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Strategy Testing as an Interplay between Strategy

Formulation and Implementation?

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"With your mind power, your determination, your instinct, and the experience as well, you can fly very high"

Ayrton Senna da Silva (1960 – 1994)

This thesis paper marks the end of my study in Business Administration at the University of Twente. Realizing that education should not be taken for granted, I will always cherish the moments along the way, both, the good ones, and the difficult ones. Although my journey at the University has come to its final end, the learning process will not, it will never end. I would like to take this opportunity to thank the people that played a part in the final phase of my educational journey.

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Abstract

The evolution of the competitive playground in which organizations are operating in has resulted into more complexity, shorter product life-cycles, and markets that appear and disappear at an alarming rate. Several studies have demonstrated pessimistic prospects about the chances of survival for start-ups. For this paper, the premise is made that (successfully) executing on a plan that does not work is at the heart of strategic failures. The study elaborates on the thought that strategy testing serves the goal of making better strategic decisions based on proven strategic initiatives, which ultimately enhance business success. An elaborated literature review identified five approaches which can be used for the purpose of strategy testing, i.e. checklist assessment, Pre-mortem analysis, interactive simulations, Scrum, and the Lean Startup methodology. However, academic research is limited on the actual application of these approaches in practical settings. The aim of this paper was to identify whether organizations test their strategies in advance of (full) implementation, how they perform this activity, and what challenges and benefits they experience.

Due the exploratory nature of this study, a qualitative research approach has been chosen. The data was collected from eight early stage IT-ventures by means of semi-structured interviews with executives. The audio-recorded interviews where translated into transcripts, analysed, and processed by usages of coding technique.

The findings of this study demonstrate that the majority of the case ventures aren't systematically testing their strategies. In fact, most of the ventures pay limited attention to their strategy development process. Only one case venture applies the Lean Start-up methodology (LSM) in accordance to the process identified in the literature review of this paper, whereas the other cases are merely using the element of a minimum viable product. The Scrum framework is used partly or loosely for product development purposes by five case ventures and only applied strictly by one venture. In addition, none of the other three validation approaches are used for strategy validation purposes, or used at all. The reasons for not applying checklist assessments, Pre-mortem analyses, and interactive simulations are because of: a lack of a formalized strategy, unfamiliarity with approaches, and a low perceived rivalry within the business environment. With exception of two ventures, all cases initially have put a premium on product aspects, rather than validating their customer's real problem in advance. Moreover, the majority of the case ventures demonstrated a poor application of systematic measurements. Finally, the case analyses identified the following key challenges: product-market fit, confusion about the concept of a MVP, managing the workload, and finding the right pricing model.

There are three main points of attention which are derived from this study's findings: 1) applying elements of an approach is not the same as applying the approach, 2) strategy is more than a product, and 3) meaningful testing requires measurements. Firstly, as identified in the case analyses, the majority of the case ventures are applying certain elements of Scrum and the LSM. However, by using loose elements of these approaches the essence becomes (partially) obsolete since of the elements of these frameworks are interconnected with other. Secondly, the research findings identified a predominant emphasis on the product offering by the case ventures. However, other elements of strategy should be taken into consideration as well. Thirdly, strategy testing involves measuring. This implies that measurement instruments need to be in place to make testing meaningful.

Furthermore, this research paper can assist managers and executives to gain insights in strategy testing methods. In addition, strategy testing prior to fully implementation might provide new insights in factors the organization should take into consideration and makes problems visible, which make strategy makers redefine their strategy into a more feasible one. Moreover, this study invites academics to position strategy testing as an intermediating element between strategy formulation and implementation, rather than performing strategy evaluation as a final phase in the strategic management process.

Future scholars are encouraged to elaborate on though of strategy testing prior to (full) implementation and making additional contributes towards a general framework for strategy testing.

List of abbreviations

- BW Business Wargame
- BM Business Model
- CD Customer Development
- PD Product Development
- e.g. exempli gratia—for example
- i.e. id est-that is
- LSM Lean Startup Methodology
- MLP Minimum Lovable Product
- MMP Minimum Marketable Product
- MVP Minimum viable product
- TPM Toyota Production System

List of tables

Table 1:	Checklists for strategy testing	15-16
Table 2:	Advantages and disadvantages of checklist assessments	17
Table 3:	Advantages and disadvantages of pre-mortem analyses	19
Table 4:	Advantages and disadvantages of BWs	24
Table 5:	Advantages and disadvantages of Scrum	28
Table 6:	Advantages and disadvantages of LSM	33
Table 7:	Comparison of key advantages and disadvantages	34
Table 8:	Overview key characteristics of the five strategy testing approaches	35
Table 9:	Data collection sample	
Table 10:	Key findings case venture one	43
Table 11:	Key findings case venture two	46
Table 12:	Key findings case venture three	49
Table 13:	Key findings case venture four	51
Table 14:	Key findings case venture five	54
Table 15:	Key findings case venture six	57
Table 16:	Key findings case venture seven	59
Table 17:	Key findings case venture eight	62
Table 18:	Opportunity Identification	63
Table 19:	Case comparison strategic approaches	64
Table 20:	Strategy formulation	64
Table 21:	Case comparison validation approaches	65
Table 22a:	Strategy Validation	65
Table 22b:	Strategy Validation	66
Table 23:	Non-applies validation approaches	67
Table 24:	Case comparison measurement areas	68
Table 25:	Case comparison measurement approaches	68
Table 26:	Measurement areas and approaches	69-70
Table 27:	Experienced benefits	70-71
Table 28:	Case comparison of strategy validation challenges	72
Table 29:	Experienced challenges with Product-Market fit	72
Table 30:	Experienced challenges Product-Market fit	73
Table 31:	Experienced challenges Minimum Viable Product	73
Table 32:	Experienced challenges with pricing model	74
Table 33:	Experienced challenges with managing workload	74
Table 34:	Taken & planned actions	75
Table 35:	Interview Guide	90-92

List of figures

Figure 1: coding interview transcripts	39
figure 2: categorizing codes	39

Table of Contents

2	1. Introduction	8
1	.1 Situation & Complication	8
1	.2 Theoretical background	10
1	.3 Research aim; central research question and methodological approach	10
1	.4 Academic and practical contribution	11
1	.5 Thesis outline	11
2. L	iterature Review	12
2	.1 Increasing the likelihood of strategic success by strategy testing	12
	2.1.1 The cumbersome of estimating strategic success	12
	2.1.2 Definition	12
	2.2.3 Literature review process	13
2	.3 Strategy testing approaches	14
	2.3.1 Checklist assessment	14
	2.3.2 Pre-mortem analysis	18
	2.3.3 Interactive simulations: Business Wargames	20
	2.3.4 Scrum	25
	2.3.5 Experimentation: Hypothesis-driven strategy testing	29
	2.3.6 Cross-approach comparison	34
3. N	Nethodology	36
3	.1 Research Framework	36
	3.1.1 Philosophical Worldview	36
	3.1.2 Research Design	36
	3.1.3 Research Method	36
3	.2 Data Collection	37
	3.2.1 Preparing the semi-structured interviews	37
	3.2.2 Unit(s) of analysis	38
3	.3 Data analysis	39
3	.4 Quality of Research	40
4. R	esults	41
4	.1 Within-Case Analysis	41
	4.1.1 Case 1: HR-Tool	41
	4.1.2 Case 2: Strategy Growth Mapping	43
	4.1.3 Case 3: Data-Analyser	46
	4.1.4 Case 4: Web-Support	49
	4.1.5 Case 5: Customer Feedback	52

4.1.6 Case 6: Community Platform	. 54
4.4.7 Case 7: Crowd-Resourcing Platform	. 57
4.4.8 Case 8: Animation Tool	. 59
4.2 Cross-Case Analysis	. 63
4.2.1 Opportunity identification	. 63
4.2.2 Strategy	. 63
4.2.3 Strategy Validation	. 64
4.2.4 Measurement	. 68
4.2.5 Benefits	. 70
4.2.6 Challenges	. 71
4.2.7 Solutions	. 75
5. Conclusion & Discussion	. 77
6.1 Scientific implications	. 78
6.2 Practical implications	. 79
6.3 Limitations & Future Research	. 79
References	. 81
Appendix 1: Interview Guide	. 91

1. Introduction

1.1 Situation & Complication

Understanding how and why some firms outperform others is at the heart of strategic management. A compact definition of strategic management is stated as "the analyses, decisions, and actions an organization undertakes in order to create and sustain competitive advantages" (Dess et al., 2012, p. 48). According to Dess et al. (2012), there are three interdependent basic elements in the strategic management process of decisions and activities which lead to the development and practice of strategies: strategy analysis, strategy formulation and strategy implementation. Wheelen and Huger (2012) added a fourth element of evaluation & control within the domain of strategic management. However, there are three flaws in the strategic management domain that has triggered to address the element of 'strategy testing'.

Imbalance of academic attention to strategic management elements

To date, there is definitely no shortage of (scientific) literature within the field of strategic management, and strategy in general. Strategy formulation concerns "decisions made by firms regarding investments, commitments, and other aspects of operations that create and sustain competitive advantage" (Dess et al., 2012, p. 54). The formulation of strategy is often viewed from the mechanistic perspective as a rational plan; i.e. "a posture between mutually supporting organizational elements, such as activities and organizational structure, and environmental elements, such as customer groups" (Farjoun, 2002, 563). In their work, De Wit and Meyer (2010) describe the formulation process as: 1) identification of opportunities and risk; 2) determining the company's material, technical, financial and managerial resources; 3) personal values and aspirations of senior management to decide what to do; and 4) acknowledgement of non-economic responsibility to society. Whereas strategy formulation deals with the development of long-range plans, strategy implementation actually puts the strategy into action (Wheelen and Hunger, 2012). A concise definition of strategy implementation states that it is "the communication, interpretation, adoption, and enactment of strategic plans" (Noble, 1999, p. 120). However, strategy implementation has attracted notable less attention than strategy formulation (Aaltonen and Ikävalko, 2002; Alexander, 1985; Al-Ghamdi, 1998; Raes et al., 2011). Some authors suggest that this imbalance between the aforementioned two elements is because of: formulating or designing a strategy is according to Alexander (1991) more of a glamorous top management activity (Aaltonen and Ikävalko, 2002), some strategists assume that strategy formulation is the only necessary element for strategic success and implementation is just a relatively straightforward operationalization of a clearly articulated strategic plan (Noble, 1999), strategy implementation is "often seen as something of a craft, rather than a science" (Blahová and Knápková, 2011, p. 61), strategy implementation is more complex (Siciliano, 2002), and MBA programs are more focused on strategy formulation and planning (Hrebiniak, 2006). Moreover, a keyword analysis indicated that substantially less academic attention has been given to the element of strategy testing.

