving low distribution and marginal costs for every new user added (Skok, 2015).

Past success, and the business model involved, can make it difficult for incumbents to change the very nature of their business with radical innovation. A well discussed example of this is Kodak's reaction to the emergence of digital photography. Due to their established business model, around high-priced and performance-focused photography products, the organization was not able to see the radical change in the market that was about to happen due to inexpensive digital photography (Christensen et al., 2004). Bhide (2000) supports this view, arguing that it is often self-imposed barriers in organizations that cause the inability to reframe. Core competencies become core rigidities (Leonard-Barton, 1995). Tidd and Bessant (2009) compare this to what psychologists call 'cognitive dissonance' in individuals. They conclude that the problem for incumbent companies is not the lack of effective allocation of their resources towards innovation decisions, but rather that it is too effective towards incremental innovations.

The need to think 'outside of the box' gives startups - especially SaaS companies - an opportunity to bet on emerging signals in the market which are currently in a blind spot for incumbents.

2.4.3 Building the Innovation Portfolio

Problems in product innovation can often arise from the cross-functional nature of the development process (Tidd & Bessant, 2009). Questions such as: 'in which market will the product be introduced?' and 'what functionality will it (service/product) have?' may arise when a shared vision is not present across the teams. The key for avoiding these problems is to involve all groups as early as possible in the concept definition/product specification stage (Tidd & Bessant, 2009). To properly deal with these three levels of innovation types, portfolio management - which is the term broadly defining this - needs commitment from the top management.

For an organization to stay relevant in the long term, they must build up a portfolio of different types of innovations (Leifer et al., 2001; Nagji & Tuff, 2015). As in the case of 3M, "*30% of sales comes from products introduced in the past three years*" (Tidd & Bessant, 2009, p. 319). An example given by Nagji and Tuff (2015) is Google, which invests 10% of their innovation activity on transformational innovations for markets that does not yet exists; 20% on "new to the business" opportunities (adjacent innovations); and 70% on incremental activities. However, this is no golden ratio, and each organization needs to find their own balance between risk and reward; novelty and experience; and many other uncertain elements (Tidd & Bessant, 2009). Furthermore, Nagji and Tuff (2015) argue that the 10/20/70 (transformational/adjacent/core) split is a good starting point for most companies, but depending on the stage and type of company, another split may be more beneficial.

Nagji and Tuff (2015) define the core or incremental innovations as optimizing existing products for existing customers and "*incremental inroads to new markets*". This could be anything from added service convenience to new packaging for consumer goods.

Adjacent innovation is, as discussed previously, leveraging something that a company does well into a new space. As an example, Nagji and Tuff (2015) mentions Procter & Gamble's (P&G) Swiffer - a cleaning mop with novel technologies. By having insights to the customers' preferences for long-handled mops, P&G used modern technologies that they already possessed internally to reach a new customer set and generate new revenue streams. To operate here, organizations are required to have fresh insights into customer needs, market trends, market structure, competitive dynamics, technology trends and other variables (Nagji & Tuff, 2015).

Lastly, transformational - also called disruptive, breakthrough or game changing - innovations are meant to create new offerings for whole new markets and customer needs (Nagji & Tuff, 2015). If these innovations succeed, they create headlines (e.g., iTunes). Exploiting such innovations requires that the organization use unfamiliar assets such as gaining deeper understanding of customers for yet not mature markets, with products that do not have direct antecedents.

2.4.4 Mapping the Innovation Selection Space

Within the selection step of the Simplified Innovation Process, Tidd and Bessant (2009) present a two-by-two matrix (see figure 2.7) to map out the possible spaces in which a company can select ideas to pursue next.

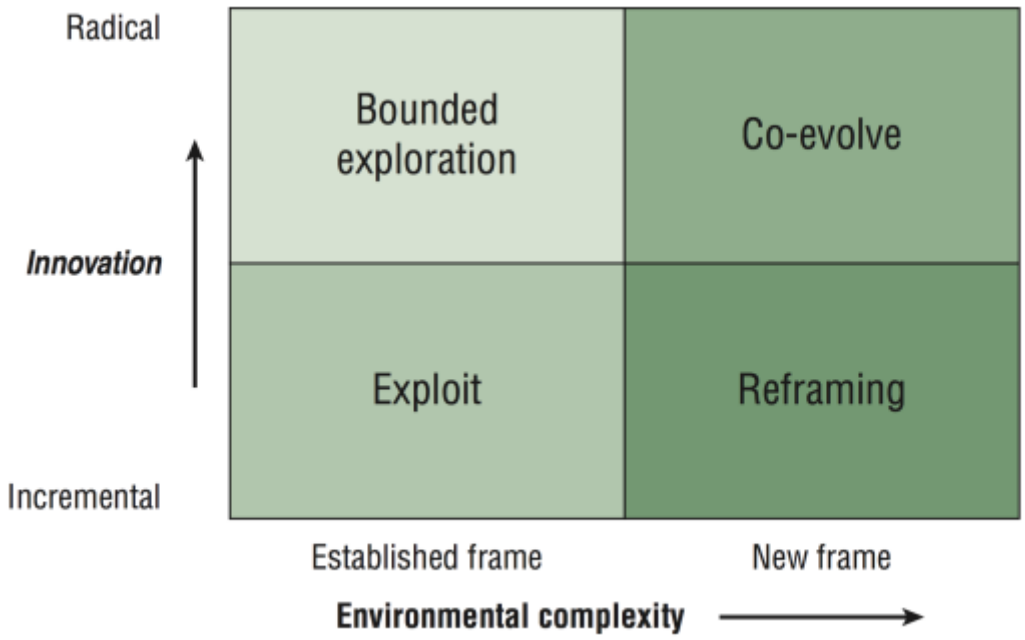

Figure 2.7 - The innovation selection space (Tidd & Bessant, 2009)

