Process or Vision: Comparing Eric Ries' 'Lean Startup Method' and Peter Thiel's 'Determined Optimism'

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Abstract

Title	Process or Vision: Comparing Eric Ries' 'Lean Startup Method' and Peter Thiel's 'Determined Optimism'
Keyword	entrepreneurship, lean startup method, determined optimism, decision-making processes
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Scholars state that entrepreneurial venturing increasingly follows quasi-scientific methodologies in its quest to explore new approaches to create, deliver, and capture value. The Lean Startup Method (LSM) has established itself as an example to combine entrepreneurial venturing with a transparent and efficacious methodology. However, a growing part of the entrepreneurial community emphasizes the limitations of LSM, especially in new markets or when exploiting radical innovation. Peter Thiel's "Determined Optimism" is seen as an alternative, which, in contrast to process-oriented LSM, propagates a vision-oriented approach for entrepreneurs. This research study is structured as an exploratory qualitative inquiry applying the Grounded Theory approach, according to Corbin and Straus (1994). Ten in-depth interviews were conducted with both entrepreneurs and investors to enunciate the interpretation of the first-order analysis and to compile the findings gathered into a second-order interpretation applying open-coding methodology. We have investigated to what extent the application of one of the mentioned approaches is used in market environments marked by direct customer feedback and high market uncertainty. Also, we analyzed to what extent entrepreneurs should compare their business models to the competition. We find that market environments characterized by high uncertainty tend to favor the application of "Determined Optimism", whereas direct customer feedback tends to favor the application of LSM approaches. In addition, we find that benchmarking is preferable when LSM is used. The results contribute to managerial decision-making related to entrepreneurship.

Sumário

Título	Processo ou Visão: Comparação do 'Método *Lean Startup*' de Eric Ries com o 'Otimismo Definido' de Peter Thiel
Palavra-Chave	empreendedorismo, método *lean startup*, otimismo definido, processos de tomada de decisão
Autor	Hans Hosenfeld

Os académicos afirmam que o empreendedorismo cada vez mais segue metodologias *quasi*-científicas para explorar novas abordagens para criar, oferecer e capturar valor. O Método *Lean Startup* (MLS) ficou estabelecido como um exemplo para combinar o empreendedorismo com uma metodologia clara. Porém, uma parte crescente da comunidade empreendedora salienta as limitações do MLS, especialmente em novos mercados, por explorarem inovação radical. O "Otimismo Definido" de Peter Thiel é visto como uma alternativa, que contrastando com o MLS com enfoque nos processos, propaga uma abordagem para os empreendedores com enfoque na visão. Este estudo de pesquisa é estruturado através de um inquérito quantitativo exploratório que aplica a Teoria Fundamentada de Corbin e Straus, (1994). Dez entrevistas em profundidade foram conduzidas com empreendedores e investidores de forma a enunciar uma interpretação de primeira ordem da análise e compilar os resultados reunidos numa interpretação de segunda ordem aplicando a metodologia de codificação aberta. Investigámos até que ponto a aplicação de uma das mencionadas abordagens é usada em ambientes de mercado com *feedback* direto do cliente e elevada incerteza de mercado. Adicionalmente, analisámos até que ponto os empreendedores devem comparar o seu modelo de negócio com o dos concorrentes. Descobrimos que ambientes de mercado caracterizados por uma elevada incerteza tendem a favorecer a aplicação do "Otimismo Definido", enquanto que o feedback direto do cliente tende a favorecer abordagens MLS. Adicionalmente, descobrimos que o *benchmarking* é preferível quando o MLS é usado. Os resultados proporcionam um importante contributo nas decisões de gestão relacionadas com o empreendedorismo.

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To my parents for providing me with the best childhood, a person can ask for.
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Glossary

B2B	–	Business-to-business
B2C	–	Business-to-consumer
BMC	–	Business Model Canvas
CEO	–	Chief Executive Officer
DO	–	Determined Optimism
ICT	–	Information and Communication Technology
KPI	–	Key Performance Indicators
LSM	–	Lean Startup Methods
MVP	–	Minimum Viable Product
VC	–	Venture Capital

1 Introduction

Over the last decades, entrepreneurship has become the main driver for innovation and economic growth (Acs et al., 2009; Breuer and Pinkwart, 2018). While in 2008, four of the five most valuable companies came from rather traditional industries, in 2018, relatively young companies from the ICT sector dominated that list (see Table 1).

#	Company	Founded	$ Bn	#	Company	Founded	$ Bn
1	PetroChina	1999	728	**1**	Apple	1976	890
2	Exxon Mobil	1870	492	**2**	Alphabet[1]	1998	768
3	General Electric	1892	358	**3**	Microsoft	1975	680
4	China Mobile	1997	344	**4**	Amazon	1994	592
5	ICBC China	1984	336	**5**	Facebook	2004	545

Table 1 Largest global companies in 2008 (left) and 2018 (right) by market capitalization (Bloomberg)

Hence, the field of entrepreneurship has become a prominently recognized research topic within economics (Kerr et al., 2014). In short, entrepreneurial endeavors create, deliver, and capture value through a novel combination of tangible or intangible resources and activities (Ghezzi, 2019). As the importance of academic studies of entrepreneurship increases, so does the study of scientific approaches and methods. Concurrently, scholars state that entrepreneurial venturing increasingly follows quasi-scientific methodologies to explore new ways to create, deliver, and capture value (Camuffo et al., 2019; Gans et al., 2018; Ries, 2011). Among others, the Lean Startup Method (LSM) and its related tool, the Business Model Canvas (BMC), has established itself as a widely-spread and prominent example to combine entrepreneurial venturing with a transparent methodology (Felin et al., 2019). The LSM seeks to define a scientific approach for entrepreneurs, applicable in the dynamic context of startup creation, encouraging founders to define key-value hypotheses and to undertake structured experiments, while incorporating customers' feedback to continually re-iterate around the startups' business model (S. Blank, 2013; Ries, 2011).

The LSM is a methodology for startups to limit their time and conserve resources through continuous customer testing at an early stage (Ries, 2011). In brief, this approach proposes that the key to success is a bias towards action with early testing for wrong assumptions (Mollick, 2019). According to Ries, diagnosing shortcomings allows entrepreneurs to assess how viable

[1] Considering the foundation date of Google. Alphabet Inc. as the holding was founded in 2015 to restructure Google by moving subsidiaries to Alphabet.

their idea is, to gain insights from early customer feedback, and, if necessary, to make appropriate pivots. Furthermore, Ries states that it is better to fail early and pivot a business model expeditiously to prevent future costs. Thus, early engagement with real customers is a vital pillar of the Lean Startup Method (LSM). The entrepreneur formulates and prioritizes hypotheses, which then are verified or falsified. A randomized controlled experiment showed that companies acting according to the LSM performed better through early pivoting, avoiding market misfits, and ultimately achieving higher revenues (Camuffo et al., 2019).

Although the LSM has become popular among entrepreneurs, critics have raised doubts about this approach (Felin et al., 2019; Frederiksen and Brem, 2017; Kerr et al., 2014; Mollick, 2019). Felin et al. (2019) critique the LSM's capacity to create radical innovation along with its disregard for the role of beliefs and commitment. Prominent members of the 'countermovement' to the LSM are Peter Thiel and Blake Masters, both having secure first-hand entrepreneurial experience. Thiel and Masters' book "*Zero to One: Notes on Startups, or How to Build the Future"* posits that being lean and continuously iterating around an entrepreneur's hypotheses hinders substantial value creation because there is no long-term plan and vision for the future (Thiel and Masters, 2014). Furthermore, they state that benchmarking to the competition limits the ability to create something genuinely new, but instead focusses on existing markets and predefined customer segments. Finally, they claim that the LSM's concept of *"if a product is good enough, it will sell itself"* is short-sighted and neglects market dynamics. Throughout this analysis, we will refer to Thiel and Masters' approach using the term 'Determined Optimism' (DO).

The tension between the LSM and DO revolves around which approach is more conducive to creating, delivering, and capturing value. More specifically, this thesis will examine what common success factors contribute to value creation, i.e., how does incremental or radical and disruptive innovation occur, and what is indispensable for value capturing?

Contrasting the two approaches and their distinct advantages and limitations, this thesis will empirically investigate the respective contributions of the LSM and DO to our understanding of startups using a set of first-hand entrepreneurial insights from a diversified set of interviews.

2 Literature Review

This chapter encompasses a literature review (see Section 2.1) of entrepreneurial decision-making theories with a particular emphasis on LSM and Thiel's DO. Subsequently, we derive our hypotheses to fit the scope of this thesis.

2.1 Discovery and creation theories of entrepreneurial opportunity and action

In managerial science, entrepreneurship is commonly defined as an act of discovering profitable opportunities as well as consequently creating, delivering, and capturing the value from those opportunities (Shane and Venkataraman, 2007). According to Hitt et al., (2001), and Ireland et al. (2003), the initial "opportunity-seeking" endeavors of the entrepreneur are eventually followed by the strategic "adventure-seeking" behavior in order to exploit such opportunity. While the literature demonstrates a consensus around the relevance of opportunities in entrepreneurship, there are different theories concerning the emergence of these opportunities. Alvarez and Barney (2007) elaborated the idea that there are two alternative theories on entrepreneurial action, indicating that such opportunities can be discovered (discovery theory) or created (creation theory).