Strategic failures in practice

Various authors ascribe strategic failure in practice to two main streams of causes. Firstly, different authors claim that it is not bad strategy formulation, but rather bad strategy implementation, that can be allocated to strategic failures—the formulation-to-implementation gap—and/or poor performance—strategy-to-performance gap (Allio, 2005; Crittenden and Crittenden, 2008; Mankins and Steele, 2005; Miller, 2001; Speculand, 2009). Elaborating on this thought, strategy implementation failure rates are reported up to 70 percent (Beer, 2000; Miller, 2001; Nutt, 1999; The Economist, 2013). However, it is worth noting that strategy implementation failure rates reported by a variety of authors are often based on evidence that is "outdated, fragmentary, lacks scientific rigour or is just absent" (Cândido and Santos, 2015, p. 254). For this reason, Cândido and Santos (2015) concluded that the actual rate

of strategy failure might be difficult to determine. Secondly, various authors were triggered by assumingly high failure rates of start-ups. Shane (2008) illustrates the survival of US start-ups originated in 1992 with a survival rate of respectively 45 percent after five years and 30 percent after ten years. He further states that "[...] no matter which developed country you look at, it appears that only half of new firms started remain in business for five years, and less than one-third last ten years" (Shane, 2008, p. 98). This statement is supported by Bangma and Snel's (2009) study about the survival rate of Dutch start-ups in the period from 1987 till 2008, i.e. ten percent was out of business after one year, and about half of the start-ups was out of business after five years after their foundation. Feinleib (2012) is even more pessimistic about start-ups' survival rates by claiming that about eight of ten new businesses fail within three years after their foundation. Although these numbers should be interpreted with caution as Shikhar Ghosh—a senior lecturer at Harvard Business School—mentions, "If failure means liquidating all assets, with investors losing all their money, an estimated 30% to 40% of high potential U.S. start-ups fail [...], if failure is defined as failing to see the projected return on investment—say, a specific revenue growth rate or date to break even on cash flow—then more than 95% of start-ups fail" (Gage, 2012). Instead of ascribing start-ups failures as a poor execution of intended plans, some authors like Blank (2012), Ries (2011), and Maurya (2012) imply that it's rather the (business) plan itself that could be ascribed as the root cause of these failures. These authors addressing this dilemma by elaborating on the thought of strategy validation, a terminology this paper intertwines with strategy testing.

New business environments

The practice of doing business during the previous century was predominantly influenced by streams of practitioners who embraced the philosophy of Fordism and Taylorism with a focus on rationalisation, standardization and elimination of uncertainty (McCarthy & Tsinopoulos, 2003). However, the growing intensity and consequent increase in complexity of competition during the 1980s and 1990s within business environments had profound implications for the evolution of strategic management and the way organizations are managing their businesses (Grant, 1996). The 'rules of the game' for todays markets require anticipation on different dimensions, which have demonstrated to change frequently (Bessant et al., 2002). Current global competitive business environments are characterised by demand for greater product variety (Bessant et al., 2002; McCarthy & Tsinopoulos, 2003), changes in demand (Eisenhardt, 1989), changes in technology and competition (Bourgeois & Eisenhardt, 1988; Silverblatt & Korgaonkar, 1987), shorter product life-cycles (Bassant et al., 2002), unstable economic conditions (Silverblatt & Korgaonkar, 1987), and shortening shelf-life of business opportunities (Trimi & Berbegal-Mirabent, 2012). This evolution of the competitive playground has resulted into a higher degree of complex, dynamic and unpredictable business environments (Acur & Englyst, 2006), thus making succeeding and survival within these business environments more difficult (Agarwal et al., 2006; Silverblatt & Korgaonkar, 1987). In fact, these evolvements result in markets to appear, mutate and disappear at an alarming rate (Goldman et al., 1994). As stated by Acur and Englyst (2006), "for most organizations, the dynamic process of adjusting to environmental change and uncertainty-of maintaining an effective alignment with the environment while managing internal interdependencies—is enormously complex [...]" (p. 547), but nevertheless should be projected into the organization's strategy. Trimi and Berbegal-Mirabent (2012) argue that organizations within technology-intensive industries might be confronted with even higher degrees of uncertainty, since new know-how technologies are often characterised by volatility and unpredictability themselves. The degree of volatility marks the change and predictability within an organization's business environment (Judge & Miller, 1991) and results in information that "is often inaccurate, unavailable, or obsolete" (Bourgeois & Eisenhardt, 1988, p. 816). Indeed, Eisenhardt (1989) stresses that the disruptions in technology enforces rapid decision-making. In her study, she concluded that fast decision-makers used more information, considered more alternatives, and made centralized decisions supported by counsellors. One might argue that organizations confronted with volatile business context, and a higher degree of uncertainty, are putting a premium on strategy testing prior to fully implementation.

1.2 Theoretical background

The three above-mentioned issues, both in the academic base of knowledge and practical settings, formed the trigger for this study to emphasis on the thought of strategy testing-validation. In the strategic management process, evaluation and control is placed after strategy formulation and implementation (Wheelen and Huger, 2012). This after-the-fact rationalization, strategic hindsight, aims to enhance organizational learning by seeking for explanations from both failure and success (McKenna, 2011; Mitchell et al., 1989). However, this implies that an event first has to occur-or partially occur-what might obsolete the process of evaluation when an organization has faced a catastrophic downturn. Different approaches have already been proposed to evaluate intended strategic plans, to act upon the learnings from those activities, and thereby increasing the likelihood of strategic success by bringing forward the evaluation phase, rather than doing this activity as a final step in the strategic management process. Klein (2007) for example, introduced a technique that is based on the principle of prospective hindsight, i.e. explaining future events as past (Mitchell et al., 1989). Kraaijenbrink (2015) has included strategy assessment into his strategy generation process and reasons that checklists can be used for both, assessing an organization's current strategy, or a newly generated strategy before execution has started. As argued by Schwarz (2011), "managers need to prepare for change and look for new constellations for better ways to reallocate their resources and to position their companies in the market" (Schwarz, 2011, p.122). In order to deal with this challenge, managers must develop sufficient ex ante strategy evaluation processes to avoid corporate failure, a domain which appears to be underrepresented (Schwarz, 2011). The overall goal of ex ante evaluation is to assess the consequences of a particular strategic decision in respect to the organizational environment and future impact of the own strategy and those of competitors, prior to implementation (Schwarz, 2011). A relatively young approach to deal with the practical problematics which were mentioned in previous paragraph is popularized by authors such as Blank (2013a), Ries (2011) and Maurya, 2012), who call for validation of a business idea in the earliest stage of the organization. These authors propose a hypothesis-driven approach as an antidote for the lethal problem of successfully executing a plan that leads nowhere, by seeking for a business model that works (Ries, 2011; Maurya, 2012). Although their different characteristics, focus areas, and strengths and weaknesses, all these approaches share the same purpose, i.e. strategy testing-validation. However, academic research is limited on the actual application of these approaches in practical settings. As a result, limited insights are available about which approaches are favoured and what challenges and benefits are experienced by applying them in practice.

1.3 Research aim; central research question and methodological approach

This study elaborates on the thought by authors like Blank (2012), Ries (2011), and Maurya (2012) who imply that it's the (business) plan itself that could be ascribed as the root cause of strategic failures. For this reason, this paper addresses the subdomain of strategy testing and will elaborate on the thought that testing a strategy before (full) implementation might contribute to avoid disappointing results from strategic decisions afterwards. The aim of this paper is to identify whether organizations test their strategies in advance of (full) implementation, how they perform this activity, and what challenges and benefits they experience. Derived from the aforementioned research aim, the following central research question is formulated.

Which approach can early stage IT-ventures use to test their strategies prior to implementation?

In order to understand the underlying motivation of organizations' testing approaches, the following sub questions are formulated:

- Which strategy testing approaches are documented within the academic literature?
- Which strategy testing approach(es) are used by early stage IT-business ventures?
- Why do organizations adapt certain strategy testing approaches in favour of others?
- What are the perceived challenges and benefits from their approaches?

In this research study its context, testing is defined as "the process of executing a program with the intent of finding errors" (Myers et al., 2011, p. 11). However, as mentioned earlier, strategy testing and validation are used intertwined in this paper, where validation implies "the process of evaluating the logical arguments and scientific evidence that support claims" (Taylor, 2013, p. 2). The reason for considering both of these concepts is to broaden it applicability and arguably, because they complement each other well for the purpose of this study.

Due the explorative nature of this research, an inductive research strategy has been chosen. Since the underrepresentation of existing theory on strategy testing approaches—in contrast to strategy formulation and implementation—and the ability to identify the units of analysis, a multiple-case study design will form the foundation of this study. A multiple-case study design is chosen above a cross-sectional design, because the focus is on the unique context of the cases–IT-business–, thereby making a multiple-case study design more appropriate (Bryman and Bell, 2011). As units of analysis, organizations were selected on two criteria. Firstly, this study selected start-ups or young venture in their formation or early growth stage. Secondly, the organizations should had a comparable business context. For this study, organizations operating in the e-business industry were selected because of the expectation, based on literature study, that these ventures are able to conduct strategy testing activities more easily, thereby increasing the likelihood to gather more relevant data and insights for this study. Also, the expectation was that these ventures where more easily to identify and approach.

The data has been gathered through semi-structured face-to-face interviews with (senior) executives or founders. Although, an interview guide was used as a broad guideline, the interviewees still had enough leeway in how to reply to the questions (Brymann & Bell, 2011). More specific, the laddering technique during interviews with their repeating "why" questions on prior answer were performed to grasp the underlying logics and motives behind answers. Subsequently, the interviews were audio-recorded and translated into interview transcripts. Finally, the coding technique has been used for translating the data into interpretative research results.

1.4 Academic and practical contribution

This research contributes to the base of knowledge within the strategic management domain for the following reasons. Firstly, it aimed to provide exploratory insights in the way organizations approach strategy testing, a subdomain which is currently not addressed in in the same extent as strategy formulation and strategy implementation within the strategic management literature. Secondly, based on the research findings, it targets to set an additional step towards the develop of a conceptual framework, i.e. theory building. The generalizability of the study is presumably low, however this was not a pre-condition since the exploratory nature of the study. Thirdly, positioning strategy testing as an interplay between formulation and implementation may contribute to bridge the formulation-toimplementation gap. Finally, this research aimed to gather insights for other academics to (empirically) elaborate on. In addition, this research has practical relevance as well. Firstly, strategy testing prior to fully implementation might provide new insights in factors the organization should take into consideration and makes problems visible, which makes strategy decision-makers redefine their strategy into a more feasible one. Secondly, strategy testing ought to contribute to more effective strategy implementation, which in turn, can be a competitive advantage itself. And last, strategy testing brings together strategist and implementers in an early stage of the strategic management process.

1.5 Thesis outline

The next section of this paper, the literature review, will discuss theory concerning strategy testing methods. The up following section will present the methodological approach which was adapted for this research. Subsequently, the results of the interview data collection has been translated into interpretative results. The conclusion section will link this papers' overall findings back to the predetermined research question. Finally, a discussion on the contribution, limitations, and suggestions for future research will be discussed.