The vertical axis refers to dimension of the innovation. Radical innovation involves 'doing something differently' and is based on different sets of engineering and scientific principles (Henderson & Clark, 1990). Incremental innovation represents relatively small changes to existing offerings and products. It exploits existing designs and often strengthens the position of established companies (Henderson & Clark, 1990). However, companies can find radical innovation within their existing organizational boundaries and knowledge (Tidd & Bessant, 2009). The horizontal axis refers to the environmental complexity. Tidd and Bessant (2009) define this with the number of stakeholders and potential interaction points in the environment of the organization and innovation. A higher degree of complexity is a profound change in the way an organization gathers and interprets information (Tidd & Bessant, 2009). This provides a substantial challenge, as Hodgkinson and Sparrow (2002) point out, because of the reinforcing nature of an organizational structure. Christensen (1997) says that the difficulty is to notice and accept the relevance of new signals about emerging markets because the internal systems of a company are biased towards reinforcing the established business model.

Each of the four zones in figure 2.7 has different implications on the innovation management process. Tidd and Bessant (2009) argue that whilst the approaches in the zones on the left side are well established, there is still a gap in knowledge on how to approach the ones on the right side. The purpose of this review is to identify how the selection process is described by Tidd and Bessant (2009) for each space and which approaches to innovation management are suggested. This is of interest because it will allow to differentiate in which space the LSM and included tools are suitable for startups to use. Furthermore, it provides insight into in which spaces startups are in a potentially better position than incumbent companies in terms of selecting ideas. Giving also more insight into how the LSM can be better adapted to fit the nature of startups.

Exploit

'Exploit' represents a stable and shared frame in which the development of incremental innovation takes place. The process of selecting innovations to pursue in this space corresponds to using established practices for product and service development, such as Stage-Gate reviews (Tidd & Bessant, 2009). This highlights that selecting new ideas to pursue in this space works heavily in favor of incumbent companies. The reason presented by Griffin (1996) have been discussed in 3.5.1. The available product management tools assume, as established by Blank (2014), that the product has gained traction in the market and what the customers value is known. These are often unknowns for an early-stage and arguably later-stage startups. Furthermore, the enabling factors, as presented by Tidd and Bessant (2009), such as formal structures and formalized roles across the whole organization are arguably difficult to achieve for an early and late-stage startup.

Tidd and Bessant (2009) present a selection space in which startups, especially early-stage ones, are highly disadvantaged. Exploit means to select new ideas on the basis of what is already known and built in the past. Since the LSM focuses on testing and validating new hypotheses it does arguably present a suboptimal framework for this selection space. This becomes especially problematic if incremental innovations are the major part of the innovation portfolio at ESS and LSS.

Bounded Exploration

‘Bounded exploration’ means pushing the frontiers to something new while operating in the same frame of ‘business model as usual’. Instead of doing tactical investments, operating here requires bigger bets and higher degree of strategic commitment. Since innovations here carry a higher risk and uncertainty - and are harder to measure than fact-based business cases (exploitation) - persuading the decision makers to follow through with the idea will require strong endorsement from senior players or passion for the project (Leifer et al., 2001). The radical nature of innovations in this space makes standardized project management tools decreasingly ineffective. Decisions are based on little available

data and reassemble ‘acts of faith’ with no clear business case present (Tidd & Bessant, 2009).

The enabling structures for selecting in this field are similar to ‘Exploit’, but catered towards higher-risk projects and early ventures (Tidd & Bessant, 2009). Frameworks like the FEI are viable in this space, because even though the selection process is catered towards radical ideas, it is fueled by organizational attributes like strategy, vision and support from the management level (Koen et al., 2001). The LSM appears to be better suited for this selection space, but still held back by the lack of a dedicated selection process. It is questionable how many ‘acts of faith’ without a clear business case a company, especially a startup, can take.

Reframing

'Reframing' represents the focus on incremental updates to existing innovations but within an alternative framing (Tidd & Bessant, 2009). Often this takes place by incorporating elements in the market environment which are overlooked by established business models (Tidd & Bessant, 2009). Tidd and Bessant (2009) present the low-cost airline industry as an example for 'reframing': The innovation at hand still was centered around airports and planes, but included a reframing of the business model by identifying new customers and other elements in the environment.

The process of selecting innovations in this space is essentially entrepreneurial since it involves new combinations of elements in the environment of the company (Tidd & Bessant, 2009). The process is risky and prone to failure, but can lead to new business models often overlooked by the incumbents in the industry (Tidd & Bessant, 2009). The reasons for this were discussed in ‘Decision Making at the Edge’. ‘Reframing’ does not include radical innovations, but the required change of mindset might provide great challenges to an organization. Hodgkinson and Sparrow (2002) discuss the important role individuals play in this process. The inertia of an organization can quickly reinforce the existing line of thinking throughout the company.

The established structures, especially in incumbent companies, are mostly not viable for selection processes in this space since they are built around the existing business model. Rapid prototyping tools like the LSM potentially become viable in this space. Furthermore, the focus on essentially existing innovations in the light of new business models and markets does not erase the need for a dedicated selection step, but arguably reduces it.

Co-Evolve

'Co-evolve' represents the zone where innovation emerges as a product of radical new trajectories which are explored in interaction with many elements in the environment (Tidd & Bessant, 2009). A back and forth between stakeholders starts to define new paths which

lead to a new and “dominant design” that sets the standard (Utterback 1994). Developing selection strategies around this zone is difficult due to the high degree of uncertainty. Tidd and Bessant (2009) argue that the best way for an organization to deal with this space is by placing itself within the environment and listen to weak signals - snippets of information that can help companies figure out what customers want (Harrysson et al., 2014) - and react fast on them. "‘*Strategy’ here can be distilled down to three elements – be in there, be in there early and be in there actively*" (Tidd & Bessant, 2009, p. 273).