While discovery theory states that entrepreneurial opportunities tend to be independent of the action of entrepreneurs, creation theory suggests that opportunities do not exist objectively "out there" in the world but rather are created by the actions of the entrepreneurs. Creation theory, unlike discovery theory, has not been formulated as a coherent theory in the literature. Certain aspects, however, have been covered by numerous researchers going back as far as Schumpeter in 1934 (Alvarez and Barney, 2007). Due to the claim that opportunities are ubiquitous, discovery theory further suggests that, in theory, everyone could pursue them. Evidently, not everyone is an entrepreneur; consequently, the theory implies that there are "significant differences" between entrepreneurs and non-entrepreneurs in their ability to discover or pursue such opportunities. In managerial research, such differences are often described as personality traits like risk appetite and risk perception and cognitive divergence (Alvarez and Barney, 2007). In creation theory, unlike others, entrepreneurs "act, and observe how consumers and markets respond to their actions" (Alvarez and Barney, 2007). It thus starts from the assumption that opportunities are not formed by exogenous shocks, but are social constructs endogenously created by the actions, reactions, and enactment of the entrepreneurs who explore ways to create value in uncertain circumstances (Alvarez and Barney, 2007, pp. 13–15). Subsequently, it entails an iterative process with incremental decision-making supported by heuristics.

2.2 The causation and effectuation approaches to entrepreneurship

Various managerial theories and decision-making contexts led to advancements of adjacent approaches and logics in entrepreneurial studies. In contrast to traditional causal logical accounts, Sarasvathy (2001) introduces the notion of "effectuation". In this, she contrasts traditional causation theory of entrepreneurial agency -- foreseeing the future as a causal continuation of the past and a future there to be reshaped – with a theory of reciprocal interdependence. In line with effectuation theory, entrepreneurs act using a set of means to plan for the unexpected, leveraging rather than avoiding contingencies. In essence, this translates entrepreneurial decision-making into a process of determining timing and optimizing opportunity.

According to Sarasvathy (2001), effectuation theory is based on five core principles:

1. Bird in hand principle; an entrepreneur using effectuation is starting with whatever resources she has at hand, and without a given goal.
2. Affordable loss principle; an entrepreneur using effectuation does not focus on potential profits, but on the potential losses - and how to minimize these.
3. Form partnerships; effectual entrepreneurs cooperate with parties they can trust, instead of spending time analyzing competitors. These parties can help limit potential losses, for example, by giving pre-commitments.
4. The Lemonade Principle; effectual entrepreneurs, look at how to avoid contingencies. Surprises are not necessarily seen as something terrible, but as opportunities to find new markets and opportunities.
5. The Pilot-in-the-plane; the four previous principles put together. The future cannot be predicted, but entrepreneurs can control some of the factors that determine how the future will turn out.

While neither, causation nor effectuation theory are applied to describe entrepreneurs' reasoning in decision-making, they lack a prescriptive nature. The theories further seem to be limited in regards to goal planning and resource allocation. Especially when compared to the LSM, effectuation theory provides few actionable conclusions for entrepreneurs (Nilsen and Ramm, 2015).

2.3 Entrepreneurial Bricolage

In line with effectuation theory, Baker and Nelson (2005) argue that entrepreneurs operate with limited human and financial resources, and have, therefore, to "make do" so the entrepreneurial endeavor entails combining or rearranging resources at hand and applying them to new opportunities. The core observation of Baker and Nelson's entrepreneurial bricolage theory points to firms with similar disposal resources ending up with very different outcomes, i.e., entrepreneurs "creating something out of nothing". So, entrepreneurial bricolage theory indicates that the ones with the highest scarcity in resources tend to use resources most efficiently. In entrepreneurial research, bricolage theory has been increasingly a matter of academic discussion over the last few years (Fisher, 2012; Perkmann and Spicer, 2014).

Although, we can ascribe some descriptive validity to the aforementioned theories concerning the actual behavior of entrepreneurs, operative guidance for entrepreneurs concerning exploitation of opportunities is still limited. Recent studies aim to combine principles of effectuation theory with actionable approaches of the Lean Startup methodology (Frederiksen and Brem, 2017; Yang et al., 2019). However, Ghezzi (2019) states that those contributions are still somewhat scattered and unconnected, all the while still displaying misconceptions of different stages of the LSM and its precursor, Customer Development (S. G. Blank, 2013; York and Danes, 2015).

2.4 The rise of the Lean Startup as an entrepreneurial development method

The notion of "Lean" originated with manufacturing, i.e., to describe Toyota's car production system focused on waste reduction and continuous improvement across the value chain (Womack et al., 2007). Scholars in the field of entrepreneurship view Steve Blank's concept of "customer development" as pioneering Lean Startup methodological approaches (Ghezzi, 2019; Ghezzi and Cavallo, 2018). In his seminal book "The Four Steps to the Epiphany: Successful Strategies for Products that Win", Blank promotes the importance of iterative customer testing and corresponding adjustments to the business model (S. Blank, 2013). Based on the premise that every entrepreneurial venture relies on a scalable and replicable business model, every startup's aim should be to formulate quasi-scientific hypotheses as core pillars of the business model. The verification or falsification of hypotheses, thus, contributes to making the business model scalable and replicable. Henceforth, the concept of "customer development" restates Karl Popper's concept of conjectures and refutations (Popper, 2014). Startups need to focus on developing customers rather than products. As illustrated in Figure

1, startups initiate the process of "customer development" by identifying early customer segments (Customer Discovery). Entrepreneurs should, therefore, focus on an adopting target group with an awareness of the problem and a general willingness-to-pay for a provided solution (S. Blank, 2013). The subsequent step of "customer validation" defines the iterative process of feedback loops with customers to incrementally improve the business idea. Such validation is based upon a set of initial hypotheses postulating the intended way to create, deliver, and capture the value of the business idea. These hypotheses are associated with distinct areas, which, in their interplay, constitute the business model. While, according to Ghezzi et al., (2015); Rappa, (2001); and Teece (2010), a business model can be described as an architectural structure of an idea, Osterwalder and Pigneur (2010) summarize a business model into three key pillars and a total of nine parameters known as the "Business Model Canvas". The "execute" phase then follows the "search" phase, according to Blank (2013). Once the customer segment has been discovered and validated, entrepreneurs can create their market demand by allocating resources into marketing activities. The creation of a customer base goes alongside the setup of functional teams and business units, which then constitutes the establishment of the company (S. Blank, 2013).

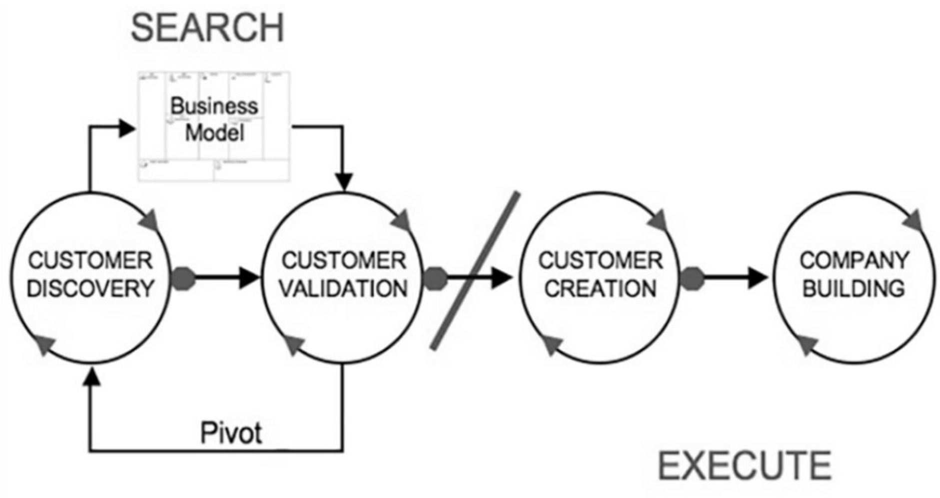

Figure 1 Customer Development (Blank and Dorf, 2012)

The quasi-scientific approach of the structured formulation of falsifiable hypotheses in "customer development" can also be found in the Lean Startup methods. The Lean Startup Method, first postulated by Eric Ries (2011), is geared towards the reduction of waste through early user-centric testing methods. In the book, Ries (2011) argues that the resource conservation is best achieved by minimizing uncertainty. Entrepreneurs ought to extract uncertainty factors from their business model and turn them into explicit hypotheses. By systematically testing these hypotheses, the elements of the business model can be iteratively verified or falsified. New assumptions replace falsified hypotheses, and measurable experiments are carried out to test them. Thus, the entrepreneur continuously iterates around user feedback. In theory, the business model thus increasingly approximates reality with each objectively verified or falsified hypothesis. Ries furthermore discerns the notion of hypotheses into (i) value hypotheses, referring to the solution’s actual value creation and its customer perception, and (ii) growth hypotheses, referring to the way customers discover and adopt the solution (Hartmann, 2014; Ries, 2011). A central cornerstone of the LSM is the notion of Minimal Viable Products (MVPs), i.e., a vehicle combining the minimum requirements to be considered viable in the market aimed at performing fast and quantitative testing. He additionally proposes the notion of pivoting, which represents a change in the development trajectory of the business idea, based on knowledge obtained through the learning process. It can be further stated that the MVP is really at the core of the experimentation phase: in essence, the MVP is designed to prove or disprove the formulated hypotheses at hand. Also, Ries (2011) puts particular emphasis on the “Build-Measure-Learn” feedback loop framework. In essence, this framework summarizes the idea of exposing the product as fast as possible to customer validation in the form of an MVP (the “Build” stage). In the next step, the entrepreneur is encouraged to rapidly gather first-hand data in low-cost experiments in pre-defined testing schemes (the “Measure” stage), and to receive necessary feedback to either validate or reject her hypotheses (the “Learn” stage). Figure 2 depicts the detailed process an entrepreneur faces when following the LSM.