2. Literature Review

2.1 Increasing the likelihood of strategic success by strategy testing

2.1.1 The cumbersome of estimating strategic success

Making the correct strategic decisions remain a key challenge for executives and often don't turn out in a satisfying way. Authors like Allio (2005), Beer (2000), and Miller (2001) for example, attribute strategic failures to poor implementation, rather than the formulated strategy itself. In contrast, Blank (2013a), Blank & Dorf (2012), Ries (2011), and Maurya (2012) ascribe strategic failure to bad business plans instead. This ambiguity about what causes strategies to fail in practice forms a prevalent discussion within the research field of strategic management (Childress, 2012). The dilemma for many executives is that to find out whether a strategic hindsight, aims to enhance organizational learning by seeking for explanations from both failure and success (McKenna, 2011; Mitchell et al., 1989), and forms a subsequent phase in the strategic management process after strategy implementation (Wheelen & Hunger, 2012). However, rather than discovering whether a strategy will succeed after being implemented, this study positions this activity prior to the (full) implementation stage, i.e. strategy testing—validation.

"The logic of validation allows us to move between the two limits of dogmatism and scepticism"— Ricoeur (1991)

According to Githens (2011), having the right strategy is perceived as the key success factor for strategic initiatives by CEOs. This author argues that a valid strategy must meet the following two criteria: 1) a distinct problem must be matched with an effective solution, and 2) the organization must have the necessary resources and organizational structure in place to act upon this solution. Nowadays, organizations are confronted by high velocity business environments resulting in markets to appear, mutate and disappear at an alarming rate (Goldman et al., 1994), thus shortening the shelf-life of business opportunities (Trimi & Berbegal-Mirabent, 2012). These business evolvements are argued by this research study to put a premium on strategy validation before (full) implementation and commitment. As pointed out by Ricoeur (1991), "the logic of validation allows us to move between the two limits of dogmatism and scepticism. It is always possible to argue for or against an interpretation, to confront interpretations, to arbitrate between them, and to seek for an agreement [...]" (p. 160). This study elaborates on the thought that strategy testing—validation—serves the goal of making better strategic decisions based on proven strategic initiatives, which ultimately enhanced business success.

2.1.2 Definition

Three key terms were identified that cover the focal unit of analysis of this study, i.e. (strategy) testing, validation, and ex ante strategy evaluation. Testing is defined as "the process of executing a program with the intent of finding errors" (Myers et al., 2011, p. 11). In addition, Taylor (2013) defines validation as "the process of evaluating the logical arguments and scientific evidence that support claims" (p. 2). And thirdly, an ex ante strategy evaluation is defined by Schwarz (2011) as "testing strategies prior to their implementation" (p. 122). For the purpose of this research study, two terminologies are used intertwined, strategy testing and strategy validation. For the remaining of this research paper, when these terms are used, it refers to the following conceptualization:

"The process of finding errors and support for an intended strategy, due evaluation of logical arguments and scientific evidence, prior to (full) implementation"

2.2.3 Literature review process

For the purpose of answering the first sub-question, identifying strategy testing approaches within the academic literature, and building a sound foundation for the operationalization of this study's empirical research, the following process has been followed for the literature review.

Orientation phase

In this first phase of this study, an orientation has been done into the topic of interest, i.e. strategy testing. For this purpose, various books and online data-bases were consulted such as Google, Google Scholar, Scopus, University of Twente, and sEURch—library of Erasmus University of Rotterdam. Firstly, identification of the position of strategy testing within the strategic management literature was done. Secondly, the online data-bases were used for identifying key-words. This initially resulted into the following key-words: strategy testing, strategy validation, ex ante strategy validation, and stress-testing. Secondly, these key-words were used for key-word analyses and refined the searching criteria for the online data-bases. Since the inclusion of strategy resulted in an overwhelming amount of results, two actions were taken. The first action was a refinement of the search filters by searching on the exact phrases. This reduced the amount of searching results substantially. The second refinement was made by searching on title. As a result of these refinements, the amount of search results had significantly reduced. This allowed for analyses of the abstracts in order to identify relevant papers. As a result, additional key-words were identified, i.e. Business Wargames, Lean Startup, Agile, and Scrum. The process of analysing the abstracts was repeated for these additional key-words.

Collection phase

The relevant papers which were identified from the key-word and abstract analyses, where collected, categorized on topic, placed in a literature chart, and ranked on their amount of references by other researchers. This reference-analysis was conducted by usage of Google Scholar.

Reviewing phase

Unfortunately, no review paper on strategy testing was found during the orientation and collection phase. For this reason, the literature chart served as a guide for the actual literature review. To guide this process, the following criteria were set. Firstly, the order of reading the papers was based on their ranks in the literature chart. Secondly, papers from the year 2000 or later were favoured. Thirdly, journal paper were selected. The papers were reviewed and short summaries were made. Moreover, those papers which were assessed as valuable were used as sources of references to other papers by using their reference lists. By means of this 'snowball effect', the base of literature expanded and eventually led to an additional strategy testing approach, i.e. Pre-mortem analysis.

Processing phase

As a result of the aforementioned literature review process, the results were translated into the literature review which will be discussed in the next section of this research paper, i.e. section 2.3— strategy testing approaches.

2.3 Strategy testing approaches

The following sections provide an in-depth discussion about the five strategy testing approaches which were selected for this research study; 1) checklist assessment, 2) Pre-mortem analysis, 3) interactive simulations, 4) Scrum, and 5) hypothesis-driven experimentation.

2.3.1 Checklist assessment

Strategists are confronted with complex business dilemmas created by their unique business environment. For this reason, Simons (2010a) expresses his scepticism about one-size-fits-all solutions by arguing that the only approach to add value to all businesses is by asking the right questions. By probing tough questions, strategists can unveil ambiguity, inefficiencies or shortcomings in their strategies (Simons, 2010b). The usage of checklists can guide strategic decision-makers in a more systematic way through sets of questions categorized for different elements of a strategy. Kraaijenbrink (2015) for example, has included strategy assessment due checklists into his strategy generation process for "judging and testing the quality of the organization's strategy against relevant criteria" (p. 113). He reasons that checklists can be used for assessing an organization's current strategies as well as newly generated strategies before execution has started. By means of assessing whether a strategy holds itself again tough self-assessment questions, an activity also referred to as 'stress-testing', strategic decision-makers can test the strategy's quality early on (Bradley et al., 2011). For this reason, checklist assessment has been included within this research study with the premise of testing whether a strategy holds against (basic) criteria prior to its implementation. For the purpose of this research paper, strategy checklist assessment is defined as "subjecting an intended or current strategy to a subset of questions which are incorporated into a checklist to systematically assess the strategy's quality against relevant criteria". The next paragraph will discuss criteria which can be incorporated into a checklist assessment for strategy testing.

Checklists

The four checklists which will be discussed in this paragraph all serve the purpose of strategy testing, although their focus areas differ. Bradley et al. (2011) have composed a list of ten general tests which address various topics that were acknowledge by senior executives as being part of the strategic dialogue within their organizations. These 'pressure tests' focus on the strategy as a whole and generate deeper strategic dialogues, which helps to unveil where the strategy needs additional work. The second checklist assessment is provided by Simons (2010a,b), who has translated a stress-test into seven questions which can be used to assess whether the strategy is ready for implementation. These questions focus on determination of strict priorities, designating key performance indicators (KPIs), techniques to enhance creative tension and commitment, and the ability to adapt the strategy overtime (Simons, 2010a,b). Next, Kraaijenbrink (2015) offers a more comprehensive list of nine strategy checks, each addressing specific criteria to assess a strategy on. Six checks contain subsets of questions which are sub-categorized for all of the ten elements of Kraaijenbrink's (2015) strategy sketch; resources & competencies, partners, customers & needs, competitors, value proposition, revenue model, risks & costs, values & goals, organizational climate, and trends & uncertainties. The remaining three checks provided by Kraaijenbrink (2015) focus on the strategy as a whole. The final checklists this paper discusses are provided by Kahneman et al. (2011), and focus on assessing whether (strategic) decisions are effected by biases. Elaborating on a McKinsey study by Lovallo and Sibony (2010), that reports empirical evidence of higher returns as a result of reducing the effect of biases in the decision-making processes, Kahneman et al. (2010) developed twelve checks, each addressing certain biases. All of the checklists can be used to systematically test whether the strategy meets the criteria, and which elements of the strategy require adjustments or additional work. Table 1 gives an overview of all four strategy checklist assessments and the specific focus areas they are addressing. The next paragraph discusses the purpose of conducting strategy checklist assessments.

	BRADLEY ET AL. (2011)	KAHNEMAN ET A. (2011)	KRAAIJENBRINK (2015)	SIMONS (2010A,B)
BY MEANS OF:	Ten general tests which are acknowledged by CEOs as being part of the dialogue within their organizations.	Twelve checklist to assesses whether the initiative—plan—is prone to decision-making biases.	Nine strategy checks, each addressing specific criteria to assess a strategy's quality on	Seven questions to stress-test whether the strategy is ready for implementation.
CHECKS & TESTS:	T1: will the strategy beat the market? Emphasis on being different, or just playing along?	C1: self-interest of (individual) decision-makers?	C1: coherence; is there coherence between the different elements of the strategy sketch?	Q1: is the primary customer defined? Are all efforts maximized to generate value for the primary customer?
	T2: sources of competitive advantage; positional advantage & scarcity of capabilities.	C2: affect heuristic; is there an exaggeration of the benefits of a certain proposal?	C 2: efficiency; will each of the ten elements be employed to their full potential? Are areas for improvement identified?	Q2: is there a clear prioritization of whose interests are core valued— customers, employees, shareholders, others?
	T3: clarity about where to compete; market-segment	C3: group-thinking; were dissenting opinions take into consideration, or limited?	C3: effectiveness; are criteria in place for measuring the strategy's effectiveness against a predetermined benchmark?	Q3: are critical performance indicators in place to monitor and control progress during implementation? Do these indicators actually measure what is crucial for the strategy to meet its intended goal?
	T4: will the strategy put the organization ahead of trends, or merely elaborating on the status quo?	C4: saliency bias; are decisions based on heroic analogies?	C4: flexibility; is the strategy capable of matching the complexity and dynamics of the organization's industry?	Q4: is there a clear scope? Are boundaries set for the strategic initiative(s) in order to avoid strategy implementers get side-tracked?
	T5: is the strategy based on privileged—not easy available or proprietary—insights, which competitors don't have access to?	C5: conformation bias; is evidence exclusively gathered for one solution instead of considering credible alternatives?	C5: robustness; will the strategy remains its stability when it is subjected to changes within its elements?	Q5: are there mechanisms in place to foster creative tensions among employees?
	T6: has uncertainty been taken into consideration and is the strategy gardened against uncertain events?	C6: availability bias; is the decision based on the evidence or information that was currently available rather than seeking for new information—data?	C6: scalable for growth purposes or for achieving the same revenue with less effort?	Q6: is there a culture in place to support the strategic initiative(s)?
	T7: is the balance between flexibility and commitment in line with the business environment?	C7: anchoring bias; where the numbers are based on guesses, extrapolations of historical trends or deliberate manipulation	C7: uniqueness; can the strategy generate sustainable value creation due the source, degree and sustainability of its uniqueness?	Q7: are there systems, mechanisms or plans in place to cope with (hypothetical) uncertainties

T8: is the strategy influenced by biases of decision-makers?	C8: halo effect; are only certain aspects of stories of others used to support the plan, or were multiple examples taken into consideration which are comparable with the own business context?	C8: responsibility; is responsibility taken for the interests of other parties such as shareholder and stakeholders?
T9: is there support within the organization for the strategy?	C 9: sunk-cost fallacy; are (individual) decision-makers attached to the plan, due efforts of the past?	C9: pros and cons; is a systematically recapitulation of the previous discussed checks performed?
T10: is the strategy translated into clear, unambiguous objectives and actions?	C10: optimistic bias; is there overconfidence in the strategic plan?	
	C11: disaster-neglection; is the occurrence and impact of potential future events taking into consideration? C12: loss-aversion; is there existence of extreme conservatism that might	
	hinder fully exploitation of the plan's potential?	