Boulton and Allen (2004) break the necessary strategy down: companies should make sure that they are in the co-evolving space at all, try to get in as early as possible and become a valuable partner in it. Perez (2002) describes innovations in this field as ‘paradigm shifts’ such as the Industrial Revolution, which illustrates the challenges of selection for both incumbents and startups. The enabling structures to effectively select innovations to pursue in this space are described by Tidd and Bessant (2009) as satellite ventures and outside agents. Arguably a very early-stage startup represents such a structure as well. The LSM appears to be a viable option for testing ideas in this space, because no concrete information about the innovation itself or its impact could possibly be known beforehand, due to the radical uniqueness of all involved elements. Hence the need for a dedicated selection step fades into the background.

3 Methodology

This chapter presents the choices made regarding the research methodology informed by the identified gap in the literature review. Identifying a suitable paradigm and data collection methods to gain understanding of the problems presented, as well as presenting how it was analyzed and which ethical considerations were taken into account.

3.1 Research Paradigm

Investigating how organizations, and the people that shape them, use frameworks to manage their innovation processes is highly subjective. Following the well established critique of the positivist paradigm (Collis & Hussey, 2014), this study recognizes that subjects are impossible to separate from their social reality. Human interaction is the fundamental layer of any organization, and studying such with a highly structured research design presents serious drawbacks. It puts constraints on the possible depth of findings and thinking, neglecting the effect of the researchers on the study itself (Collis & Hussey, 2014).

Following an interpretivist paradigm, this study seeks to describe and understand the challenges of implementing innovation frameworks in day-to-day routines. A literature review and interviews with startup employees in different stages are the main methods of research. This is in contrast to methods used within a positivist approach, which aim to base conclusions on the frequency of a phenomena (Collis & Hussey, 2014), an approach that is not suitable for studies with relatively small samples sizes (Collis & Hussey, 2014). The research design was built around the expectation that different stakeholders in the innovation process see the main challenges in varying stages of said process. There is not a single "reality" this research is based upon. Furthermore, the findings have shown to be heavily biased and shaped by the values the studied subjects, people or organizations share. A positivist approach would not have done this research environment justice.

3.2 Data Collection

This study uses two methods to collect data: conducting a literature review and interviews. The population, defined by Collis and Hussey (2014, p. 131) as the "... *collection of items under consideration for statistical purposes.*", of potential interview partners essential includes the entirety of ESS and LSS with a SaaS business model and in the B2B market. The final sample of companies was chosen by Natural sampling (Collis & Hussey, 2014), a method which takes the practical issues of finding participants and suitable dates to conduct interviews within the given limitations into account.

The interviews were conducted with a total of four companies: three that have gone through the ESS phase and are now well established late-stage startups, and one startup that is currently in the early stages. At the ESS, *Detectify*, three interviews with various stakeholders were conducted. At the later stage startups, *Pipedrive*, *Trustly* and *Soundtrack*

Your Brand, a single individual was interviewed at each company (making a total of six interviews overall, see table 3.1 for details). All interviewed employees work in one of the following roles: product development; product owner; Chief Information Officer (CIO); Chief Executive Officer (CEO); or Chief Marketing Officer (CMO).

Company	Founded	Title of interviewee(s)	Headquarter	Major offerings	Number of Employees
Detectify	2013	CIO, CMO, CEO	Stockholm, Sweden	Website security scanner	25
Soundtrack Your Brand	2013	VP of Product	Stockholm, Sweden	Music streaming for businesses	70+
Trustly	2008	Product Owner	Stockholm, Sweden	Online payment services	160+
Pipedrive	2010	Head of Product	Tallinn, Estonia	Sales management tool	260+

Table 3.1 - Overview of interviewed companies

Qualitative interviews are categorized in many ways, with the distinction between unstructured, semi-structured, and structured as the most common ones (Dicicco-Bloom & Crabtree, 2006). For the purpose of this research, the interviews were semi-structured, in face-to-face and video call settings. This type of interview presents a mix of structured and unstructured approaches. The questions are set in place before the interview takes place, but are designed in an open-ended way, which gives the interviewee the chance elaborate on certain topics and explain their reasoning further (Alsaawi, 2014). Furthermore, it was possible for the interviewee to ask follow-up questions and for more clarity throughout the entire interview.

Semi-structured interviews provide the most common, and often only, data source for qualitative research projects (Dicicco-Bloom & Crabtree, 2006). This approach makes it possible to keep the interviews narrow in scope but at the same time leave room for in-depth exploration of topics. By conducting these interviews with individuals and not groups of participants, it allows the interviewer to gain deep insight into social constructs and personal opinions (Rubin & Rubin, 2005). This is in line with the goal of the interview design: to understand the processes around innovation management at the chosen companies from the participants' perspective. Furthermore, by following a semi-structured approach, a realistic assumption about the duration of the interviews was possible, while keeping the explorative aspects intact. The participants all have demanding roles at their

respective companies; giving a realistic timeframe for an interview proved to be a key success factor in setting those up.

It is important to address potential weaknesses of interviews as a research method in general. Denscombe (2010) presents research which demonstrates that participants of interviews act differently depending on the interviewer. This so called "interviewer effect" is mainly caused by the sex, age and ethnic origins of the interviewer and causes differences in the amount and kind of information the participant is willing to share (Denscombe, 2010). Due to the limitations of this study in terms of resources and available interviewers, there was no focus on the possibility of this effect interfering with findings. A more pressing issue is what Gomm (2004) describes as 'demand characteristics', which is the tendency of participants to give the answer that seem to be appropriate in the context of the interview. Due to topic of the interviews, attention was paid to this potential weakness in the interview design.