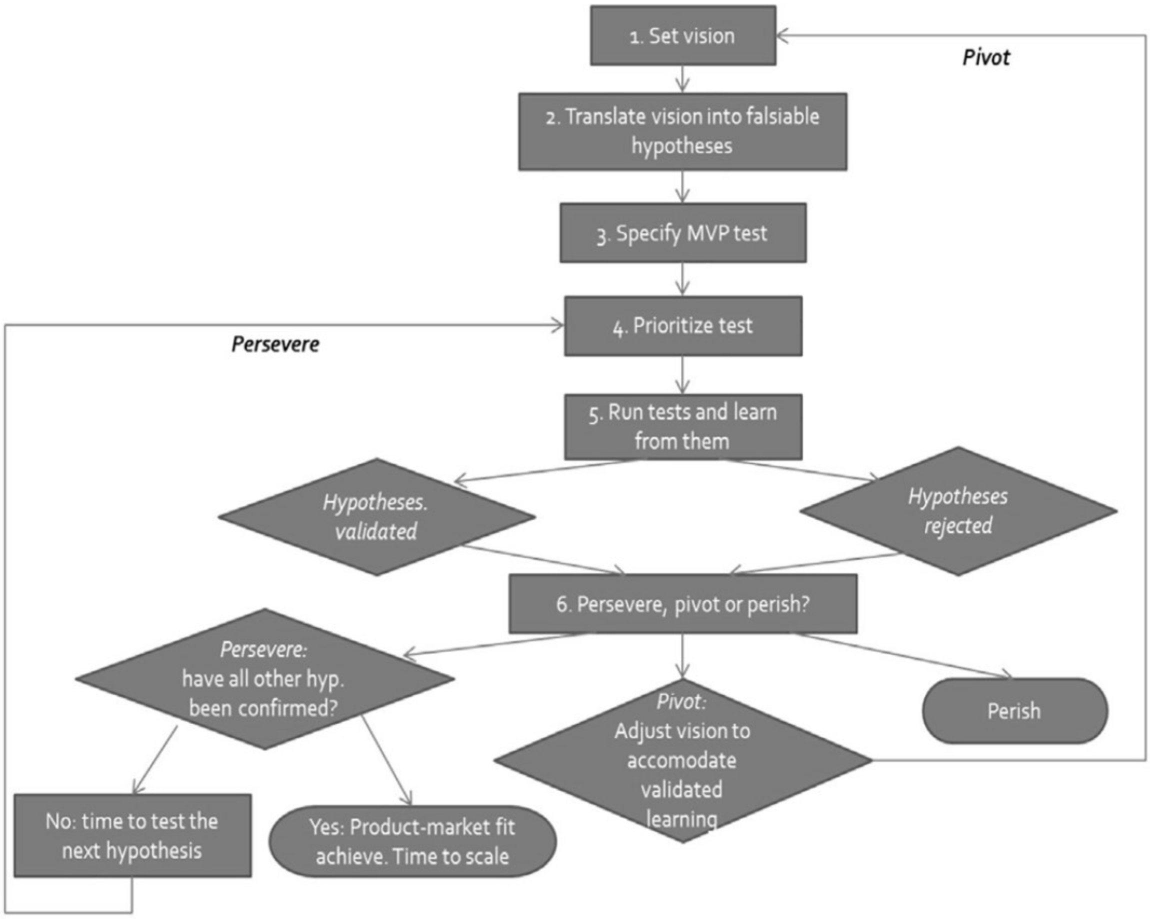

Figure 2 The Lean Startup Process (Eisenmann et al., 2017)

According to the academic literature, effectiveness of test cycles utilized by the LSM is an issue. For instance, Figure 2 illustrates a relationship between the frequency and speed of market feedback and business decisions (see "6. Persevere, pivot or perish"). This relationship suggests that business environments encouraging immediate market feedback are more likely to reap the benefits of LSM, i.e., reducing waste by pursuing fewer promising ideas. Ryynänen et al. (2017) and Xu et al. (2005) suggest that B2C markets are characterized by shorter sales cycles (and thus more immediate market feedback) compared to B2B. In direct consumer businesses, customer feedback can be detected much more quickly by defined KPIs and reacted to through product adjustments. This leads us to the first hypothesis:

Hypothesis 1) *LSM is preferred by entrepreneurs in environments with direct market feedback, especially in B2C contexts.*

Besides its wide adoption in entrepreneurial decision-making (Kerr et al., 2014), the LSM has gained attention from scholars seeking to assess its measurable effectiveness. Camuffo et al.

(2019) show in a randomized control trial that the quasi-scientific approach of framing problems as falsifiable hypotheses, and crafting rigorous experiments for corroborating such hypotheses, create above-average results and avoid both false positives (or pursuing bad business ideas longer than they should be) and false negatives (not pursuing business ideas that are promising). Along similar lines, Eesley and Wu (2015) quantitatively confront the planned-based approach (prescribing a transparent and pre-defined business idea) with an adaptive approach (granting space for business model iterations based on actual market feedback). They argue that the planning-based approach produces better outcomes in the short-term, yet, in the long term, the adaptive approach performs better.

Besides investigating the benefits possibly associated with the LSM, relevant literature points towards the costs associated with this approach. These include, firstly, the direct costs associated with experimentation, in particular creation of the MVP. Kerr, Nanda, and Rhodes-Kropd (2014) note that even though the costs of prototyping in software and information technology have dramatically decreased in recent years, especially for hardware costs for prototyping remain high. Furthermore, von Hippel and Katz (2002) argue that transferring user feedback collected into action without frictions occurring is not always easily achieved. For example, it is challenging to derive real user preferences directly from data obtained through experimental market research. This problem occurs not only in companies but equally for entrepreneurs with limited resources. A final cost possibly associated with the LSM relates to the quality of user feedback. The LSM is premised on the notion that interaction with users can generate findings on real user preferences. This implies that users are both aware of their real preferences and can articulate them clearly. Felin et al. (2019), however, raise doubts as to whether this is always true in reality. Among other points of criticism, Felin et al. (2019) point out that users tend to judge particularly innovative products rather negatively in the beginning, even if the products themselves are valuable. The reason given for this is that users are often not sufficiently familiar with radically innovative solutions to be able to assess value. Consequently, user feedback entails the risk that radical but potentially profitable innovations erroneously are not realized.

Much of the academic literature is concerned with the limitations of the LSM‘s ability to promote radical and novel solutions. In essence, it is argued that the LSM pushes the innovation process towards existing and, therefore, less innovative market environments. New and less mature markets with higher levels of uncertainty could thus be systematically overlooked by entrepreneurs. In line with Barney's (1986) theory according to which all strategically essential resources in a free market are priced according to their utility, the following hypothesis can thus be put forward:

Hypothesis 2) *Entrepreneurial innovation processes in market environments with high uncertainty factors, prefer the DO.*

2.5 An entrepreneurial countermovement: the vision-driven "Determined Optimism"

In recent years, scholars in entrepreneurial studies have interrogated the contribution of the LSM on entrepreneurial success. There has also been an ongoing effort to produce quantitative data on the effectiveness of the LSM. Nevertheless, purely quantitative experimental approaches have limitations since the dependent variables associated with the LSM are challenging to determine.

However, criticism is growing, with particular attention directed to the central limitations of the LSM. Felin et al. (2019) draw the analogy to the metaphorical equivalent of looking for keys under a streetlight (Kaplan, 1965); that is, using easily deployable prototypes to rapidly assess customers' (and investors') interests in a company's products. Felin et al. (2019), however, continue that the evidence collected in the market will lead entrepreneurs towards incremental adjustments rather than break-through innovations. Thus, customers' signals will lead the startup to iterate and eventually pivot towards an easily graspable variation of the product. This phenomenon can also be linked to the Technology Adoption Lifecycle, according to Moore (1999). Moore (1999) assumes that before a disruptive innovative product can reach the mainstream (which represents two-thirds of the market), it must first overcome the "chasm" of enthusiasts and early adopters. From Moore's findings, parallels can thus be seen with the criticism of, among others, Felin et al. (2019). Accordingly, the majority of consumers will reject novel products and prefer more well-established products in the market. Moore (1999) gives various reasons for this, such as existing trust in market leaders. Consequently, it can be concluded that the testing of a disruptive-innovative product on the broad market, according to Moore's model of adoption and distribution, cannot lead to broad acceptance.

In line with the aforementioned, Camuffo et al. (2019), as well as Felin and Zenger (2017), argue that the most valuable entrepreneurial ideas are the ones which are not easily identified with immediately-recognizable experiments. They agree with Van den Steen (2018) on the fact that they require a *"kind of contrarian belief, vision about and commitment toward a counterfactual world that may not easily be recognizable by other market actors"*. It can, therefore, be noted that according to recent academic literature, the most valuable ideas require a detailed elaboration of the underlying problem. Based on this, the entrepreneur shall formulate his vision and approach towards a solution. Felin et al. (2019) add that the process of experimentation to test these visions is very resource-intensive. This is also in line with Ries' primary hypothesis mentioned at the outset, whereby he favors early failure to avoid cost-intensive erroneous decisions in later phases. Gans et al. (2019) and Bennett and Chatterji (2019), argue that value creation depends on the significant commitment of entrepreneurs towards their defined vision rather than a set of low-cost experiments with limited information value. It can, henceforth, be stated that the decision as to frequency, depth, and cost of decisive experiments to be carried out considerably depends on the desired entrepreneurial goal.