Table 1: checklists for strategy testing

Purpose

Strategy checklists serve the overall purpose to assess a current or new strategy against critical criteria (Kraaijenbrink, 2015) and to (quickly) identify ambiguity, inefficiencies or shortcomings in the strategy (Simons, 2010b). Based on the information and learnings from a checklist assessment, strategist can prioritize on which areas to focus on (Bradley et al., 2011; Kraaijenbrink, 2015). Furthermore, checklists can function as a catalyst for stimulating engagement of participant in the decision-making process (Simons, 2010a,b). In addition, performing a checklist assessment and react upon it can be used as a vehicle to increase confidence in the strategic plan (Simons, 2010b). Finally, checklist assessments can be used as a tool to improve the strategy-development process itself (Bradley et al., 2011).

Advantages & Disadvantages

The primary advantage of using an assessment checklist lies in its usability for all businesses (Simons, 2010a), although not all items within a checklist might apply to a specific organization. Moreover, checklists can be used to test a strategy prior to its implementation. It can provide detailed insights into the quality of a strategy and its likeliness to succeed (Kraaijenbrink, 2015). Notwithstanding, this approach for strategy assessment—or testing—has its limitations as well. Kahneman et al. (2011) argue that checklists are prone to be used partially or selectively, while the benefits from checklist assessments can only be achieved by going through them completely. However, this argument is partially weakened by Kraaijenbrink (2015) who reasons that even performing a couple of test—which are most critical to an organizations specific business complexity—can contribute to (quickly) assess whether the strategy meets basic criteria. Nevertheless, the underlying message is that checklists should not be used merely as a check-or-no-check exercise without thorough assessment. Finally, Gary Klein argues in a McKinsey (2010) interview that checklists are only useful for high-validity environments, rather than complex environments, because the later requires a higher level of judgement. He proposes an alternative approach for assessing an intended plan which is discussed in the next section of this paper, i.e. a Pre-mortem analysis.

ADVANTAGES CHECKLIST ASSESSMENT	AUTHOR(S)	DISADVANTAGES CHECKLIST ASSESSMENT	AUTHOR(S)
Usability for all businesses	Simons, 2010a	It is prone to be used partially or selectively	Kahneman et al., 2011
Can provide detailed insights into the quality of the strategy	Kraaijenbrink, 2015	It requires discipline to go through all relevant checks	Kahneman et al., 2011
Assess the strategy's elements through different lenses— perspectives	Bradley & Matson, 2011	Going through a complete set of checklists requires much effort in information gathering and analyses	Kraaijenbrink, 2015
Can highlight the areas for improvement	Kraaijenbrink, 2015; Simmons, 2010b	In order to make a checklist assessment meaningful, a clear distinction should be made between the decision-makers and those performing the assessment	Kahneman et al., 2011
Can be used as a tool for a more systematic strategy assessment	Kraaijenbrink, 2015	It requires a culture and mind-set within the organization for open debate and where critical judgement is encouraged	Kahneman et al., 2011
Enforce engagement	Simons 2010a,b	Checklists are only useful for high- validity environments, rather than complex environments	McKinsey (2010)
Tackles (individuals) biases	Kahneman et al., 2011		
Better chance of developing a market-beating strategy	Bradley & Matson, 2011		

Table 2: advantages and disadvantages of checklist assessments

2.3.2 Pre-mortem analysis

As illustrated by Wheelen and Huger (2012), strategy evaluation often forms a subsequent phase in the strategic management process after strategy implementation. This after-the-fact rationalization, strategic hindsight, aims to enhance organizational learning by seeking for explanations from both failure and success (McKenna, 2011; Mitchell et al., 1989). However, this implies that an event first has to occur—or partially occur—, which might obsolete the process of evaluation when an organization has faced a catastrophic downturn. In contrast to a post-mortem learning-session where an event already occurred, Gary Klein (2007) introduced the pre-mortem technique which comes at the beginning of a project or initiative and makes the premise that an event already occurred and failed. The pre-mortem technique is based on the principle of prospective hindsight, i.e. explaining future events as past (Mitchell et al., 1989). This theory argues that the decision-making of participants concerning future events will improve whenever decisions are reflected (Gross, 2014). Indeed, Mitchell et al (1989) found evidence that providing information about the outcome of an event, leads to a higher degree of correct reasons for this outcome by their research participants. In contrast to foresight which is drowned in uncertainty about the eventual outcome of an event, prospective hindsight artificially removes this uncertainty, making it a more effective approach to reason about the future (Gross, 2014). As emphasized by Klein in a McKinsey (2010) interview, "the pre-mortem technique is a sneaky way to get people to do contrarian, devil's advocate thinking without encountering resistance" (p. 5). For this reason, it enforces participants to consider the initiative from another perspective and actively seek for flaws in the intended plan, rather than seeking for conformation (Serrat, 2012). By means of assuming that a plan has failed, it frees participants from being reserved and invites them to challenge the intended plan (Klein, 2007) and identifying potential impediments (McKenna, 2011). This approach is different from scenario planning which focuses on imagining how the future might evolve, by seeking for reasons why a future plan might has failed (Veinott et al., 2010). The team, guided by a facilitator, brainstorms about all the reasons that could have led to failure and develops actions to pro-actively mitigate these failures and strengthen the initial plan (Klein, 2007). The process how a pre-mortem analysis work towards this goal is described in the following paragraph of this section.

Process

In its essence, the pre-mortem technique is a brainstorm session consisting of a five-step process (Klein, 2007; Veinott et al., 2010): 1) preparation, 2) declaring the failure of a plan, 3) elicit reasons for failure, 4) prioritize the list of reasons, 5) revisit and strengthen the initial plan. Firstly, the facilitator must arrange a face-to-face, time-boxed session which can be attended by all key participants with a stake in the problem (Gross, 2014). During the kick-off, the facilitator starts with a recap of the initial plan and continues with the announcement that the plan has failed for currently unknown reasons (Klein, 2007). During the third phase, each team members writes down all the reasons for the possible failure of the plan within a short time period (Klein, 2007; McKenna, 2011; Veinott et al., 2010). The logic to perform this exercise individually is to avoid team members influencing each other and because each of the members have their own experiences, mental models and perceptions. Consequently, during several rounds, each team member reveals one reason at a time until all reasons are gathered (Klein, 2007; Serrat, 2012; Veinott et al., 2010). Next, all the items are reviewed and collectively prioritized concerning their perceived impact or probability (Armbruster et al., 2014; Serrat, 2012; Veinott et al., 2010). During the final phase, the team elaborates on the top three items on the collectively established list and brainstorms how to proactively mitigate or eliminate these potential failure reasons (McKenna, 2011; Serrat, 2012; Veinott et al., 2010). Based on the collective knowledge, the facilitator incorporates the mitigation activities in a project action plan (Gross, 2014). This process can be repeated periodically to completely exhaust all items on the list and strengthen the plan in its early stage.

Purpose

The main purpose of conducting a pre-mortem analysis is to identify potential flaws or vulnerabilities in an intended plan before implementation (Armbruster et al., 2014; McKenna, 2011; Sullivan et al., 2008). The logic behind this methodology accompanies the dilemma this research paper addresses, i.e. testing a strategic initiative before implementation. By adapting this approach, managers are provided with the opportunity to pro-actively prevent, mitigate, or correct shortcoming in the plan and enhancing the probability for success (McKenna, 2011; Sullivan et al., 2008). In addition, a pre-mortem analysis can heighten the sensitivity on certain areas and enforcing extra attention on these areas (Gross, 2014; Klein, 2007; McKenna, 2011). Furthermore, by including multiples participants, the pre-mortem technique challenges individual conformation biases and encourage participants to abandon reservation and speak freely (Klein, 2007). The remaining of this section will summarize the advantages and disadvantages of performing a pre-mortem analysis.

Advantages & disadvantages

The main benefit of conducting a pre-mortem analysis lies in the identification of potential shortcomings of the intended plan, which otherwise might have been revealed in a later stage (Klein, 2007; McKenna, 2011; Serrat, 2012). By combining individual reasoning and collective brainstorming, the technique can overcome group thinking (Gross, 2014), cognitive biases by individuals (Serrat, 2012), and conformation biases (Gross, 2014; Serrat, 2012). Although the literature is very limited on addressing the disadvantages of performing a pre-mortem analysis, the following shortcomings can be argued. There is a significant need for an objective facilitator (Klein, 2007) to avoid the pre-mortem session becomes victim of being a battlefield where team members primarily criticise each other or get side-tracked from the initial purpose of the session. In the quarterly interview held by McKinsey (2010), Gary Klein argues that a pre-mortem won't result in abandoning an initial plan, but rather adjusting it. One might argue that performing a pre-mortem analysis solely for adjusting an initial plan might result in strengthening a plan which itself is subordinated compared to alternatives. Furthermore, since a pre-mortem is a periodic event at most, its lessons might be forgotten soon. Finally, the knowledge from a pre-mortem analysis relies on assumption instead of empirical evidence. The same counts for research studies which lack empirical evidence, questioning the proposed advantages of this technique in practical settings. Table 3 gives an overview of the advantages and disadvantages of conducting a Pre-mortem analysis.