The interview design was focused on quality and depth of data. By opening every interview with a set of questions about the company and the participant's role in it, we gathered basic data points and double-checked if our assumptions were correct. Furthermore, we asked for an overview of how the company's teams and their work are organized (see questions 1.1, 1.2 and 1.3). The second part of the interview focused on gathering deep insights into how the product development process at the respective company is structured. All questions in section two are open questions that aim to explore and gather broad information. The potential drawback of too much information provided by very talkative participants does not outweigh the benefit of gathering stories about the process in the researcher's point of view. The goal of the third section was to see if the participants are aware of innovation management methods, in particular the LSM. After we established the baseline of working with innovation at this company in section two in depth, question 3.1 and 3.2 can elaborate on potential problems with implementing something new. See table 3.2 below.

Index	**Question**
1.1	What's your role in [Company X]?
1.2	How many people are working for [Company X] at the moment?
1.3	How are the multiple teams in your organization working together?

2.1	Tell us about the process of developing new products and/or features at [Company X].
2.2	How do you identify new ideas?
2.3	Please explain the processes of deciding which ideas are worth pursuing.
2.4	How do you implement the ideas into your products/services?
2.5	How do you measure success of recently developed products/services?
2.6	Can you give an example of a suboptimal product development process at [Company X]?
2.7	Can you give an example of a great product development process at your [Company X]?
3.1	Do you see problems with implementing Lean Startup Methodology into your processes?
3.2	Are you aware of any other innovation management frameworks for startups?

Table 3.2 - Interview questions

Collis and Hussey (2014) define reliability as the accuracy of the gathered data and the absence of variations in the results, if the research were repeated. Due to the explorative nature of interpretivist studies, the reliability of the gathered data is typically low (Collis & Hussey, 2014). This is due to the underlying assumption that the research itself may be influencing the data. Therefore, replication of an interview with the purpose of getting the exact same outcome seems difficult. This becomes evident when taking biases like the already mentioned 'demand characteristics' into account. Another reason for low reliability of interpretivist research is the typically small sample size (Collis & Hussey, 2014).

The other aspect of credibility of research is validity. It refers to the effectiveness of a research method and if the results reflect the studied subject or phenomena properly (Collis & Hussey, 2014). It is often presented in terms of 'truth', which is a rather problematic notion given the interactive and social nature of qualitative research (Kuzmanić, 2009). Following Payne (1999), the interview is situated in a specific, mostly face-to-face, context. If we assume the interview is a collaboration between the interviewer and the

interviewee, with uncertainty about the what the objective 'truth' is, how can validity be ensured? To do so, the question of validity was addressed throughout the entire interview process. By gaining an understanding about the theory behind qualitative, semi-structured interviews and by testing the interview questions on non-study related participants, the validity of data production was ensured.

Given the importance of nonverbal communication in interviews and how easily gestures and body language of the interviewee are lost in the process, each interview was conducted by two researchers. By leaving the interview mostly to one person, it allowed the other to take notes on data points which otherwise would been lost when only relying on the audio recording. The process of interpreting the gathered interviews is arguably the most important to ensure validity (Collis & Hussey, 2014). Most studies suggest that the goal should be to keep the influence of the interviewer on the actual data as minimal as possible (Kuzmanić, 2009). In this study, a strategy referred to as 'reflexivity' was used to achieve this, as described by Seale (1999). By making it obvious and explicit to the reader what the researchers' points of view on the topic at hand are, the reader is enabled to judge to which extent the presented findings are influenced (Seale, 1999).

3.3 Data Analysis

To analyze the data collected throughout the interviews, the researchers initially started with data reduction, as suggested by Collis and Hussey (2014). The process of data reduction is "*selecting, focusing, simplifying, abstracting, and transforming the data that appear in written-up field notes or transcriptions*" (Miles & Huberman, 1994, p. 10). This process was done by first reducing the notes taken during the interviews and discarding notes that did not directly relate to the asked question for each interview. Secondly, these notes were added side-by-side in a spreadsheet to find similarities and differences in the answers. In the following step, the researchers summarized the notes into two set of answers: one for the interviews with the different stakeholders in the ESS, and one for the late-stage startup. This process allowed the researchers to analyze the main differences between the companies in the different stages.

3.4 Ethics and Sustainability

Throughout this research, the ethical guidelines were in line with Collis and Hussey (2013) suggestions. The entire process, from primary and secondary data gathering to conclusion and recommendations, was conducted by the two researchers.

To conduct the interviews, the researcher asked for permission to record the answers. Moreover, as recommended by Collis and Hussey (2013), the participants were offered to keep their names confidential. However, all of them allowed the use of their title(s) and company name(s) in this thesis. This allowed the interviewees greater freedom in their responses. As some of the participants requested anonymity, the researchers decided to

keep all names out of this thesis and to not transcribe the interviews. All direct quotes used in this report have been included with the consent of the interviewee.

To limit the amount of the carbon footprint for this research, the researchers made an active decision to keep all copies of their work digital. Furthermore, by promoting and improving digital practices in product development, unnecessary waste will be reduced.

Worth disclosing is that both researchers were employed by the interviewed ESS (Detectify) at the point of conducting this research. This allowed the researchers to have extensive access to the entire senior management team (CIO, CMO and CEO). Moreover, any unclarities from the conducted interviews could easily be resolved due to daily access to the interviewees, which might have been more problematic for other researchers. The close connection to the ESS might also have influenced the design and outcome of this research. However, the researchers operated independently through the entirety of the research, while the role of the ESS was only to provide answers to the interview questions.

4 Findings and Discussion

Findings and the discussion of those are presented successively for clarity. First, the findings from the interviews and literature review will be discussed in regard to the selection of ideas. Furthermore, relevant findings to selected steps from the LSM will also be presented and discussed.

4.1 Selecting Ideas

> "*[selecting ideas worth pursuing] this is the most difficult part of product management. There are so many ideas…*" -Head of Product, Pipedrive

Throughout the interviews, it became clear that an abundance of ideas for new products and services presents a major challenge for all companies. The sources of these ideas vary: some stem from a historical backlog from the founders and their vision of the product; others have their origin in customer requests and suggestions. Ideas from employees and investors as well as general market trends present other common sources of inspiration for the product development process. In general, the more radical changes stem from the overarching vision of the founders but can be driven by other sources, like customer input, as well. On the other hand, incremental change comes from a wide range of sources.