Researchers confirm that low-cost experiments, according to the LSM, have advantages, especially in the context of incremental innovation. However, Felin et al. (2019) argue that this approach is not well suited to any ambitions to disrupt an industry fundamentally through radical innovation. Along with authors discussed above, Peter Thiel is one of the most prominent critics of the LSM. In his popular book "Zero to One: Notes on Start Ups, or How to Build the Future", published in 2014, Thiel offers alternative and, in part, contrary approaches to the LSM. These coincide with the findings of theories discussed which conclude that the LSM is of limited utility for generating radical innovation. He further expands this insight by adding the component of competition. The argument states that beginning with an existing customer base only leads to improving existing products. Accordingly, benchmarking would only promote incremental innovation and not radical innovation. Again, the reasoning can be transferred to Moore's Technology Adoption Lifecycle (Moore, 1999).

Besides, Thiel addresses an aspect that has not yet received much attention in connection with the LSM. Ries (2011) advocates the concept of "if the product is good enough, it will sell itself". Thiel contrasts this with the thesis that every product, no matter how good, requires adequate resources in sales. Thiel extracts the following four principles from his interpretation of entrepreneurs' usage of the LSM:

a. Make incremental advances
b. Stay lean and flexible
c. Improve on the competition
d. Focus on product not sales

Based on his disagreement on those thoughts, Thiel proposes the following alternatives to the LSM:

a. It is better to risk boldness than triviality
b. A bad plan is better than no plan
c. Competitive markets destroy profits
d. Sales matter just as much as the product

In line with this argument, Thiel argues that companies should create revolutionary and completely novel solutions instead of small incremental innovations. With this theory, he contradicts classical economics according to which perfect competition is a prerequisite for a functioning economy. In contrast, he argues that competition causes entrepreneurial profits to fall due to competition until they come to an equilibrium which ultimately is of marginal benefit for companies and consumers. He describes this relationship as destructive since falling profit margins, in the long run, will also affect the quality of the products and, at the same time, the long-term vision of the entrepreneurs. Based on this view, Thiel concludes that in a monopolistic position, a company can produce better products for its customers and therefore operate better than in competitive markets. In conclusion, Thiel concludes that every company should, therefore, create a monopoly in a market that is not yet competitive or does not yet exist for the benefit of customers and the company. This furthermore references Felin et al. (2019), who argued that more radical innovations should instead follow the DO approach. The following hypothesis can, therefore, be derived:

Hypothesis 3) *Iterating around and comparing oneself to the existing competition is more likely to be applied in less innovative business environments.*

With the above discussion and hypotheses presented, a further linkage can be articulated. According to Thiel, the LSM leads to stagnation in existing markets with continuous margin compression through competition. This argument suggests that the LSM is unsuitable for fully exploiting the potential of new markets or even for creating them from the ground up. However, in recent years, relevant economic literature has pointed precisely to the need to create new markets. This school of thought has been supported in particular by Kim and Mauborgne (2005) with their publication of "Blue Ocean Strategy: How to Create Uncontested Market Space and Make the Competition Irrelevant". Blue Ocean Strategy provides a theoretical framework and practical guide for companies to break out of cut-throat competition in existing industries and create new markets for profitable growth. While competitive strategy emphasizes the importance of choosing a distinctive position of either differentiation or cost leadership under structural constraints, Blue Ocean Strategy aims to break the trade-off between value and cost by cognitively reframing market elements across industry boundaries (Kim, 2005; Mi, 2015). While this question is beyond the scope of this study, it points to fruitful investigation through further research.

We examine the hypotheses presented above through empirical qualitative interviews with both entrepreneurs and investors.

3. Methodology

3.1 Research Approach

This research study was designed as an exploratory qualitative inquiry that empirically investigates the hypotheses. The early-stage business modeling process has been examined by conducting a case-by-case analysis based on qualitative semi-structured interviews in the first stage. The selection of the cases was chosen correspondingly to reflect different variants of critical dimensions. Following Clark, Gioia, Ketchen Jr., and Thomas (2010) and Ghezzi and Cavallo (2018), an interpretive approach was chosen to enunciate the first-order analysis. Compiling the findings of the first-order analysis for theory building, a second-order interpretation applying open-coding methodology based on the Grounded Theory (Corbin and Strauss, 2014) was formulated.

Even though, according to Eisenhardt (1989), exploratory analysis ideally starts without initial theory or hypotheses to prevent biases, theoretical claims were necessary to guide appropriate data gathering. Nevertheless, a neutral perspective was adopted throughout all data gathering so interviewees were never directly exposed to the research theories, i.e., LSM and DO.

The data gathering was designed as a set of semi-structured interviews, starting with a pre-defined protocol of open questions (see Annex A) as a guideline. The questions were exploratory and open-ended to allow room for issues to emerge from the discussions with interviewees (Walsham, 1995; Yin, 2014). The semi-structured interviews represented the primary source of data collection.

Grounded theory to systematically analyze qualitative information sources is a widely adopted approaches to extract, refine, and compare theories in sociology, managerial studies, and many more (Corbin and Strauss, 2014). The basis for Grounded Theory has been developed by various practitioners i.e., *The Discovery of Grounded Theory* (Glaser and Strauss, 1980;

Hunger and Müller, 2016), *Theoretical Sensitivity* (Glaser, 1978), *Qualitative Analysis for Social Scientists* (Strauss, 1987), *Basics of Qualitative Research* (Corbin and Strauss, 2014), and the *Handbook of Qualitative Research* (Denzin and Lincoln, 1994). It describes a general methodological approach for *"theory that is grounded in data systematically gathered and analyzed"* (Corbin and Strauss, 2014). A theory - according to Grounded theory - evolves through continuous interplay between analysis and data collection. The open-coding approach applied can be characterized as a *"general method of comparative analysis"* (Glaser and Strauss, 1980). This is particularly suited for qualitative data exploration as it provides a set of methods to systematically abstract empirical data to develop or validate a research theory (Vollstedt and Rezat, 2019). In essence, following Corbin and Strauss, Grounded theory includes different coding processes and constant comparison of new data collection. In iterative loops, new data sources and cases are continuously added to develop and refine the evolving theory. Starting with the *theoretical sampling,* the iterative process continues until a point of *theoretical saturation* - when additional data does no longer contributes to substantial theory development. In contrast to comparable qualitative research methodologies, the quality of Grounded theories is not evaluated based on standard testing criteria, i.e., data reliability, objectivity, and validity, but rather on respondents' credibility, plausibility, and trustworthiness (Vollstedt and Rezat, 2019).

3.2 Data Collection

Beginning with a set of three pilot interviews intended to revise the questionnaire's structure and wording, then a total amount of ten in-depth interviews were conducted over the period between March to May 2020. The final structure of the questionnaire was broken into four categories. The introductory section was followed by assessment of the Old and New Business Model Configurations, exploration of Key Business Model Changes along the way, and concluding by assessing the interviewees' Success Measurement. To ensure integrity of the data, especially the precise wording of respondents, the interviews were first recorded and then professionally transcribed.

3.2.1 In-depth semi-structured interviews

In-depth interviews are a direct primary data-collection method allowing the interviewee to thoroughly discuss a particular matter (Hennink et al., 2011). In-depth interviews can be further classified into either *a priori* structured or semi-structured interviews. While the former aims to prescript the exact interaction, the latter allows data collection to adapt during the process through a more flexible framework with room for additional material (Yin, 2016). Research design scholars state that in qualitative and exploratory research, semi-structured interviews are considered a particularly appropriate measure to collect primary data (Bryman and Bell, 2011; Edmondson and Mcmanus, 2007; Hennink et al., 2011). Also, since the theory development relied strongly on the insights of personal and individual experiences of experts, semi-structured interviews are suitable for investigating how entrepreneurs make decisions, what actions are undertaken, and how specific success measures are evaluated (Hennink et al., 2011).

3.2.2 Data origins

To compare entrepreneurial approaches and in particular which distinct parameters contribute to startup success, a multi-faceted perspective is needed to counter-balance respondent subjectivity. The idea was to capture a holistic picture of the founding process from all major stakeholders involved, i.e., the entrepreneurs and investors. Entrepreneurs are responsible for developing the business itself, applying tools and methodologies as well as following their business vision. They have practical insights into the advantages and limitations of either approach. Investors are an independent source of information and an external benchmark applying market-oriented evaluative criteria to judge success. Investors actively accompany their portfolio companies in an advisory role over a more extended period (Kullmar and Lallerstedt, 2017).

The concept of theoretical saturation depends on various parameters and is complex to determine. Ten appeared to be the appropriate number of entrepreneurs and investors to interview (Hennink et al., 2019; Saunders et al., 2018). The list of all interviewees can be found in Table 2, with a full description in Appendix B. All interviews were carried out in a direct one-on-one session and lasted, on average, 65 minutes.

Segment	Name	Company	Role
Entrepreneur	Holger G. Weiss	German Autolabs	Founder & CEO
Entrepreneur	Victor Splittgerber	Waku Robotics	Founder & CEO
Entrepreneur	Alexander Bernikas	TrendRaider	Founder & CEO
Entrepreneur	Hristo Borisov	Payhawk	Founder & CEO
Investor	Stephen Forte	Fresco Capital	Managing Partner
Entrepreneur	Andre Florido	Betmarkets	Founder & COO

Investor	Paul Orlando	Startups Unplugged	Founder
Entrepreneur	Magnus Kobel	YAS.life	Founder & CEO
Investor	Norbert Lemken	*Individual*	Business Angel
Investor	Peter Lennartz	*Individual*	Business Angel

Table 2 List of interviewees

Precise information on the interviewees, as well as the companies, can be found in Annex B.