ADVANGTAGES PRE-MORTEM ANALYSIS	AUTHOR(S)	DISADVANTAGES	AUTHOR(S)
Identification of potential shortcomings	Klein, 2007;	A pre-mortem won't result in	McKinsey,
of the intended plan, which otherwise	McKenna, 2011;	abandoning an initial plan, but	2010
might have been revealed in a later stage	Serrat, 2012	rather adjusting it	
Reducing the tendency for conformation	Gross, 2014,	There is a significant need for	Klein, 2007
bias and consider alternatives	Serrat, 2012	an objective facilitator	
Can overcome cognitive biases from	Serrat, 2012		
individuals with a significant stake in the			
development of the initiative			
Team members can challenge the	Klein, 2007;		
intended plan, rather than being reserved	Serrat, 2012;		
for the fear of opposing their executive	Veinott et al.,		
	2010		
Can overcome 'group thinking'	Gross, 2014		
Reducing overconfidence of individuals in	Veinott et al.,		
the intended initiative	2010		
Can guide the team to pay extra focus on	Klein, 2007;		
certain areas	McKenna, 2011		
Conducting a pre-mortem analysis is	Serrat, 2012		
relatively easy and low in costs			

Table 3: advantages and disadvantages of pre-mortem analyses

2.3.3 Interactive simulations: Business Wargames

"For centuries, the military-including its most famous leaders-have used the wargaming process to prepare for battle" (Frost et al., 2012, p. 86). By the end of the 18th century, dr. C. L. Helwig developed a game that introduced three principles which are still considered of vital importance to today's wargame simulations, i.e. game elements representing contingent instead of individual forces, multiple terrains, and a referee to run and control the game (Oriesek & Schwarz, 2008). McCarty Little, member of the US's Naval War College which was founded in 1884, introduced the concept of twosided wargaming, i.e. a focus on one's own and one's adversaries deliberating process (Brightman & Dewey, 2014). Rather than adapting the notion of reductionism by viewing a system or problem as a dissociated collection of individual parts, McCarty took a holistic view and considered the pieces as a whole system-a view which is argued to be the foundation of modern wargaming (Brightman & Dewey, 2014). Moreover, McCarty argued that the value of wargaming lies neither in its ability to predict or generate tangible outcomes, but rather lies in the dialogue that occurs within the wargaming process itself (Brightman & Dewey, 2014). "The application of wargaming in a business context, also called business wargaming is, in comparison to the overall evolution of the methodology, a recent development [...]" (Oriesek & Schwarz, 2008, p. 6). Nowadays, a wargame is increasingly perceived as a useful process for gaining competitive actionable intelligence and decision-support by testing predetermined plans (Kurtz, 2003). There are important differences between educational business games-instructional games-, (computer) simulations, and business wargames used as practical assistance for strategic dilemmas.

Educational business games are often referred to as 'total (business) enterprise simulations', a term for "a descriptive and mathematical model of the general activities associated with operating a company in its totality" (Goosen et al., 2001, p. 23). These games, focusing on contingencies of multiple enterprise disciplines, predominantly ought to train players in business skills and evaluate players performances, e.g. the Business Strategy Game where (small) groups of students run a simulated company and individually are assigned to play the role of different departmental managers (Doyle & Brown, 2000; Greco et al., 2013). Furthermore, there are functional simulation games which emphasis on one particular organizational discipline such as marketing or production, and concept simulation games, which further narrow their orientation within a certain organizational discipline, e.g. online brand marketing (Faria et al., 2009). Thus, business wargames differ from educational business simulation games by assisting in knowledge acquisition and accumulation rather than transferring knowledge. In addition to the distinction between educational business games and wargames, the second issue that needs clarification is the relation of wargames and simulations. "Since its introduction in academia and professional practice during the 1950s, gaming have been linked to simulation. Although, both fields have a few important characteristics in common, they are distinct in their form and underlying theories of knowledge and methodology" (Klabbers, 2009, p. 446). Rubel (2006) stresses that the difference between computer simulations and wargames lies in the usage of a computer model, where wargames require human players who may use a computer model to assist them. Thus, a wargames may be assisted by a computer model, rather than driven by a model such as simulations are (Schwarz, 2011). Moreover, Klabbers (2009) argues that gaming has much more potential in dealing with social and political issues because computer simulations are closedfunctionalistic-models representing a formal approach with a focus on the rules and resources domains where the user is operating outside the model as a spectator, whereas a wargame is an artificial representation-simulation-using an open-interactive-model where actors form a basic component of the model, thus adding the domain of social actors and human intervention (Klabbers, 2009; Rubel, 2006). Finally, simulations can run up to thousands of simulation runs, whereas wargames are limited to about 10 to 40 cycle runs since the inclusion of actors in the model makes more cycle runs too time consuming (Meadows, 2001). For this research paper, the view of Frost et al. (2012), Kurz (2003), Oriesek & Schwarz (2008), and Schwarz (2011, 2013) is followed by perceiving a wargame as a tailor-made, dynamic, strategic-simulation.

There is no universally accepted definition of wargames. Kurtz (2003) considers wargames from a strategic management perspective and defined a wargame as "a role-playing simulation of a dynamic business situation" (p. 13). This paper adapts a more comprehensive definition in the context of strategic management given by Frost et al. (2012) who formulated a wargame as a "set of principal actors (i.e. participants representing equities or interests) who take actions to achieve goals, subject to constraints on resources, with 'creative' tension among the actors (competitive or otherwise divergent stakeholder interests) and a resolution (or at least an attempt at one) and metrics to assess impact and success" (p. 87). From now on, wargaming in this research study exclusively refers to wargames in business–strategic management–context, thus calling it a business wargame (BW).

Now the great secret of its power lies in the existence of the enemy, a live, vigorous enemy in the next room waiting feverishly to take advantage of any of our mistakes, ever ready to puncture any visionary scheme, to haul us down to earth—McCarthy Little (1887)

Process

In a BW, managers are grouped into teams that are assigned to represent a certain entity with a stake in the business dilemma the organization is facing (Kurtz, 2003). "Any business wargame contains at least four elements: the company team, the competitor teams, the market team and the control team" (Oriesek & Schwarz, 2008, p. 23). The BW usually consists of several 'rounds'-decision cycles-that represent different time periods, illustrating possible evolvements of decisions and consequences which might occur (Kurtz, 2003). The game starts with a prepared business condition based on current available data which mimics the current business conditions. From that moment on, teams are allowed to make any decisions within the boundaries of predetermined rules for the wargame, i.e. anything that can happen in the real-world including competitive offerings, investments, deregulations & regulations, mergers & acquisitions, alliances and natural disasters (Schwarz 2009, 2011, 2013; Treat et al., 1996). The 'company team' represents the home company and starts by executing its current strategy or test alternative strategies with the aim to test the feasibility of the strategic plans (Oriesek & Schwarz, 2008). The 'competitors teams' are assigned to represent the most significant competitors and might introduce a so-called 'wild card' which represents a fictional competitor that currently does not participate in the market but could enter in the future and disrupt the market (Chussil, 2007; Kurtz, 2003). The managers representing these teams have to go beyond the mindset of seeing the world from the competitors' perspective by walking in their competitors' shoes and constrain their actions and tactics based on the competitors resources and abilities (Chussil, 2007). Moreover, they have to switch their mindset to see the 'company team' as their rival, rather than seeing them as their own company's representatives (Chussil, 2007). The 'market team', consisting of internal or external market experts, represents the end-user market and possibly the channels employed to reach these markets (Kurtz, 2003; Oriesek & Schwarz, 2008). This team values the decisions made by the teams and their consequences on key performance indicators such as customer reactions, market size, market shares and revenues (Kurtz, 2003; Oriesek & Schwarz, 2008; Schwarz 2009, 2011, 2013). Finally, after receiving the outlines of the strategic plans, the actions of each team, and the review of these teams' moves by the market team, the 'control team' prepares a debriefing moment after each round (Kurtz, 2003; Schwarz, 2009, 2011, 2013). During this debriefing intervention, the control team presents all the data and figures such as (financial) ratios and prognoses about market shares, to each team as input for the next round. Although performed in the context of student learning, van der Meij et al. (2013) found empirical support that debriefing significantly improves performance during consequent rounds due learning effects of the debriefing intervention. Especially during the final debriefing, the aim is to translate the experiences learned from the game into the real-life business dilemma (Peters & Vissers, 2004) and facilitate understanding of business dynamics (Lederman, 1992). Additional responsibilities of the control team are: communicating with the wargame (model) developer, supervising the wargame, enforcing the rules of the wargame, assess the feasibility of the suggested strategic plans, resolving disputes among teams, introducing more dynamism due discontinuities or 'shocks', documenting the findings and other remarks in a final (management) report, and optionally representing the role of other stakeholders (Kurt, 2003; Oriesek & Schwarz, 2008; Schwarz, 2009, 2011, 2013). BWs usually consist of several rounds and take several days, although it is worth noting that playing the wargame represents approximately 10 to 15 percent of the total effort involved in conducting a wargame (Kurtz, 2003; Treat et al., 1996). Kurtz (2003) broadly illustrates that the total process of conducting a BW contains of the following steps: scope definition, design meeting with wargame designer, preparing individuals with the materials to perform their assigned roles, prewargame briefing as kick-off and instructions moment, team preparations to assist individuals to get into their roles, the actual wargame, post-wargame documentation to create a management report, final debriefing of the results, and planning the strategic plans that need to be implemented. The total BW project can range from a few weeks up to months, depending for example on the complexity of the business dilemma, the organizations' prior wargame experience, and the accessibility of the required information and data (Kurtz, 2003).

Purpose

Nowadays, one of the main purposes, as not the predominant purpose, of a BW is strategy testing (Ginter & Rucks, 1984; Minis & Tsamboulas, 2008; Schwarz, 2009, 2011). The role-playing nature of BWs allow participants to discover the holes in their organizations' strategic plans (Chussil, 2007) and the consequences of their strategic initiatives (Schwarz, 2009, 2011). Furthermore, BW are argued by Treat et al. (1996) to contemplate Mintzberg's (1994) critics about the traditional planning within the strategy formulation process, i.e. the lack of discontinuities and a focus on analysis rather than synthesis. In addition, BW can also address the critic made by Orsiek and Schwarz (2008) that "scenarios can be nothing more than rational and safe extensions of the past and often classify likely outcomes along simple linear views of reality, whereas the real world involves complexity and multiple dimensions" (p. 33). Schoemaker (1992) states that building future images based on identifying existing trends and key uncertainties is the basic idea of scenario analysis, which therefore is also criticized by Treat et al. (1996) since future projections based on historical analysis can dangerously play into managers own set of biases. To overcome these critics, Schwarz (2009) argues that BW can be a vehicle to develop foresights as a result of interacting participants testing and answering 'whatif' scenarios and incorporating future dynamics of markets. The overall idea of foresight, is to prepare for possible or imaginable situations and allows the organization to anticipate on them by developing predetermined strategic plans, rather than making quick responsive decisions under high pressure due the surprise of such events (Mendonça et al., 2004). Next, a BW can enhance a deeper understanding of the business dynamic the organization is facing due an extensive focus on eternal forces, allowing the organization to identify critical success factors and (possible) drivers of market evolutions (Frost et al., 2012; Kurtz, 1996; Menon, 2012). Furthermore, BWs can be used to create 'memories of the future', seeing the big picture, share intelligence, and get more confidence to make judgement calls, which are four elements stressed by Wenzler and Chartier (1999) for effective organizational learning. As argued by Fanning and Gaba (2007), adults-thus including those predominantly participating in BWs-"learn best when they are actively engaged in the process, participate, play a role, and experience, [...], the learners must make sense of the events experienced in terms of their own world" (p. 115). This learning by doing and assimilation of everyday lessons into human behaviour is called experimental learning (Fanning & Gaba, 2007). In addition, a BW can create a buy-in effect for the chosen strategic initiatives, thereby requiring less persuasion since all participants have experienced, seen, and understand the logical of the strategic decision (Frost et al., 1996). Thus, BW can be valuable in the strategic decision-support (Chussil, 2007; Ginter & Rucks, 1984; Kurtz, 2003). Finally, BW might also help to bridge the formulation to implementation gab since it offers lessons and guidance for the real-life situation (Treat et al., 1996). Overall, BW can serve multiple-often overlapping-purposes contributing to strategy development and might even be seen as another way of sustained competitive advantage itself. The next paragraph discusses the advantages and disadvantages of BWs.