4.1.1 Need for Product Ownership

The product owner fills the role of involving all necessary stakeholders in the product development process. Here we saw a clear distinction between the ESS and the late-stage startups. In all the interviewed late-stage startups, there was at least one dedicated role for owning the product (see table 4.1 for more details). This function worked as a bridge between the product team and the marketing and sales team, to make sure that their vision was aligned. Additionally, these product owners had plenty of flexibility in the decision making process at the company.

Lack of formalized product ownership at Detectify (the ESS) has led to a more ad hoc approach of selecting which ideas to pursue. Detectify's CIO often filters ideas that come in from customers and the sales team into the tech team's planning. This has led to a situation in which the CIO has taken on the role of informal 'product owner' for most projects. Moreover, the CIO and CEO, who have the last say on the idea selection, meet biweekly to prioritize which ideas to pursue over the next "sprint". The lack of product ownership was identified as a key pain point for troublesome product development processes.

For the late-stage startups, all of them had clear product owners. Interestingly, it seemed like the number of product owners' correlates to the size of the company (see table 4.1 below)

Company	Number of employees	Number of product owners/managers
Pipedrive	260	10
Trustly	160	3
Soundtrack Your Brand	70	1

Table 4.1 - Employee count and product owner ratio

In these companies, the product owner has more flexibility when it comes to deciding which ideas to pursue, as long as they are in line with the organization's overall strategy. However, at Soundtrack Your Brand, a product board was in place for a more formalized decision making process of which ideas they should pursue. Radical changes often required agreement from the management team, while smaller - or incremental - tweaks were up to the product owners to decide. Tidd and Bessant (2009) argue, that incremental changes should follow a traditional Stage-Gate process with clear go/no-go gates for selecting ideas. Interestingly, none of the interviewed companies did follow such approach. It could be reasoned that these Stage-Gate approaches are not suited for the startup environment since they generally favor a more agile approach. Additionally, this process is more resource dependent than ad hoc decision making, which in turn is something scarce at startups in general.

On Pipedrive, the management team set: "*The main objectives for the year*". An example of what these objectives could be is: "*[to acquire] many newer paying customers instead of adding more value into the higher tiers.*". When these objectives have been set, it is communicated to the entirety of the organization. Based on the objective, the product managers set up a roadmap that "*best reflects these objectives*" and thereafter create concrete projects around it. This has led to having teams that are more "*engaged if they are a part of the decision making process"* and also has increased the "*employee moral"*.

Discussion

The findings have shown a clear need for and benefit of dedicated product owners. Carving out clear responsibilities for said product owners is key for this role to be successful. We argue that this is more feasible the bigger a company's headcount and customer base has grown. The reason for this is the increase in scope off all functions within the organization that justifies dedicated roles to facilitate the flow of information between them. Tidd and Bessant (2009) pointed out the need for formalized roles in an effective selection process, especially when dealing with incremental innovations, as well. This leaves the question of how early-stage ventures - like Detectify - should implement this role. We argue that an ad

hoc ‘product owner’ for basically every new project presents problems, even though this approach seems justified at smaller companies. The problem stems from the fact that the ad hoc product owner is part of another team inside the organization. The role of the function, however, is to ensure a flow of information between all teams and, more importantly, balance the needs of involved stakeholders to drive product development forward. A potential conflict of interest emerges here by design.

All later stage startups give their product owners the freedom and responsibility to make choices for their respective products. We believe that this approach is sound and frees the management and founders from micro-managing the development process, something that is likely to happen at early-stage startups with founders who have a strong vision. The role of the management team should be to set goals for the product in an agreed upon timeframe, in line with the overall vision of the company. It is then the product owner’s responsibility to break this down into actionable tasks for the team. A quarterly review - as conducted at Pipedrive - of progress enables timely feedback and makes it possible to change direction early on. We agree with our interviewee at Pipedrive, who described this approach of management.

The responsibilities of a dedicated product owner should include the selection of the next idea to pursue, rather than only the execution of such. The LSM provides insufficient tools to cope with this task efficiently. Following our literature review, traditional methods to select ideas like the Stage-Gate process are insufficient for early and later-stage startups due to their complexity.

4.1.2 Cross-Functional Approach

A cross-functional approach to the selection process is important: this was the predominantly feedback all interviewees provided. Trustly in particular pointed out the importance of involving all concerned groups within the company as early as possible in the product development process. In the case of Trustly, a general theme for suboptimal projects has been when the development team is involved too late in the process. In these occurrences, the specifications had been set by the product owner and buy-in from customer(s) had been done, while the feasibility and scope were not discussed with the development team in detail, resulting in unclear deadlines and problematic scope.

Discussion

Following the reasoning by Tidd and Bessant (2009), we agree that a shared vision across all teams about the intended outcome of a project is vital for its success. However, the risk of implementing in-depth cross-functional work needs to be discussed. We argue that the drive for collaboration between all stakeholders in the company can result in a static process dependent on too many formalized meetings. Ultimately the upside of cross-

functional work -- a shared vision, early and clear input on the feasibility and identification with the product -- outweigh the potential drawbacks.

Furthermore, we see a dedicated product owner as the enabling factor for effective cross-functional work. This role takes on balancing the need for collaboration and fast iterations. We draw this conclusion from the lack of cross-functional processes at Detectify, the one company out of the four investigated without a dedicated product owner.