3.3 Data analysis

The data generated from qualitative studies are pervasive, and since not all data are considered relevant, they must be carefully reviewed (Creswell, 2014). A common approach with interviews is to organize the relevant data into clusters by coding the transcribed interviews (Creswell, 2014; Hennink et al., 2011; Yin, 2014). There are two different types of codes - inductive and deductive codes - and usually, both types are applied in a study. Deductive codes derive from the theory underlying the study, while inductive codes derive from concepts that the respondents brought forward (Hennink et al., 2019). Both types were used in this study: deductive codes when concepts of either approach were discussed, and inductive codes when new vital issues emerged.

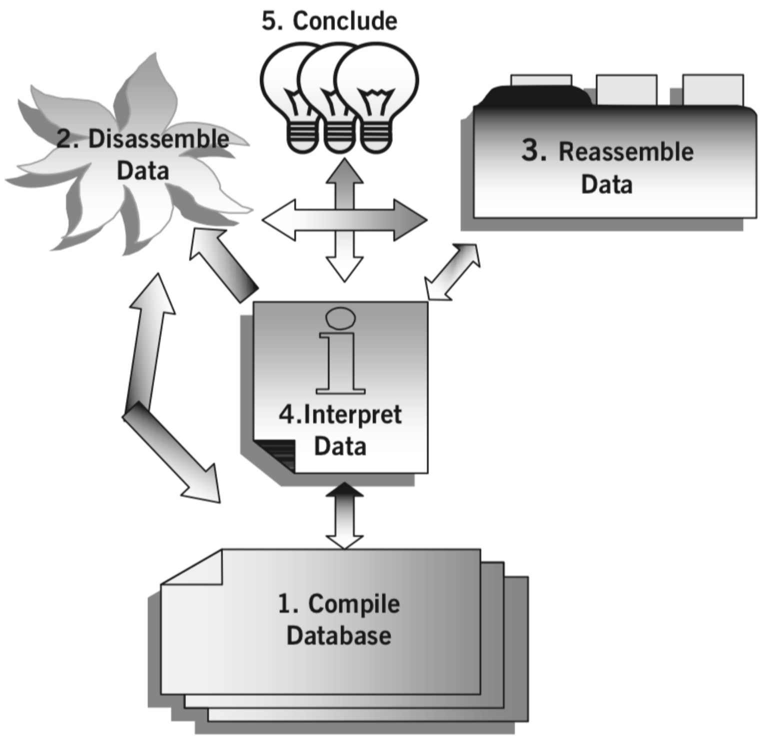

Figure 3 Five phases of analysis and their interactions (Yin, 2014)

The analysis followed the process described by Yin (2014), which is illustrated in Figure 3. It consisted of five steps: Compiling the data, decoding the data, combining the data, interpreting the data, and drawing conclusions. The first step involves compiling the notes from the field study and the data collection process; in this study, it represents transcription of the interviews. The second step of the process aims at breaking down the collected data into smaller categories by using codes, followed by the third step, in which the codes are clustered into topics. The second and third steps were repeated several times before an optimal categorization is achieved. Then the data is interpreted, which may require recompiling, disassembling, or reassembling the data in a new way. The final step is to conclude the entire study. This shows the iterative process of analyzing qualitative data.

The content analysis of the interviews was carried out by the open coding practice of the Grounded Theory methodology (Corbin and Strauss, 2014; Glaser and Strauss, 1980), i.e., using labels, concepts and themes to distill a theory from interviews, rather than the pure reproduction of facts (Glaser and Strauss, 1980). The empirical findings were coded using an open-source software package. Each inductive coding tree was based on both "in vivo" and constructed codes (Glaser and Strauss, 1980), recording the exact wording and the constructed wording. The codes related to the interviews were iteratively contextualized to group them into groups of first-order concepts. As a next step, those first-order concepts were categorized into second-order topics to abstract further their core educational value (Clark et al., 2010) and to assign the code to either of the approaches in the entrepreneurial decision-making process (see Annex C).

3.4 Data limitations and potential implications

The measurable validity, reliability, and comparability of qualitative and explorative data analyses are always complicated to ascertain. As described in Chapter 3.1, we have good evidence to assume adequacy of quantity and diversity in terms of both industry and the division between entrepreneurs and investors, as well as obviating theoretical saturation. Nevertheless, doubts remain regarding the extent to which this assumption holds true. It should also be noted that the selection of respondents is subject to various unavoidable filters. For example, interviewees who are particularly visible and available at the time were chosen. As a result, the selection of respondents may not reflect the real world of entrepreneurs and investors in all its diversity. This selection bias acts in favor of or against specific industries or degrees of maturity of companies. It should also be added that there may be a loss of accuracy, especially in qualitative interviews in which spoken language is the vehicle of data transmission. For example, particular annotations, cultural or demographic differences, etc., may lead to different interpretations or associations. These may lead to distorted results and thus negatively influence the evaluation. Finally, the quantitative measurements of success must be mentioned. We analyze the influencing parameters that motivate entrepreneurs and investors to prioritize one approach over the other. However, the significance of these actual factors as causal variables of success may be disputed. For example, the measurement of success using sales or financing figures is missing and exceeds the scope of this analysis.

4 Results and findings

In this chapter, the findings from the in-depth interviews will be described. The interviews were conducted with professionals from the field, entrepreneurs, and investors alike, to gain first-hand insights. The findings will be clustered according to categorization of the second-order topics: (1) business environment, (2) strategic agility, and (3) value creation and delivery. To gain better handling of the critical results, the findings will be further sorted by interviewees who are applying the LSM or the DO approach. A detailed summary can be found in Annex B.

4.1 Business environment

The second-order topic of business environment includes the first-order concepts of the notions of the 'company's stage', the 'business uncertainty', the overall 'market uncertainty', the 'duration of sales cycles' as well as the solutions' innovative degree, i.e., the 'type of innovation' (incremental or radical).

There are conflicting views regarding the influence of the 'company stage' concerning continuous iteration around customer feedback and different insights can be found here. Alexander Bernikas, for example, stated customer feedback tests had marginal influence on his company. In his view, the following rationale exists: *"In the beginning, you have many ideas, but you cannot implement them at all. Moreover, with increasing possibilities in resources to implement them, however, the dependency increases, and innovative strength decreases respectively"*. According to Bernikas, opposing views lead to a somewhat even distribution in re. the influence of customer tests. Stephen Forte's experience as an investor, however, tended to go in a rather contradictory direction. He argued that companies should increasingly test the business model in the market (e.g., through MVPs) at earlier stages since with increasing maturity dependency on the existing customer base grows. This fact, which Bernikas also addressed , is not be neutralized but does lead to decreasing use of the LSM. Also, it is interesting to include Paul Orlando's assessment. Orlando was assigned to the DO category even though the boundaries are difficult to delineate precisely[2]. It can be noted that start-ups *"in the early stage are not very locked into any position"*, which means that younger start-ups find it easier to change their market positions than established companies. Another point concerning the adoption of the LSM was related to the company's stage of development as a determinant of which practices were effectively implemented. Here, many startups claimed that they used the LSM mainly in their early development stage when preparing their business model for the approval of informal investors; however, founders also noted that the LSM could also prove useful in later development stages, as "VCs look for clues to market traction and lean startup approaches can show them your traction," -as Lemken put it. Several start-ups also stated that they use the LSM continuously in cycles and iterations because, as Bernikas said, "you never stop turning and iterating a digital service". However, differentiation in the application of the two approaches is more significant in the dimension of uncertainty, both on the business side and the market side. An example is Weiss, the founder of German AutoLabs. His approach can be assigned to DO and Weiss bridges the gap between degrees of business innovation and uncertainty: *"If you are extremely innovative, then you may be riding before a wave, right? If you say you want to exploit a trend, then you have to cope with the fact that the uncertainty is very high."* He continues by adding that German AutoLabs' *"product was the first one of its kind"* and that they have *"invented that category"*. While Weiss relates market and business uncertainty directly to his approach, Orlando abstracts this connection to a higher level. He illustrates this by referring to the rise of the large cloud storage providers after the dot-com bubble in the early 2000s, *"where there were high levels of unpredictability in their market"*. Despite the uncertain market and business model environment, he notes that *"they knew with a good degree of certainty that the cost of storage is going to decline year by year"*. Having this assumption in mind, the entrepreneur can formulate a business case, estimating that *"several years in the future, they are going to be able to break even"*. Through their commitment to subjective truths, they have developed their business model based on the

[2] In his conclusion, Orlando once again emphasized the difficulty of quantitatively measuring the gradual process of assigning decision-making processes to one of the two approaches. He states: *"I almost feel that the definition of [LSM] is such that even if you disagree with it, it is easy for someone who supports it to say that you are misinterpreting it. So, I wonder how honest we are in evaluating what is and what is not a lean startup; or what is instead more of a Peter Thiel vision. (...) I don't even know if it is possible to identify companies that are more likely to take a lean startup approach or a Thiel [DO] approach or other approaches. (...) Maybe you get to the point where you realize that they shouldn't do this business. You would get to that point sooner. So, it influences this sample. I don't know if you can get insights faster than through a Peter Thiel type process [DO]."* Consequently, it's difficult to make a precise distinction into binary categories.

hypothesis of declining costs for storage. Thus, Orlando's illustration is in line with Weiss' remarks.