Advantages & Disadvantages

A key benefit of performing a BW is the ability to test (hypothetical) strategic plans within a safe environment without experiencing the real-life consequences of failures (Frost el al., 2012; Oriesek & Schwarz, 2008; Reibstein & Chussil, 1999; Schwarz, 2011; Treat et al., 1996). Indeed, BWs allow executives to assess the feasibility of their organizations' strategic initiatives before committing any resources to the actual implementation of those plans, thus minimizing the costs of failure in real-life settings (Reibstein & Chussil, 1999; Oriesek & Schwarz, 2008). Furthermore, BWs take a holistic view (Brightman & Dewy, 2014; Frost et al., 2012) including both internal and external forces that should contribute to a deeper understanding of the business dynamics the organization is facing (Kurtz, 2003; Rubel, 2006; Schwarz, 2011; Wenzler & Chartier, 1999), thus resulting in a coherence strategy. However, as discussed by Rubel (2006), BWs are criticized for the value of the epistemological knowledge it generates, i.e. knowledge generated by BWs is neither predictive nor can be used to proof anything. BWs deal with constructive narratives which are stories created due actions, assumptions and decisions made by participants (Menon, 2012). As a result, BWs will always be prone to subjective human judgement and perceptions. However, Brightman and Dewey (2012), Chussil (2007), and Menon (2012) weakens this disadvantage of BWs by reasoning that BWs are useful to raise questions, to challenge the status quo, and to help managers anticipating on changing business dynamics. In addition to aforementioned critics, Rubel (2006) stresses that BWs are not real which might result in players behaving differently-more aggressively- since no real-life consequences are at stake (Rubel, 2006). Finally, conducting a BW requires resources such as data, executives time, and finance (Kurtz, 2003). Table 4 gives an overview of the advantages and disadvantages of BWs.

ADVANTAGES BWS	AUTHOR(S)	DISADVANTAGES BWS	AUTHOR(S)
Testing of (hypothetical) strategic plans within a	Frost el al., 2012; Oriesek & Schwarz, 2008; Reibstein	Knowledge generated from BWs is neither	Menon, 2012;
safe environment	& Chussil, 1999; Schwarz, 2011; Treat et al., 1996	predictive nor it can proof anything	Rubel, 2006
Identification of possible consequences of a	Chussil, 2007; Reibstein & Chussil, 1999; Schwarz,	Knowledge is conditional and only	Rubel, 2006
strategic initiative	2011	indicative	
Uncover potential holes and/or weaknesses in the	Chussil, 2007; Kurtz, 2003; Schwarz, 2009, 2011	Decision support mechanisms, rather than	Ginter &
strategic plan		automatic decision-making systems itself	Rucks, 1984
Participants life through the experience and view	Chussil, 2007; Frost et al., 2012; Kurtz, 2003; Oriesek &	It is not real, therefore participants might	Rubel, 2006
the business dilemma from multiple perspectives	Schwarz, 2008; Schwarz, 2009,2011; Treat et al., 1996	behave differently	
Taking a holistic view	Brightman & Dewy, 2014; Frost et al., 2012	It is not precise	Chussil, 2007
A deeper understanding of the business dynamics	Frost et al., 2012; Kurtz, 2003; Menon, 2014; Rubel,	Subjective human judgement; constructive	Menon, 2012
the organization is facing by including both	2006; Schwarz, 2011; Wenzler & Chartier, 1999	narratives which are stories create by	
internal and external forces		actions, assumptions and decisions of	
		participants	
Suitable to deal with complex situation ; robust	Oriesek & Schwarz, 2008; Rubel, 2006	Requires resources such as data,	Kurtz, 2003
enough to deal with poorly structured business		executives time, and finance	
dilemmas			
Develop strategic foresight by including 'what-if	Schwarz, 2009	Cycle runs are limited to about 10 to 40,	Meadows,
scenarios' and explore weak signals		since the inclusion of actors in the model	2001
		makes more cycle runs to time consuming	
Future-oriented and introduce discontinuities	Oriesek & Schwarz, 2008; Schwarz, 2009, 2011		
Enhance organizational learning; steeper learning	Wenzler & Chartier, 1999		
curve of 'valley of despair'			
Raise critical questions and challenge the status	Brightman & Dewey, 2012; Chussil, 2007; Menon,		
quo	2012		
Shared ownership of strategy initiatives	Frost et al., 2012		
Reducing individual confirmation biases, because	Chussil, 2007		
decisions are based on consensus of a full set of			
(senior) executives or/and external experts.			
Facilitates communication and a shared	Frost et al., 1996; Wenzler & Chartier, 1999		
understanding among (internal) participants			
Create buy-in of participants for the strategic	Frost et al., 1996		
initiative			
Minimizing the costs of failure in real-life settings	Reibstein & Chussil, 1999; Oriesek & Schwarz, 2008		
Decision-support	Chussil, 2007; Ginter & Rucks, 1984; Kurtz, 2003		

Table 4: advantages and disadvantages of BWs

2.3.4 Scrum

Todays complex and continuously changing business environments enforcing organizations to operate differently. This is especially true for software-oriented organizations that are confronted with changes in technology (Dybå, 2000), changing product requirements (Paasivaara & Lassenius, 2006; Rising & Janoff, 2000), and fierce competition (Takeuchi & Nonaka, 1986). In order to cope with business complexity, a stream of research is rooted in the rationalistic paradigm and emphasis on standardized, controllable, and predictive processes (Dybå, 2000). The traditional deterministic approach based on detailed plans (Schwaber, 2004), linear workflow (Dybå, 2000), and up-front development (Blank, 2013b) is argued for being too rigor for fast-changing business environments. Furthermore, this approach is based on the implicit assumption that customer requirements are known and understood (Blank, 2013a), while in practice (product) requirements often are not known upfront (Paasivaara & Lassenius, 2006; Paasivaara et al., 2009; Rising & Janoff, 2000). Takeuchi and Nonaka (1986) argue that the sequential approach don't work in rapidly changing business environments and call for a holistic approach with an emphasis on speed, flexibility, small self-organizing project teams, and learning. In addition, agile methodologies assist organizations to rapidly respond to changing environments (Agarwal et al., 2006; Vlaanderen et al., 2011) since they enhance an organization's capability for rapid reconfiguration (Bassant et al., 2002). Within the base of agile methods, only Scrum provides a framework within one can employ various processes, whereas other agile methods such as Extreme Programming, Agile modelling, and Pragmatic programming, focus on activities or practices (Pino et al., 2010). For this reason, only the Scrum agile methodology is discussed in this section. Ken Schwaber and Jeff Sutherland developed the Scrum process by combining the iterative and incremental nature of agile principles with the practice of working in small self-organizing project teams (Schwaber, 2004; Schwaber & Sutherland, 2013). Scrum takes an essentially different approach than methodologies incorporated in the rationalistic paradigm school of thought by assuming that the chaotic nature of business environments makes detailed planning and offsetting business uncertainties impossible (Beedle et al., 1999; Fitzgerald et al., 2006). It embraces the empiricism philosophy by making decisions based on knowledge from experience and incorporates the elements of transparency, inspection, and adaption in its framework (Schwaber & Sutherland, 2013). The Scrum framework is based on a few rules, such as working in small self-organizing teams, daily Scrum meetings, and 30-days iterative learning cycles; making the process steps visible (Schwaber, 2004) and frequent enough to try new, or adapt the initial process (Berczuk, 2007). The later justifies the place of Scrum in this research since this approach can be adapted for trying or testing strategic initiatives in this fashion. There are three important roles within the Scrum process (Schwaber, 2004, Schwaber & Sutherland, 2013): 1) the Product Owner who represents the interests of all stakeholders and managing the Product Backlog, 2) the Development Team that translates the defined acquirements into functionality, and 3) the Scrum Master who is responsible for the Scrum process itself. One of the core principles of Scrum is its focus on "delivering the highest priority business value as defined by the customer (Product Owner)" (Schwaber, 2004, p. 8), rather than delivering any business value. Furthermore, Schwaber (2004) argues that Scrum is highly suitable for organizations facing the dilemma of unknown, unknowable or changing requirements. Taking the previously characteristics of Scrum into consideration, this paper adapts the definition by Schwaber (2013) with Scrum as "a framework within which people can address complex adaptive problems, while productively and creatively delivering products of the highest possible value" (p. 3). The subsequent paragraph discusses the Scrum process.