4.1.3 Building the Innovation Portfolio

None of the interviewed companies mentioned an overarching innovation portfolio strategy. Nagji and Tuff (2015) argue that proper management of the innovation portfolio is vital for a firm's long term success. For such a process to be set, commitment needs to come from the top management. Similarities between the early-stage startups and the later stage companies were found in decision making around radical changes. These usually require approval from the top management. Nagji and Tuff (2014) reinforces the importance of having involvement from the top management team.

Discussion

For a company to commit to an innovation portfolio strategically, the management team needs to be on board. Radical and transformational innovations entail a larger extent of risk by nature since the market is currently unknown. However, these high risk bets could also result in high rewards. Therefore, making the management team aware of that certain projects may be a great success while others will fail miserably will result in product owners willing to take risk. Moreover, to get a proper diversified portfolio, incentives for the product owners may have to be put in place to avoid incentivizing only safer incremental projects.

One concrete example of division of innovation efforts given by Nagji and Tuff (2015) for a mid-stage technology company is 45/40/15 (in percent) on incremental/adjacent/transformational innovations. Even though these are only guidelines, a formalized structure around the portfolio management may help the companies prioritize their efforts already in the selection process. The 45/40/15 split given by Nagji and Tuff (2015) is not a golden ratio, but rather a starting point for companies to experiment with and find the right balance that works for them.

A limitation with such a strategic commitment is that it in some senses reduces the flexibility of the product owner’s decision making. If they are required to spend X % of their efforts on a certain innovation type, this means that less time will (can) be spent on the other types. A concrete example of this would be a company that has found something that seems to be working. Instead of continuing down the same track and doubling down on incremental updates, the company is required - by design - to prioritize and pursue other

more radical efforts as well. We believe this was one of the key reasons why none of the interviewed companies have processes for managing their innovation: they have found something that is working and are currently exploiting this opportunity. However, we believe that the company should always look ahead and think about the bigger picture, and try to stay relevant in the long-term.

This focus on incremental innovations has implications for the implementation of the LSM in those companies. As Tidd and Bessant (2009) argue, established selection processes like 'Stage-Gate' are more suitable for an environment where information about the market is available and decisions can be based on past product launches. The lack of a dedicated selection process becomes an obvious obstacle for the implementation of the LSM in early and later stage startups. Our literature review identified other innovation spaces where the internal structure of startups is more suitable and the LSM potentially presents a feasible way of working with new innovations. However, startups rather quickly evolve into a state where they gravitate away from these spaces.

4.2 Building Products

The process of building new products at Detectify is characterized by a lack of formalized processes. To ensure the necessary flow of information between all involved teams or individuals, ad hoc meetings are common. The responsibility to drive product development forward as a whole is not clearly defined. However, the development of technical aspects is structured formally by using Agile methods, which often leads the CIO to take over the responsibility of driving the entire development process forward. This lack of clearly defined product owners results in misalignments between the involved teams, as the interviews at Detectify have shown.

Designated product owners are the driving force behind product development at the later stage SaaS startups. The responsibility to involve everybody necessary in the process, set clear restrictions and goals and ultimately ensure that what is being built will be successful in the market, lies with this role. However, the process of building the product is mostly informally organized at the companies interviewed. The exception is the process around building the technical components, which are structured in agile methods without exception. Communication is based on ad hoc meetings and only structured for major changes to the core product. At Trustly, the approach is entirely up to the product owner and dependent on how big the headcount in the respective team is. Two of the interviewed companies (Pipedrive and Trustly) work with MVPs to validate their ideas before committing too much of their resources. These MVPs could be anything from pitching the idea in a customer meeting to adding a feature with minimal requirements on their website to see "what sticks".

However, there was a clear distinction between two of the later stage startups and the early-stage startup around how formalized this strategy was. This approach impacts the design

of the product and possibility to cut down the scope of it without questioning the whole project. The ability to ship elements of a product before completing the entire process, are valued highly.

For the interviewed companies, the act of building new products and features seems to be less of a pain point compared to selecting which ideas to pursue and measuring their success. As the majority of interviewed companies have founders with a technical background, we believe that this may be an underlying driver of efficiency around building new products and features. However, while this results in a more efficient building process, downsides in the form of prestige around the work they do could result in limitations for conducting fast feedback loops and interaction with customers.

Discussion

MVPs were only used, explicitly, by two out of the four interviewed companies. We argue that this may be a result of founders who are reluctant to release something that is not of the highest quality and in line with their vision of the product. Interestingly, it seems like the utilization of MVPs corresponds to the size of the company. The two largest of the interviewed companies in terms of employee count said that they were using MVPs for their product development process. Moreover, these two companies were the only companies with multiple dedicated product owners/managers. It could be argued that the utilization of MVPs has been emerging as the product owners get a bigger role of deciding the procedure of how to build and validate products, as the founders get more detached from the day-to-day decisions.

4.3 Measuring Success

> "*One of the most important contributions I made was helping to structure the full set of numbers that are available in a complicated business into a few simple reports that people could read. [People could] know that if they focused on those they'd understand the business, understand how to drive the business and improve performance.*" - Steve Ballmer (2017), former Microsoft CEO

According to our findings, the measurement of how well a new product performs with customers and in the market is not a priority at Detectify. There are various reasons why this is. Lack of knowledge and resources on how to implement such measurements effectively and efficiently, as well as a too small customer base to achieve statistical relevance for a data-driven process are mentioned by the interviewees. Furthermore, the absence of clearly defined KPIs for a product in terms of user and financial performance amplifies the inability to measure. In addition, stability of the system and performance of the tool are KPIs set and measured internally by the development team. To gain qualitative feedback from customers, interviews and surveys are conducted on an ad hoc basis.