Entrepreneurs who are more likely to use the LSM defined their market and business environment as more predictable or regulated. In this way, also Andre Florido da Costa described Betmarkets as *"the same business model as [competitors], but simply acting in a different market,"* which just *"needed some automation"*. The views of Christo Borisov, the founder of the Fintech Payhawk, coincided with this: *"From a market perspective, I think it is very certain because we are in the payment sector now"*. Payhawk has been built on the principles of the LSM from the very beginning, which was strongly advised by both entrepreneurs and the company's investors. Weiss' statement regarding the connection with innovative product categories pertains to Hypothesis 2). These correlations obtained by qualitative coding methodology are also supported by the literature (Sainio et al., 2012; von Gelderen et al., 2000). On the other hand, Magnus Kobel, for example, described how the market, despite no divergence from the initial product vision, can be considered *"very static"* This is due in particular to the legal framework of the *"target group of health insurances"*. Bernikas describes his view of the market environment as not very uncertain. This is mainly because *"the subscription-commerce business model is not so well established yet"*. With regard to market focus, further relevant aspects can be highlighted. All interviewees confirm the view that longer sales cycles make it significantly more difficult to perform tests in the market. Inevitably, collecting customer feedback is delayed and often more expensive due to higher resources needed to do it. Thus, Weiss added the factor of control over product development, which complements the overall theory. According to him, test and sales cycles in B2B markets are "are way longer". He added that the *"big difference between B2C and B2B is that in B2C, you are more or less in control of the product"*. In B2B, product elements need to *"link into existing platforms (...). In that case, you can only design parts of the product, and the rest needs to be adopted. Moreover, therefore, the development approach is very different."* Therefore, it remains debatable to what extent entrepreneurs in B2B markets can follow their vision. Nevertheless, it can be generally noted that pertaining to Hypothesis 1) at least for B2B, the application of the LSM is at a disadvantage. Initially, the relationship between market uncertainty and the depth of innovation was increasingly identified by the entrepreneurs in the interviews. At the same time, Felin and Zenger (2009) also point to disjunctive areas within these areas. It, therefore, makes sense to list contradictory aspects. Kobel, with YAS.life, for example, presents a different perspective. He would be traditionally assigned to the DO approach and he described the market in which he operates as rather static. In contrast, the innovation itself was radically new to the German market. Nevertheless, the data-driven approach of YAS.life, in particular, can be classified as novel and radically innovative in the market. He added: *"Just the fact that many say that they do not believe in it does not mean that your business model is wrong. That is exactly where the innovation starts"*.

4.2 Strategic agility

The second-order topic of strategic agility includes the first-order concepts of 'envisaging and adapting new strategies', 'focus on the vision' and 'founders' leadership and control' over the direction of the company. The first-order concept of 'envisaging and adapting new strategies' deals with the notion of strategies based on the initial vision and external factors. It further includes the adaptation of new business models in existing market niches.

When considering entrepreneurial ability and the required flexibility of business models to react to external factors, various dimensions can be identified. These can be either iterative and reactive or deterministic and visionary. In particular, the initial vision and the willingness to perform substantial pivots are important. Virtually all the entrepreneurs responded to external shocks to their business models. Florido da Costa, for example, mentioned that he *"quickly encountered an issue that is the lack of trust in the platform"*. However, Black Swan events, in particular, can also lead to either new potential opportunities being exploited or corresponding parts of the business model being adapted, such as *"companies that, just coincidentally, were built on the premise that happened to benefit from a lockdown situation or a situation where people are worried about their health and staying home more"*, as Orlando explained. A general trend in the results was that entrepreneurs who were vision-driven since the beginning tended to deviate less from their initial principles, even when confronted with external shocks. For example, Victor Splittgerber stated that the initial idea is *"basically an instinct that maybe there's something not fully functioning. It is a prediction that there is a value that is not captured"*. According to this, the potential opportunity remains stable even in changing market conditions. At the same time, he continued that flexibility is necessary *"E.g., somebody has an idea and we decide as a team that that's an idea worth pursuing"*. This aspect of necessary flexibility, despite pursuing one's own vision, is a leitmotif running through the interviews. This prompts the conclusion that if substantial pivots are actually required and the entrepreneur continues following the initial vision, market adjustments are necessary to achieve that vision. Kobel, for example, who claimed not to have pivoted at all, had to adapt the go-to-market strategy for the sake of the vision: *"We followed the strategy of having a B2C product first so that we can show that it works before we can sell it as a white-label B2B"*. This is not contrary to the vision-driven approach since the initial vision had to undergo certain product-market fit adjustments along the way. However, although this was the unanimous tone of the interviews, it is not a clear indication against the application of the DO approach. Forte even went one step further in encouraging entrepreneurs to actively seek outside opinions: *"they should be able to take the advice - sometimes conflicting advice from their board or their investor group"*. The task of entrepreneurs is to synthesize conclusions from external shocks or take directional influences from investors and incorporate them into strategy that both accords with the initial vision and distills what is best for the business. This notion of synthesis is very common among practitioners of the DO approach. This view lays the foundation for the business model to be developed. Weiss' described this process as *"very precise planning. And we definitely learned in that time that planning has a long and very difficult, calculable aspect"*. Lean Canvas entrepreneurs, alternatively, focus on a core vision that corresponds to subjective realities which is then pursued. As Kobel explained: *"Although we already set up the Lean Canvas with the first employee, the principle of a bonus program for pension funds and insurance companies already exists"*. Bernikas added, his *"experience repeatedly shows that it has to be a healthy mixture of hard figures, good intuition, and solid experience"*. Orlando and Forte added further perspective. For example, Orlando emphasized that *"in the early stage it is more gut feeling, since the metrics that you have are probably a little noisier"*. Forte, on the other hand, focuses on what motivates him as an investor. In particular, the *"product-market-fit in that market is something that excites you as an investor, and if you believe that this is something that could be big"*, which can be translated into the pursuit of an initial vision. However, the way founders' control and manage companies does not support a hard division between the LSM and DO approaches. Florido da Costa, for example, stated that *"you need to listen to what your customers are saying, and then it's your guiding lights"*. This view is also in line with the LSM whereby customer feedback determines the direction of the product. However, Splittgerber also added that the DO approach is more likely to determines further product development: *"And then you go out to develop your own ideas based on the needs of the customer"*. Therefore, no final theory can be derived from these discussions.

4.3 Value creation and delivery

The second-order topic of value creation and delivery deals with the first-order concepts of 'benchmarking around the competition', 'business planning', 'market positioning', and the process of 'identification of customer needs'.

The discussion about benchmarking against competition is one of the critical distinctions between the two approaches. However, it is interesting to note that in contrast to other first-order concepts, here there is a more precise differentiation between the two approaches. In general, entrepreneurs applying the LSM tend to be more likely to use competition as a benchmark for market positioning. This is contrasts with the DO approach, which either does not identify any relevant competitors or will not use them as a benchmark. Weiss stated that there is *"no direct competition but comparable product categories that we compared ourselves against"*. For the LSM, Florido da Costa stated that his company uses a *"two-axis comparison"* to *"understand how we should position ourselves"*. Borisov even went one step further with Payhawk. Benchmarking methods were not only indirectly put into relation with their USP, but also directly included in the methodology to gather customer feedback. Thus, Borisov pointed out: *"Yes, we did that in many interviews. We have been showing our competitors' website and were saying, what do you think?"* According to Borisov, this is *"the best benchmark for you because this is giving you the context against what you are going to be competing tomorrow"*. For the investors, intense competition was seen as an obstacle to innovation. Orlando stated: *"Build around the competitive landscape? Yes. However, comparing yourself to the competition early on? Probably not"*. Therefore, although competition to exists, at the same time companies should not orient their corporate strategy too much towards competition if they are seeking to design truly innovative products. Forte argued, *"we will walk away from super crowded businesses"*. His reasoning is rationally pragmatic: *"I would prefer things that have truly little competition. We hope that as they are the first to the market, that they would have the lion's share of that market"*. In terms of value creation, this makes sense and indicates how focusing on competition in innovative markets tends to be counterproductive.

Concerning identifying customer needs, Weiss stated that it *"took us two years to develop the product"*. Accordingly, direct feedback loops are not practical. Consequently, the preferred method is a dialogue with select customers. There is also a latency to be noted in this context: "*In our case, 14 months before they finally get the product in their hands, then we can deduct some consumer interest"*. This contrasts with direct B2C business models, which can exploit the possibility of immediate feedback loops. Florido da Costa mentioned using direct customer feedback about *"going to the markets to see if it sticks with your target audience"*. Bernikas also spoke of direct interaction with users via the homepage through intensive exchange *"via the comments on our website"*.

Thus, the conclusion to Hypothesis 3) can be derived from the analysis and the derivation of the coding theory. According to entrepreneurs, and investors and from users of the LSM and

DO approach, we have indicators to validate Hypothesis 3). The main reason for not applying the LSM seems to be product-market fit already achieved so no further processes are necessary for additional verification. Interestingly, analysis of these start-ups during the qualitative interviews revealed that almost all had been financed by institutional venture funds. The VC network already providing a kind of "linked market" for the start-up to develop. The responses were, therefore, arguably unconsciously biased as there were pre-existing relationships between companies and start-ups. However, the literature claims that even start-ups financed by venture funds could probably benefit from the LSM. The second reason was that the start-ups either considered the LSM to be inapplicable to the business idea and the business area of the start-up, or to be too complicated compared to traditional business planning.

5 Discussion

This study examined how start-ups use and implement either the LSM or DO, and to what extent these approaches are advantageous for defined parameters within the startup process.