Process

The Scrum method is essentially different from common approaches, such as the waterfall-approach with a strong emphasis on linear planning (Schwaber, 1997). As an agile practice, Scrum is based on the principles of iterative and incremental adjustments (Beedle et al., 1999) with minimum upfront defined processes or fully specified requirements (Beedle et al., 1999; Schwaber, 1997; Vlaanderen et al., 2011), i.e. solely a defined vision, soft requirements, and a desired end solution. The Scrum process can roughly be divided into the following six time-boxed steps (Schwaber, 1997; Schwaber &

Sutherland, 2013): 1) vision, 2) product backlog, 3) sprint planning, 4) sprints, 5) sprint review, and 6) sprint retrospective. Firstly, a Scrum project starts with a vision about the desirable product or system to be developed. In turn, this vision must be translated into a plan. The project owner is responsible for gathering and documenting a list with all requirements (Schwaber, 1997, 2004), functions (Schwaber & Sutherland, 2013), items (Jensen & Zilmer, 2003; Vlaanderen et al., 2011), and features (Schwaber & Sutherland, 2013) that must be included in the final solution. This document is called the 'product backlog' and contains of initially known requirements in the project's earliest stage and evolves during the project's life-time as a living artefact (Schwaber & Sutherland, 2013). Consequently, the product owner continuously (re)prioritize the most likely value creating items to organize the order in which the work has to be done (Jensen & Zilmer, 2003; Schwaber, 2004). In the third stage, the monthly eight-hour sprint planning, a set of the highest priority requirements—user stories (Scott et al., 2014)—from the product backlog is selected—with respect to available resources and time limit which has to be turned into a working increment (Schwaber, 2004; Schwaber & Sutherland, 2013). Subsequently, the selected set of requirements for the upcoming sprint is decomposed into smaller tasks—chunks (Jensen & Zilmer, 2003; Pope-Ruark, 2012)—and assessed for feasibility to complete them within a 30-day sprint event (Beedle et al., 1999;). These lower level tasks are documented in a 'sprint backlog', prioritized accordingly, and assigned to team-members (Beedle et al., 1999; Schwaber, 2004; Vlaanderen et al., 2011). This sprint backlog drives the teams activities (Rising & Janoff, 2000) in the following stage, i.e. the sprint. During a sprint, a Scrum term for iteration (Jensen & Zilmer, 2003), the cross-functional teams are responsible for "[...] figuring out how to turn a sprint backlog into an increment of functionality and managing their own work to do so" (Schwaber, 2004, p. 19). In general, a sprint is a 30-days' time-boxed event (Beedle et al., 1999; Schwaber, 2004) where no additional requirements can be introduced along those stated in the sprint backlog (Rising & Janoff, 2000; Vlaanderen et al., 2011), thus avoiding team members to get side-tracked from their activities. Since Scrum acknowledges the element of chaos and flaws of fixed planning, it guides and monitors each sprint by daily Scrums. Daily Scrums are short interventions—usually in the morning or at the end of a working day—where team-members share their progress and struggles by addressing the following three questions (Beedle et al., 1999; Pope-Ruark, 2012; Schwaber, 2004): 1) what has been done or completed?, 2) what impediments are experienced that hindered progress?, and 3) what will be done until the next daily scrum meeting? Furthermore, by using a 'burndown chart', the project's progress can be monitored by visualizing the work that has been completed and the amount of work that still needs to be done in respect to the remaining time horizon (Schwaber, 2004). The sixth step starts immediately when the sprint's time-frame has expired. During this sprint review meeting, the team presents its entire progress to the product owner by demonstrating a working increment. Based on feedback and information sharing, the product owner up-dates the product backlog and makes a reprioritization of what work needs to be done next. Accordingly, the team translates this next set of requirements in a new spring backlog which forms the new guidance for the next sprint event (Schwaber, 2004; Schwaber & Sutherland, 2013). In addition to the sprint review, the scrum-master holds a retrospective meeting and aims to evaluate the Scrum process itself and search for efficiency improvements for the next sprint (Schwaber, 2004; Schwaber & Sutherland, 2013). Depending on the project's size, this process repeats itself multiple times.

Purpose

Initially, Scrum was developed for managing complex projects in volatile business environments (Abrahamsson et al., 2003; Schwaber, 1997, 2004; Schwaber & Sutherland, 2013). It aims to compromise for traditional development processes by assuming the existence of up-front chaos and the impossibility to fully predict and control the development process (Beedle et al., 1999). Its framework forces both a proactive and reflective approach (Pope-Ruark, 2012) and is designed to quickly respond to changes, challenges, and new complexities during the process (Schwaber, 2004). Secondly, Scrum focuses on delivering the highest prioritized business value perceived and defined by customers within a series of time boxes—sprints (Beedle et al., 1999), rather than delivering any value

(Schwaber, 2004). Due short iterations and daily Scrums, the method tests whether value is created by an 'early and often' approach, i.e. proving complete business concepts (Schwaber, 2004). Thirdly, Scrum aims to make processes more transparent and manageable (Schwaber & Sutherland, 2013; Sutherland et al., 2007) by splitting-up the workload into smaller chunks (Pope-Ruark, 2012). Furthermore, it serves for controllability by activities aimed to identify deficiencies or impediments during the process (Abrahamsson et al., 2003). Fourthly, Scrum enhances self-managing of teams by moving central control and authority to the operational level where the actual work is done (Moe et al., 2010; Schwaber, 2004). In addition, Scrum enforces the individual and team's skills, capabilities, and creativity (Cockburn & Highsmith, 2001; Schwaber, 2004). Finally, Scrum aims to reduce the time between decision and feedback, i.e. shorten the feedback loops (Cockburn & Highsmith, 2001).

Advantages & Disadvantages

The prime advantage of Scrum lies in its ability to effectively manage unknown, unknowable, or changing requirements prior and during the process (Schwaber, 1997, 2004). It is an iterative, incremental, and adaptive framework which can be employed for various processes (Beedle et al., 1999). Moreover, Scrum starts to deliver in early stages and more important, gathers real customer feedback in its early stages (Rising & Janoff, 2000; Schwaber, 2014; Schwaber & Sutherland, 2013). It fosters organizational learning through short cycles of probe-and-learn efforts (Schwaber, 2004). However, it is worth noting that this methodology has some disadvantages as well. To start with its applicability outside its original context, i.e. managing software development projects. There is a lack of empirical evidence whether Scrum offers the same benefits in non-software context. In fact, in their review of empirical studies on agile methodologies, Dybå and Dingsøyr (2008) concluded that there is little scientific support for many claims, which supports the critique by Abrahamsson et al., (2003) who state that claims about the success of Scrum in practice often lack empirical evidence. Furthermore, the applicability of the framework in practical setting is argued to be difficult (Schwaber, 2004), since it requires trained team members (Paasivaara et al., 2009), a skilled Scrum master (Schwaber, 2004), a transition from individual towards self-managing teams (Moe et al., 2010), and discipline of the Product Owner to constantly up-date the product bachlog (Vlaanderen et al., 2011). Table 5 gives an overview of the advantages and disadvantages of Scrum.

ADVANTAGES SCRUM	AUTHOR(S)	DISADVANTAGES SCRUM	AUTHOR(S)
Ability to effectively manage unknown, unknowable, or changing requirements prior and during the process	Schwaber, 1997, 2004	A lack of empirical evidence whether it offers the same benefits outside its original context, i.e. managing software development projects	Abrahamsson et al., 2003; Dybå & Dingsøyr, 2008
An iterative, incremental, and adaptive framework which can be employed for various processes	Beedle et al., 1999	Scrum is a framework rather than a prescriptive process, making it hard to apply in practical setting	Schwaber, 2004
Suitable for dealing with larger, complex problems by breaking it down into a series of smaller manageable chunks	Rising & Janoff, 2000	Requires trained team members and a skilled Scrum-master	Paasivaara et al., 2009; Schwaber, 2004
Focus on highest priority requirements; guides a project systematically and incrementally towards its desired goal	Beedle et al., 1999	Requires a transition from individual towards self-managing teams; difficult for teams where team members demonstrate high levels of individual autonomy	Moe et al., 2010
Starts to deliver in early stages	Rising & Janoff, 2000; Schwaber, 2014; Schwaber & Sutherland, 2013	Alignment of strategic and iteration plans can be difficult	Moe et al., 2010
Avoid the team to get side-tracked	Fitzgerald et al., 2006	Performing both development and maintenance task	Moe et al., 2010
An empirical process which results in decisions made on knowledge from real-life experience	Schwaber, 2014; Schwaber & Sutherland, 2013	Determining the right allocation of resources can be difficult	Moe et al. <i>,</i> 2010
Enforces visibility and controllability due daily Scrums; avoiding missteps	Schwaber, 2004	It requires discipline of the Product Owner to continuously up-date the product backlog(s)	Vlaanderen et al., 2011
Reducing confusion about what activities need to be done due short time-boxed iterations	Mann & Maurer, 2005	It requires a clear, unified understand about when a increment is 'done'	Schwaber & Sutherland, 2013
Makes a distinction between those who are directly responsible for the project and those who are not	Schwaber, 2004	Requires a culture based on trust, shared mental models, and tolerance for learning from failure	Dybå, 2000; Moe et al., 2010
Reducing the amount of overtime	Mann & Maurer, 2005		
Work more effectively and efficiently by giving individuals and team members the authority to become self-organized	Schwaber & Sutherland, 2013		
Make quick adjustments	Schwaber &		
Cathers real customer data in early	Sutherland, 2013		
stages	Schwaber, 2004		
Decisions are made by the team, rather than individuals	Schwaber, 2004		
Daily Scrum meetings enhances	Beedle et al.,		
Internal communication and	1999; Rising &		
Fosters organizational learning through short cycles of probe-and- learn efforts	Schwaber, 2004		

Table 5: advantages and disadvantages of Scrum

2.3.5 Experimentation: Hypothesis-driven strategy testing

Taking previous section into retrospect, one might justly argue that simulations in essence can be considered as experiments. However, a distinction between simulations and experiments has been made in this paper to demarcate the unique territories of both testing methods and to eliminate confusion when discussing one or another. The rigorous distinction between an experiment and a simulation discussed in this paper, lies in the usage of a model to study the system under investigation. Simulations use computerized or reproduced models of a real or imagined system (Smith, 1999) and allow to perform experiments without interfering with real-life systems (Klabbers, 2009), thus conducting experiments on a model of a system (Mize and Cox, 1968). Experimentation in this section refers to conducting experiments with the real-life system itself. Taking interactive simulations— BWs—into consideration, Brightman and Dewey (2014) argue that BWs cannot be classified as experiments since "there is a continual cycle of influencing others and being influenced" (p. 28), although they certainly can be an essential precursor to the process of quantitative experimentation. Having clarified this presumably inconvenient terminology usages, the remaining of this section will explicitly elaborate on the Lean Start-up methodology, i.e. hypothesis-driven experimentation.