All later stage startups recognize the importance of data measurements of how their products perform. However, the scope of those measurements is small but increasing with the company size: from almost nonexistent at Soundtrack Your Brand, partly implemented at Pipedrive. The reasons for this are manifold. Lack of knowledge on how to do it effectively, as well as the absence of company wide agreed on KPIs for products, are the most common. The most important metric is the plain usage of the product for all three companies, as well as the churn rate in a given time frame. At Trustly the hesitation for using universal KPIs stems from the very different nature of products. Some releases represent enablers for future features which are important for the company, but are performing poorly judged on their own. To gain qualitative feedback from customers, interviews and surveys are conducted. The processes around this are vaguely formalized, for example at Soundtrack Your Brand a monthly report about the most common complaints and requests collected in customer support is communicated to the VP of Product. Even though all companies said they are determined to improve in the area of measurement, it became clear that this area represents a blind spot for them.

Discussion

As established in the literature review, Ries (2011) promotes an alternate way of measuring success of innovative products. Described as 'innovation accounting', it breaks with the traditions of accounting which are focused on KPIs like return ratios, margins and profits. He argues that these work for already established products but not for products that are new to the market. The findings from all companies validate this hypothesis. However, multiple authors (Maurya, 2010; Croll & Yoskovitz 2013) argue that companies should relentlessly measure a few metrics that matter the most for the business at the moment.

Identifying what Croll and Yoskovitz (2013) call the one metric that matters (OMTM) is crucial for early-stage startups to guarantee that efforts are spent on what is most crucial for the company in the stage they are in. The interviewed companies could not highlight a specific OMTM, however as Soundtrack Your Brand mentioned, the churn rate of users will be the most important metric for the foreseeable future.

Interestingly, none of the interviewed companies had a set process around measuring the success of recently released products and features. We argue that the underlying reason is lack of knowledge and resources to do so. Firstly, when a clear set of KPIs has not been set at the initial stages of the process (selection stage), it results in issues understanding whether the project has been a success. On the contrary, if the goal of the project had been known at its initial stages, measuring its success would have been straightforward. Secondly, resource constraints are a well known feature among startups. This in turn results in a phenomenon in which tasks that do not immediately translate into 'new releases' gets deprioritized - such as measuring the success of past products or features.

We argue that focusing extensively on measuring only one metric (OMTM) might be a stretch for the researched companies due to their sizes. As the startup scales, the focus will change to more metrics for the different functions. However, when it comes to SaaS companies, churn will always be one of the metrics with biggest significance: no matter how many new customers you acquire, if a high number of people are leaving your service (churning), profitability will go down. Considering this, using the churn rate as a metric on which future product decisions are based on should be a top concern for SaaS companies - no matter the department.

Having a clear stack of KPIs and innovation accounting, such as the 'pirate metrics', to measure throughout the organization could be beneficial in the sense of measuring the success of recent efforts. For example, by continuously measuring acquisition, activation, retention, revenue and referral with relevant metrics, the companies could validate whether they are on the right track (persevere) or should focus on something else (pivot). We argue that there is not an ideal set of metrics that would be relevant for every company, but rather that the 'pirate metrics' could be a good starting point for most SaaS companies.

For qualitative feedback, we noticed that ad hoc customer interviews were conducted by most of the interviewed companies. However, clear processes for when to gather this feedback were not in place. As these interviews can provide vital feedback that is hard to gather through quantitative methods, we believe that structured customer interviews after each new product or feature release could further strengthen the processes of measuring success. One good example of how this could be achieved comes from Pipedrive. Some of their new features are only released to a small number of customers that have promised to leave feedback about their experience in exchange for getting access to the new features first.

Customers that decide to churn could also provide valuable insights in how the service could improve. Therefore, we argue that routines for 'customer exit' interviews should be set in place. As these customers may be less inclined to provide feedback, incentives such as free usage of the service for a certain time period or vouchers on established e-commerce sites could be offered in exchange for feedback. Moreover, these exit interviews may lead to occasional 'win-backs', in which the customer is convinced to stay on longer for a trial period. If such an opportunity is given, the company should focus extensively on making the 'won-back' customer pleased with the service, and at the same time gather as much feedback as possible to fuel the next product development cycle.

5 Conclusion

The primary purpose of this research was to contribute to how the LSM could adapted for SaaS startups. Firstly, the identified areas where the LSM could be adapted will be presented. Secondly, the lessons ESS can learn from the LSS will be shown. Following, the limitations of this research and suggested future research will be covered.

5.1 Adapt the Lean Startup Methodology

How can the Lean Startup Methodology be adapted to better fit the nature of B2B SaaS startups?

Deciding which of the many (perhaps hundreds or even thousands of) available ideas is worth pursuing presents the main challenge in the product development process for all interviewed companies. This confirms our hypothesis that the LSM is in need of a more feasible selection approach for the companies in the scope of this research. The LSM suggests validating ideas by going through the entire feedback loop. The number of radical innovations any given company wants to implement is usually manageable but organizations can quickly drown in incremental ideas. Keeping the company afloat limits the amount of available product development resources to do feedback loops on ideas, as the LSM suggests.

As Ries correctly assumes, entrepreneurs have hypotheses that need to be tested and validated. However, we suggest that a primary screening of ideas and hypothesis may be required. Even though the feedback loop provides a fast process of validating assumptions, the sheer number of potential innovations companies could implement makes it partly unfeasible. By having set processes around idea selection, the LSM process could be improved greatly in that regard, by our estimation.

A common obstacle mentioned throughout all interviews was a lack of time and other resources. We agree that building MVPs of potential innovations is an effective way to test those out before committing fully, but argue further that this in itself consumes significant resources at early and later stage startups. The fact that only Pipedrive and Trustly work regularly with some sort of MVP underlines this, since they present the two companies with the most resources in this study. Both companies also see potential pivots, the possible last step of the LSM, as difficult to conduct. Rapid changes in the product, because an innovation did not live up to the expectations, are unlikely. We conclude from this that when ideas enter the feedback loop, the commitment to them is already significant. The invested time and resources to build the MVP, like communication between all stakeholders, makes it difficult to push through radical changes in day-to-day operations. Moreover, the process of deciding what is in fact the ‘minimal’ in the MVP may be troublesome, and may not be in line with was is defined as a MVP in the LSM. As the scope grows, so does the resource commitment and cost. This makes a strong case for a

better screening process at the beginning of the LSM. Furthermore, the process of building an MVP is more difficult for most companies than described by Ries (2011). Especially the later stage startups in this study have a highly incentivized to fully commit to their strategy that allowed the quick growth in the first place. How many MVPs for new ideas can be built, before other proven tracks fall behind in development?