By exploring the benefits and limitations of the LSM and DO, we conclude that while the LSM promotes solid reasoning and offers a wide range of applicable (and popular) tools, there are limits to who can benefit from the method. It seems that this depends mainly on what kind of business and product exists, i.e., depth of innovation the entrepreneur aims to develop. If the entrepreneur has a radical vision for a product potentially believed to be disruptive, then the lean start-up method could be problematic as it depends too much on customer feedback and encourages less risk-taking behavior. For entrepreneurs who either manufacture technologically advanced products or face long sales cycles (i.e., in non-B2C environments), it might also be more difficult to apply the LSM because it focuses on continuous product iterations. However, companies that manufacture incremental products could benefit from working strictly according to the LSM, as this could lead to a shorter time-to-market and more satisfied customers. This means that entrepreneurs are well advised to think carefully about what type of product to build and the vision of the company before deciding on one or more methods or tools. At the same time, our analysis shows that consciously refraining from using the LSM and consistently focusing on the founding vision can bring advantages in certain areas. For example, it has been shown that products with long sales cycles especially in the B2B secto, tend to benefit from customer interaction and feedback. This has implications for (prospective) entrepreneurs in terms of decision making and long-term business planning. Results also show that entrepreneurs, as well as investors tend to focus more strongly on their own version of the product when pursuing a DO approach. This means that iterating around potential competitors could become a distraction and dilute the entrepreneur's vision. Learning how the elements of value creation, delivery and capture become more or less relevant as the context changes can help entrepreneurs manage their efforts and allocate scarce resources effectively. And no preference for either method alone will guarantee success; the LSM will neither magically attract venture capital nor secure a market-leading position. Equally, the DO approach does not materialize the company vision nor enable monopolistic positioning in non-competitive markets. However, careful and reasoned selection of the entrepreneurial method can force the entrepreneur to think about what he/she wants to achieve and help optimize action.

Two further main limitations can be identified. LeCompte and Goetz (1982) argue that internal validity can be ensured by examining the data over more extended periods. This implies that the results of this thesis could become more accurate if the time frame were extended. The second limitation is the number of respondents. It is possible that a larger sample size could provide additional insights. Furthermore, a more significant number of respondents per product category could also provide more industry-specific characteristics.

6 Conclusion

This study presented a qualitative-explorative investigation of how startups adopt and implement the LSM or DO approach. The results are relevant for both the theory and practice of entrepreneurship. The study provides starting points for further research and field studies. In terms of practical value, this study can provide a set of guidelines and insights into the practice of introducing and implementing the two methods, and this may extend the currently available anecdotal evidence about common practices among entrepreneurs.

We can conclude that environments with direct customer feedback favor application of the LSM (Hypothesis 1). Furthermore, radical product innovations in an uncertain market environment are more likely to favor the application of the DO approach (Hypothesis 2). Finally, recommendations for an iteration of the business model based on the existing competition can be derived (Hypothesis 3). However, no evidence could be observed that one method is generally superior to the other.

The LSM has many benefits. In essence, it has led to a more experimental orientation of entrepreneurial activity, which is undoubtedly a welcome direction if applied appropriately. However, the LSM also has its limitations. The argument that hypotheses are simply a "fancy word for an assumption" (Blank and Dorf, 2012) incorrectly specifies the type of theory and guidance the LSM can give to start-ups and strategists. We can point to alternative research currents in the field of strategy and entrepreneurship (e.g., Camuffo et al., 2019; Felin et al., 2019; Felin and Zenger, 2009; Foss et al., 2019; Gans et al., 2018, 2019; Gavetti and Menon, 2016; Van den Steen, 2018), which emphasize the role of beliefs and commitment along with theories and problem-solving to entrepreneurship success. There are multiple variables that make the difference between success or failure and the rational entrepreneur must try to manage these and optimize for success.

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Appendices

A. Guidelines of semi-structured interview questionnaire

Design of the interviews: We started with two to three pilot interviews (not part of the theoretical sample), confirming that the questionnaire is precise, leads to fruitful discussions, and open enough to spark new insights.

Following the pilot interviews, we selected the relevant entrepreneurs, each representing a different case. As case studies profoundly rely on the correctness of the information provided by the interviewees, and we complimented the collected data by using multiple sources or "looking at data in multiple ways" (Eisenhardt, 1989; Yin, 2003).

As for the analysis of the gathered data, we applied the open coding practice from the Grounded Theory methodology. This framework is particularly suitable to study complex phenomena through a clearly defined procedure based on coding - i.e., labels, concepts, and words used to produce a theory from interviews rather than the mere finding of facts.

Semi-structured questionnaire (Entrepreneurs)

Introductory questions
- Can I record the interview?
- Do you wish to remain anonymous?

Opening questions
- What is your role in your organization?
- What are your previous professional experiences?
- Have you pivoted the business model throughout your organization's development?
    - If yes, how often?

(Old Business Model Configuration) *if applicable and potentially iterative*
- Have you based your business development on hypotheses?
    a. How did you derive those hypotheses?
    b. How did you test those hypotheses?

- What was your initial value proposition?
- Who were your initial target customers?
- How was the initial competitive landscape? How did you position yourself within that landscape?
- How did you organize your digital startup to create and deliver your value proposition to customers?
- Did you receive any external funding at that time?
    - If yes, how much and at what valuation? What were the most critical terms?
- Were you already making a profit?
    - If yes, how? What were your revenue model and revenue streams? What operations contributed to the value capturing process most? How much revenue did you make per month?
    - If not, why not? What monetization issues did your startup encounter?
- What was your cost structure?

New Business Model Configuration

- What is your (current) value proposition?
- Who are your customers?
- How is the competitive landscape? How do you position yourself within that landscape?
- How is your startup organized in order to create and deliver your value proposition to your customers?
- Did you receive any external funding (after the previous pivot)?
    - If yes, how much and at what valuation? What were the most critical terms?
- Are you making a profit?
    - If yes, how? What are your revenue model and revenue stream? What operations are contributing to the value capturing process?
    - If not, why not? What monetization issues is your digital startup encountering?
- What is your cost structure?

Key Business Model Changes

- What are the main changes to your startup concerning the way you create value? (For instance, have you changed your value proposition, value-creating operations, resources, and competencies, third party relationships, and/or your target customers?). Why did you make these changes? At what stage did you decide to make these changes?

- What are the main changes to your startup concerning the way you deliver value? (For instance, have you changed your distribution channels and the way you interact with your customers?). Why did you make these changes? At what stage did you decide to make these changes?
- What are the main changes to your startup concerning the way you capture value? (For instance, have you changed your revenue model and cost structure?). Why did you make these changes? At what stage did you decide to make these changes?
- How did you identify the problem and the need to make changes to your previous business model configuration? Did you employ any methodology, model, approach, tool, or instrument to support and enable this process?
  - Did the approach differ across the startup's development? How?
- How did you reach a solution? How did you know it was the right solution? Did you employ any methodology, model, approach, tool, or instrument to support and enable this process?
  - Did the approach differ across the startup's development? How?
- How would you define the changes introduced to your innovative business model? Radical or incremental?
- What would you say were the most critical steps, elements, and concepts that best describe this process of Business Model Innovation within your early-stage digital startup?

Measurement

- How do you measure your company's success? What metrics, milestones, KPIs, etc., do you use?
- How do you handle that information? What do you do with it?
- How do you adjust strategic plans and hypotheses accordingly? Is there a process? If yes, how is it structured?

Semi-structured questionnaire (Investors)

- What are your professional background and your role as an investor? Do you have any focus in terms of industry or preferred stage?
- Have you ever started your own company?
    - If yes¨ how many? In what field and what kind of companies?
- In how many companies have you invested?
- What makes you want to invest in a company? What are the key metrics and measurements you are looking for?
- How does the process look like when you choose to invest in a company? How does your Due Diligence look like? How do you assess the founders' ambition to create, deliver, and capture value?
- How do you find a potential investment? Is the process standardized?
- What are the critical success factors before an entrepreneur approaches you? What are your deal-breakers or red flags?
- What makes you not want to invest in an entrepreneur?
- How active is your role concerning strategic decisions in the companies you invest in? How do you engage in the strategic decision-making process? What is your approach? Does it vary? If yes: depending on what?
- How do you measure the success of your investments? What key metrics do you analyze along the development process and on what the startup needs to improve?
- What do you think about the concept of "Build-Measure-Learn"?
- Are entrepreneurs more prepared today? Do they have a more structured process? Based on your experience: How do entrepreneurs structure their processes to achieve product-market-fit?
- Do you see any trends among entrepreneurs today?

B. Full description of interviewees

Holger G. Weiss – Founder and CEO of German Autolabs

Weiss has an academic background in economics and Law from the Georg-August University of Göttingen and the University of Hamburg. He has furthermore more than 15 years of track record in managing technology-driven companies with a focus on consumer-centric services. He was with gate5 from the early days - a company active in mobile navigation, which was acquired by Nokia in 2006. The company was the foundation of HERE maps, which was taken over by three German carmakers in 2015 for almost three billion Euros. In 2008 he was one of the first investors of Aupeo, today's leading content platform for automotive. Since summer of 2010, Holger led the company as CEO. In April 2013, Aupeo was acquired by Panasonic Automotive Systems. Holger managed the integration and alignment after the acquisition. End of 2015, he stepped down as CEO to focus on new entrepreneurial challenges. He is also an active business angel and startup mentor and is involved with companies in Germany, UK, and the US. As a specialist for connected mobility, he also acts as a board member, conference speaker, and author.

German Autolabs builds automotive voice assistance for professional drivers. The full-stack voice platform is entirely customizable, easy to deploy and powers industry-tailored products for fleets and vehicle manufacturers globally. Designed by drivers for drivers, our offline-capable white label technology delivers a next-generation voice experience based on time, location, backend, sensor, and CAN bus data. German Autolabs' platform is device agnostic and can be embedded into IVI systems, retrofitted into fleet hardware or run app-only. German Autolabs has raised more than eight million of investments and currently employs 32 employees.

Victor Splittgerber – Founder and CEO of WAKU Robotics

Splittgerber has an academic background in Mechanical Engineering from the technical university of Dresden. He worked at the university as a lecturer in the field of "Next Urban Environment: Designing Cities for the Next Century" and was a consultant at the Leibniz Institute of Agricultural Research (ZALF). He has further experience as a founder of the Green City Solutions GmbH and WAKU Robotics. At Zalando SE, he had a position as the Head of Logistics Innovation and Robotics Excellence.

WAKU is making mobile robots more accessible by offering a pay-as-you-go rental solution, supported by independent consulting and a network of integration and servicing partners. Customers use WAKU Robotics as the one-stop-shop for trying out different robots, automating baseline, and compensating peak times. By connecting the entire ecosystem and creating the largest robot-pool, WAKU offers robot as a service at an unmatched level of flexibility, convenience, and price. WAKU currently employs six employees.

Alexander Bernikas – Founder and CEO of TrendRaider

Bernikas has an academic background in management, marketing, and computer science from the FOM college, as well as the HTW Berlin. He worked as head of the service department before the founded TrendRaider in 2014. He is furthermore the managing partner of the Passion4Trends GmbH.

TrendRaider is an innovative and dynamic start-up company from Berlin, which has dedicated itself to taking gifts and surprises to a new level. The product portfolio stands for sustainability and the trend factors innovative, regional, fair, organic, handmade, and upcycling. At the heart of the product range is the TrendBox, with lifestyle products from the categories fashion, accessories, gourmet, wellness, and design that change monthly. TrendRaider hunts these sustainable and hand-picked products for our customers and surprises them anew every month because each box has its theme that matches the current season. TrendRaider currently employs eleven employees.

Hristo Borisov – Founder and CEO of Payhawk

Hristo Borisov has a background in computer science and business administration from the American University of Bulgaria and co-founded fintech startup Payhawk.io in 2018. Less than a year later, the company already has paying customers, was selected among the five finalists in the international Pitch and Power Competition of Visa and Wirecard, and has closed investments of 3.6 million Euros. Still a computer science and business administration student at AUBG, Borisov began his career as a software developer for alumni-led company Telerik. He helped develop some of the award-winning products of the company that was acquired by U.S. giant Progress Software for $263 million in 2014. Borisov is also a founding member of the Citizens App, a mobile application that, in his words, “empowers polite and responsible citizenship through technology and mutual accountability.”

Payhawk issues next-generation company cards with automated expense management and discovery of subscription overspend on auto-renewals. They collect and analyze receipts, invoices, and card transactions to help to stay in control of the budget with no paperwork for employees. Payhawk currently employs 23 employees.

Stephen Forte – Managing Partner of Fresco Capital
Stephen Forte is a Managing Partner of Fresco Capital. Before Fresco, Forte was Chief Strategy Officer of Telerik, a leading vendor of developer and team productivity tools and acquired by Progress Software in 2014. At Telerik, Forte oversaw international expansion, partnerships, and corporate development. Previously, he founded and operated the Mach5 accelerator in Silicon Valley, AcceleratorHK, Hong Kong's first startup accelerator, and the Laudato Si' Challenge Accelerator, the Vatican's first accelerator. Forte was the co-founder of several startups, including Chassis Finder (acquired in 2012), Triton Works (acquired in 2010), and Corzen (acquired in 2007). Before Corzen, Forte served as the first CTO of venture-backed Zagat Survey in New York City (acquired in 2011) and also was a co-founder of the New York-based software consulting firm The Aurora Development Group.

Forte has an MBA from the City University of New York, did post-grad work at LSE, and has written several books on application and database development.

Andre Florido da Costa – Founder and COO of Betmarkets
Florido is the co-founder and COO of Betmarkets. Before joining Betmarkets, he worked in finance as an investment banker in the city of London. He graduated in finance from London Business School with Distinction. Betmarkets is an automated web platform where anyone can replicate the bets of professional betters. In essence, Betmarkets is trying to build kind of a very niche financial market within sports betting where the user can copy the bets of professional betters, just like in the financial markets with eToro. Betmarkets currently employs eight employees.

Paul Orlando – Founder of Startups Unplugged
Orlando has an academic background in business administration from Cornell University and Columbia Business School. He guided hundreds of companies to help them grow, improve customer conversion, develop new products, raise capital, and more. Orlando's work includes building innovation programs, internal incubator/accelerator programs, and product development.

He founded and led startup accelerators on three continents and built Hong Kong's first funded startup accelerator and led an environmental-focused program partnered with the Vatican in Rome. As founding director of the on-campus startup incubator/accelerator at USC, he advises alumni, students, and faculty operated businesses. Orlando is furthermore a professor in USC's entrepreneurship department. Along the way, he became passionate about the study of the unintended consequences of technology and regularly wrote about that. Orlando was part of a winning team at the TechCrunch Disrupt hackathon, and his work has been featured in Forbes, TechCrunch, Wall Street Journal, NY Times, and other publications.

Magnus Kobel – Founder and CEO of YAS.life
Kobel has an academic background in finance and entrepreneurship from the University of Bayreuth, where he completed his Ph.D. in 2004 with studies of Venture Capital and Private Equity. He has been furthermore working in the insurance sector since 2005, first as assistant to the Board of Management at Allianz and then in Corporate Development at Allianz Private Krankenversicherung. Then he was a management consultant for seven years with a particular focus on health insurance.

YAS.Life is a Berlin-based start-up with the vision to become the market leader in digital health services for life and health insurance companies by rewarding a healthy lifestyle. With the YAS app, users are motivated to live a healthier and more conscious life. Reward partners such as SportScheck, Garmin, Urban Sports Club, foodspring, and many more support YAS.life to make the app experience even better for users and encourage them to continue. Together with Deutsche Rückversicherung AG as lead investor, YAS.life makes the app available to various B2B partners and then develops tailor-made digital solutions in consultation with them. In cooperation with, among others, BMW, BKK RWE, mhplus, VKB, and the first life insurance company (LV1871), numerous digital bonus programs have already been developed and evaluated as successful based on the data. YAS.life currently employs 31 employees.

Norbert Lemken – Individual business angel
Lemken worked as a specialist Agricultural Policy & Environmental Issues and Communications Manager, is responsible for internal communications and the trade press on all issues related to agricultural policy and Environment. He was furthermore the head of media relations and the representative liaison office in Berlin as a Senior public affairs manager at

Bayer CropScience. After being the Director of Agricultural Policies at Bayer, he served as a Head of the representative office of the Schwarz group in Berlin. Besides his work at Bayer and the Schwarz group, he is an active business angel in the entrepreneurial ecosystem.

Peter Lennartz – Individual business angel

Lennartz has an academic background in economics from the University of Hamburg. He worked as the Leader of Ernst & Young Technology and Media & Entertainment Sector Germany, Austria & Switzerland. He furthermore founded and worked as the Head of Start-up Services at Ernst & Young in Berlin, including all Service Lines, special Start-up Packages Additionally, he is a partner of partner assurance and financial accounting and advisory services at EY and manages clients in technology, media, life science, healthcare, cleantech. In his function as an auditor, he advises technology companies as well as companies from the healthcare, medical technology, pharmaceutical, and biotechnology sectors. Peter Lennartz is a specialist for US-GAAP as well as IFRS and knows the requirements of medium-sized and young companies through his involvement in the EY competition "Entrepreneur of the Year".

Peter Lennartz supports start-ups that offer innovative business models with digital solutions. In doing so, he primarily promotes the connection with established companies in order to support their digital transformation. Besides his work, he is an active business angel in the entrepreneurial ecosystem.

C. Open-coding concepts

Second-order topic and category	First-order concepts
Business Environment	Business uncertainty
	Company stage
	Duration of sales cycles
	Market uncertainty
	Type of innovation
Experimenting and testing	Focus on waste reduction
	Hypotheses formulation
	Hypotheses testing
	Iteration and pivoting
	Success measurements
Strategic agility	Envisaging and adapting new strategies
	Focus on vision
	Founders' leadership and control
Value capture	Pricing strategies
	Revenue streams
Value creation	Benchmarking against the competition
	Business planning
	Market positioning
	Product development process
Value delivery	Channel deployment
	Customer Segment
	Identification of customer needs

Table 3 Overview of second-order topics and first-order concepts

Open-coding concepts	DO	LSM	Total
business environment/business uncertainty	6	2	8
business environment/company stage	2	3	5
business environment/duration of sales cycles	5	1	6
business environment/market uncertainty	8	9	17
business environment/type of innovation	10	8	18
experimenting and testing/focus on waste reduction	8	4	12
experimenting and testing/hypotheses formulating	14	7	21
experimenting and testing/hypotheses testing	25	31	56
experimenting and testing/iteration and pivoting	10	10	20
experimenting and testing/success measurements	21	14	35
strategic agility/envisaging and adapting new strategies	16	6	22
strategic agility/focus on vision	23	4	27
strategic agility/founders' leadership and control	13	4	17

value capture/pricing strategies	4	1	5
value capture/profitability and revenue streams	4		4
value creation/benchmarking against competition	8	9	17
value creation/business planning	6	1	7
value creation/market positioning	4	7	11
value creation/product development process	2		2
value delivery/channel deployment	2	1	3
value delivery/customer segment	10	4	14
value delivery/identification of customer needs	5	4	9
Total	**206**	**130**	**336**

Table 4 Concept comparison of LSM and DO