As discussed by York and Danes (2014), entrepreneurial biases can have a strong effect on startups. While their idea may be confirmed by close friends or people within the same niche community, the opposite may be true for the broader audience.

Interviewing the late-stage startups showed the importance of product ownership. In our view, Ries does not emphasize this enough in the LSM. Leveraging cross-functional teams is briefly discussed by Ries, but as became evident throughout our research, this requires a bigger focus. If a formalized product owner is lacking, measuring - or 'innovation accounting' - becomes troublesome since clarity of whom to hold accountable is missing. This may not be an issue for a three-to-four employee startup, but as the organization grows and different departments emerge, we believe that it is essential to have dedicated product owners.

We conclude that the reason why none of the interviewed companies has implemented the LSM fully into their product development process is the lack of a dedicated selection process (or steps), before the feedback loop, to achieve a preliminary screening of ideas. This would make the framework more usable for said companies and the reality of their innovation management processes. The researchers argue, that this finding and its discussion represent a contribution to the theory of innovation management and its practical implementation.

5.2 Lessons from Late-Stage Startups

> *What can early-stage SaaS B2B startups learn from the innovation management processes of late-stage startups within same sector?*

As discussed throughout this report, product ownership is an important feature in the product development process at late-stage startups. Not only does this function work as a bridge between different departments, it also drives projects forward. When there are clear product owners, someone can be held accountable for a project's success or failure. This in turn forces organizations to measure what is important for the stage they are in. Moreover, having a product owner also enables organizations to have greater agility in decision making.

Product owners also answer to more than one department in the organization, which forces this function to be aligned with the overarching strategy of the organization, as well as with the people building the products. By communicating both business strategy to the technical

team and technical feasibility to the marketing and sales team, a greater coherence can be achieved throughout the organization. As seen in the case of Trustly, retrospective meetings - coordinated by the product owners - with different stakeholders allowed them to gain valuable insights in recent projects.

As Ries strongly promotes, measuring the success of recently released products or features is essential. While even the late-stage startups were struggling with measurements, it has become evident that the earlier a company starts with building up a KPI stack, the easier it will be. As the organization matures, more and more data will be available, and deciding what to measure becomes more troublesome.

Communicating yearly objectives clearly and letting the different product teams align with these objectives also seem to carry great benefits. As Pipedrive pointed out, not only does it increase employee moral by less micromanagement from the executive team, it also seems to increase the engagement from the organization overall. Rather than having the management team say exactly *how* to achieve something, they communicate *what* they want to achieve.

Even though following the LSM step-by-step seems to be lacking throughout all interviewed companies, bits of it can be seen to a larger extent in the larger stage startups than in the early-stage startup. Especially when it comes to building minimal viable products (MVPs), it seems to correlate to the size of the company. We argue that as the organization matures, the founders get more detached from day-to-day decision making, which in turn enables the product owners to decide how to validate ideas. Startups with technical founders and a strong product vision seem to be reluctant to release something that is not of the highest standard, thereby limiting the possibility of validating ideas through MVPs.

5.3 Limitations

One of the limitations with this research has been the scope of the interview questions. While the goal was to obtain an in-depth understanding of the innovation management processes of the interview companies, it became clear that more questions about specific parts of the process would have been beneficial. Due to the complexity of this field and its many moving parts, a narrower focus of the interview questions could have resulted in a deeper understanding of the pain points product owners experience. As an example, no direct question was directed at understanding whether the companies had processes around innovation portfolio management in place.

Due to the time constraints of this research, only four companies were interviewed. We argue that more interviews could have strengthened the findings - especially interviewing more than one early-stage startup company. Moreover, by interviewing more stakeholders within each company, a better understanding of the reality could have been gained. Another

limitation of this research due to time constraints was the lack of investigating the 'learn' step of the LSM feedback loop. How the companies work with knowledge management could provide valuable insights regarding the challenges with implementing the LSM. Furthermore, an extended literature review that included a wider range of innovation management frameworks would have been beneficial to pressure-test the argument that the innovation management needs of early-stage startups are not served sufficiently today.

It is also important to address potential weaknesses of interviews as a research method in general. The "interviewer effect" is mainly caused by the sex, age and ethnic origins of the interviewer and causes differences in the amount and kind of information the participant is willing to share. As the researchers were employed by the ESS at the time of this research, the interviews conducted with this company may have provided a more truthful picture to the reality than with the LSS. Moreover, because of the time constraints for this research, focus was not given to investigate the potential effect the "interviewer effect" had on the interviewees.

5.4 Future Research

For future research, we suggest conducting an in-depth analysis of companies' selection process in the innovation management process. An investigation of how companies prioritize their innovation efforts regarding incremental and radical ideas could result in interesting findings. Additionally, future research could look at concrete suggestions for startup companies - especially on how to select ideas and how to measure success. Lastly, the findings regarding product ownership could provide some guidelines for future research on the importance of product ownership within SaaS companies.

By changing the scope and looking at the other stages of the innovation management process than select (search, implement and capture), a more comprehensive view of the struggles these companies are facing could be achieved. Moreover, researching other industries than the B2B SaaS industry could lead to other interesting research, as an abundance of ideas in the backlog may not be as present in those.

The effect of marketing for new innovations has not been covered in this thesis as focus has been on product innovation. By looking at how marketers position their products or services - position innovation - a greater understanding of 'what sticks' may be gained.

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