Steve Blank (2013a) claims to be one of the first authors to actually write on the thought that start-ups that do survive the first few though years take a more experimental and learning-oriented approach, rather than the traditional product-centric launch model approach. "According to the decades-old formula, you write a business plan, pitch it to investors, assemble a team, introduce a product, and start selling as hard as you can" (Blank, 2013b, p. 4). Indeed, many start-ups dedicate their time and resources primarily on the product and show their product to customers for the first time after finalization (Trimi & Berbegal-Mirabent, 2012). The Product Development (PD)-business concept, product development, test, and launch—approach suits organizations introducing a new product into an established and well understood market (Blank, 2013a). However, start-ups are all about unknowns (Blank & Dorf, 2012) and few even understand what their actual market is (Blank, 2013a). In addition, Blank (2013a) stresses the following shortfalls of the PD-approach: 1) it lacks customers and a proven financial model, 2) a focus on a set launch date-fire, ready, aim strategy-regardless of truly understanding customers, 3) an emphasis on execution instead of learning and discovery, 4) premature scaling the organization based on the assumption that sales forecast outlined in the business plan will happen, and 5) assuming that all start-ups are the same, while entering an existing or new market requires other areas to focus on. To overcome these shortfalls, Blank and Dorf (2012) and Blank (2013a) argue the need for a Customer Development (CD) process as a companion to the PD process with a focus on customer-related activities. The CD process comprises four steps: customer development—discovering whether the problem, solution and customer hypotheses in the business plan are correct—, customer validation—get validation that customers perceive value and find a repeatable and scalable sales model-, customer creation-exploit the validated sales model and create more end-user demand—, and company building—transforming the organization from learning and discovery-oriented towards mission-oriented departments for efficiency purposes (Blank & Dorf, 2012; Blank 2013a). In contrast to the linear fashion of the PD-approach, the CD-approach includes iterative cycles within each of the four steps which need to be validated before continuing to the next step. "What separates successful startups from unsuccessful ones is not necessarily the fact that successful startups began with a better initial plan, but rather that they find a plan that works [...]" (Maurya, 2012, p. xxi). Entrepreneurs in especially the web, mobile and cloud-app markets were early adopters of the CD-approach to acquire early customer feedback (Blank, 2013a). One of such entrepreneurs—and a former student in Blank's class—is Eric Ries, who coupled the CD-approach with agile (software development) practices and the lean philosophy (Maurya, 2012), which today is known as the Lean Start-up Methodology (LSM).

There is surely nothing quite so useless as doing with great efficiency what should not be done at all—Peter Drucker (1963).

One of the fundamental underlying principles of the LSM alongside CD is Lean thinking. The lean philosophy founds its origins in the Toyota Production System (TPS) and is introduced as an antidote for Muda, a Japanese word for waste (Womack & Jones, 2003). Within TPS, lean emphasis on doing more with less while coming closer towards what customers exactly want (Womack & Jones, 2003). In the context of the LSM, the organization predominantly takes a customers' perspective view and considers everything else than providing benefit to the customer as waste (Ries, 2011), rather than bootstrapping which is focused on keeping costs at a bare minimum (Eisenmann et al., 2014). From organizational-perspective, Ries (2011) stresses that all efforts that are not absolutely necessary for learning about what customers value can be considered as waste and must be eliminated. Moreover, this so-called 'validated learning' is "the process of demonstrating empirically that a team has discovered valuable truths about a start-up's present and future business prospects" (Ries, 2011, p. 38). Thus, the relation between lean start-ups and lean manufacturing lies not in scale efficiency, but rather in learning as quickly as possible to build a sustainable business (Ries, 2011). Finally, by using agile (software development) practices emphasized on rapid iteration, incremental developments, and small batches, organizations can speed-up their learning through the feedback loops (Eisenmann et al., 2013). The iterative and incremental nature of agile practices seek to avoid the dilemma of standard PD-approaches which are often too rigid, resulting in "[...] significant downstream pathologies, including excessive rework, lack of flexibility, customer dissatisfaction, and the potential for a project to be fully developed, only to discover that technological advances have eclipsed the need for it" (Serrador and Pinto, 2015, p. 1041). Moreover, the LSM benefits from incorporating agile practices since it identifies incorrect assumptions in early stages (Ries, 2011). Overall, using a user-centric approach—customer development—executed by using agile practices and based on an overall philosophy of lean thinking is what comprises the LSM, i.e. building a sustainable business by delivering what customers actually value. The following paragraph describes the process of the LSM.

Process

Derived from the three conceptual underlying principles previously discussed-customer development, lean thinking, and agile practices-the following practical principles guide the LSM process: get out of the building, minimum viable product, validated learning, pivot or persevere, and iterate rapidly (Nirwan & Dhewanto, 2015). Eisenmann et al. (2013) describe the LSM process as an iterative, hypothesis-driven experimental process of the following seven steps. Firstly, one starts with an ideation and develops a vision about which problem one wants to address and the potential solution(s) to solve this problem (Eisenmann et al., 2013). Secondly, the initial vision should be translated into falsifiable hypotheses (Eisenmann et al., 2013). Maurya (2012) uses 'lean canvas' to simplify and structure the formulation of falsifiable business model hypotheses. A business model (BM) articulates "the benefit the enterprise will deliver to customers, how it will organize to do so, and how it will capture a portion of the value that it delivers" (Teece, 2010, p. 179). Osterwalder et al. (2005) divide the BM into nine building blocks, i.e. value proposition, target customer, distribution channel, relationship, value configuration, core competency, network, cost structure, and revenue model. In the third step, the preparation for testing the hypotheses—assumptions—takes place by building a 'minimum viable product' (MVP); a version of the product based on a minimum amount of effort and development time (Ries, 2011). "Each MVP represents, with respect to product functionality and the operational capabilities needed to deliver that functionality, the simplest possible offering required to disprove a hypothesis" (Eisenmann et al., 2014, p. 2). The MVP forms the starting point of the "Build-Measure-Learn' feedback loop (Ries, 2011) and serves as a vehicle for value and growth-proposition validation (Maurya, 2012). However, the term 'minimum' does not imply a smallest product and also should not be regarded as low-quality, an element the PD-approach lies huge emphasis on (Ries, 2011). Since most start-ups don't understand their customers' needs, they cannot determine critical quality levels in their early stages (Ries, 2011). A MVP can take different forms, such as a smoke test—testing demand for a product which does not even exists (Eisenmann et al., 2013) -, a demonstration video (Eisenmann et al., 2014), a concierge MVP—manually processing, instead of using atomized tools (Ries,

2011)—, or early prototypes (Ries, 2011). In the fourth step, the organization should prioritize which test to be performed first. Both, Ries (2011) and Maurya (2012) stresses that in the initial stage of the start-up not all hypotheses of the various building blocks should be worked out in detail, but one should prioritize and address the most riskiest first. Ries (2011) calls these the 'leap of faith' assumptions and argues that two hypotheses should be addressed first, i.e. the value hypothesis to validate whether the proposed solution is valued by customers and the growth hypothesis to validate whether there is evidence for actual demand for the product. Addressing other hypotheses first will be considered as waste if the leap of faith assumptions eventually will not be validated. During the fifth step, the potential early adopters are confronted with the MVP. The start-up now qualitatively gather real-customer feedback and starts testing and measuring accordingly (Eisenmann et al., 2013; Ries, 2011). In the initial stage, Ries (2011) argues to focus on early adapters, rather than directly addressing the mainstream customers, because early adopters are more open for new and often not fully developed, solutions to their problems. In the sixth step, the start-up decides whether to persevere—adopt—, pivot—adjust—, or perish—abandon—the intended strategy and BM based on the learning it achieved from previous step (Eisenmann et al., 2013; Ries, 2011). After conditional validation of all lean canvas hypotheses, and thus seemingly having achieved both a problem-solution and product-market fit, the start-up can persevere and scale-up (Maurya, 2012). This leads the startup to the final step of scaling by quantitatively verifying whether these hypotheses remain to be true to a larger audience (Maurya, 2012). Based on learning from especially the leap of faith hypotheses, the start-up can select the most appropriate engine of growth and associated metrics to focus on. There are three primary engine of growth (Ries, 2011): the sticky growth engine—acquiring new or retain existing customers—, viral growth engine—happens as a side-effect of product use such as network effects—, and the paid growth engine—increase revenue from customer or drive down costs. Due split experimentation—A/B testing—with a treatment and control group, the start-up can test incremental changes based on customer feedback (Eisenmann et al., 2013). To measure the effectiveness of development efforts, Ries (2011) strongly recommends to use innovation accounting, rather than using gross numbers of standard accounting, i.e. vanity metrics. The problem with the latter is that they show cumulative numbers of a certain period of time and makes it hard, if not impossible, to trace the results of incremental changes. By applying coherent analysis, innovation accounting, the start-up can trace the results from each separate group of the split-test experiments. Instead of different results between groups of consequent A/B tests getting vanished into gross number, the start-up can accurately measure the consequences of its incremental changes (Ries, 2011). A key characteristic of the LSM is that even after verifying and scaling-up, the experimenting continues, although the focus shifts from strategy and BM validation towards organizational optimization (Eisenmann et al., 2013).

Purpose

At its core, the LSM is an antidote for the lethal problem which can be derived from Drucker's (1963) statement—quoted earlier in this section—, i.e. successfully executing a plan that leads nowhere (Ries, 2011). Rather than focusing on functional efficiency, the real emphasis should be on learning what is currently unknown or not validated (Ries, 2011). The LSM addresses this by incorporating agile practices, thus doing iterative, small batched, trail-and-error based experiments (Trimi & Berbegal-Mirabent, 2012). The hypothesis-driven nature of these experiments serves the purpose of testing; the central topic of this research. It is based on the 'fail fast' concept, i.e. the sooner a hypothesis is invalidated, the sooner one can pivot, instead of wasting time and resources (Mueller & Thoring, 2012). The LSM is a " systematic process for iterating from plan A to a plan that works, before running out of resources" (Maurya, p. xxi). Next, Ries (2011) argues that the LSM is well suited to serve the purpose of addressing the explorative activities next to the exploitative activities of established firms. Many companies are adept in refining their current business, but fail when it comes to pioneering radically new products and services because exploitation emphasis on efficiency, higher productivity, controllability, certainty, and reduction of variation, whereas exploration emphasis on search and discovery, innovation, and variation, thus making the two approaches requiring different

organizational configurations (O'Reilly & Tushman, 2008). Organizations can choose an ambidextrous organizational configuration to perform both activities, i.e. split the exploitative business units from the explorative ones, which allows to implement different structures, processes and cultures simultaneously and only linking these units at senior executive level (O'Reilly & Tushman, 2004). However, Ries (2011) proposes the usage of what he calls 'an innovation sandbox' where teams can create experiments that only effects certain customers or product features without interfering with the established organizational activities. He favourites this approach above adapting to an ambidextrous configuration, because the teams operate within the established organization's units, thus enhancing customer feedback sharing, fast communication, and avoid silo-effects. Finally, the LSM aims to avoid that a start-up instantly start executing a strategy or endlessly refine its strategic plan in the formulation stage by only focusing on those areas that matter at a specific point in time (Eisenmann et al., 2013; Ries, 2011). Rather than focusing on executing on a BM, it seeks for a sustainable BM (Blank, 2013b), i.e. it is a BM-driven approach pulled by user needs (Ries, 2011). Overall, the LSM its purposes can be summarized as: focusing on what should be built, validated learning based on continuous small, iterative, trail-and-error experiments, serves as a framework for established organizations to explore opportunities besides their exploitative activities, and searching for a sustainable business model. The next paragraph discusses the advantages and disadvantages of applying the LSM.

Advantages & Disadvantages

The underlying concepts of the LSM makes the framework more appropriate to deal with today's uncertain business environments due iterative and incremental adjustments, flexibility, freezing design features in the latest stage, and customer interaction (Serrador & Pinto, 2015). It recognizes the fact that initial strategic plans often require adjustments to become sustainable, and that a startup's focus should be on adapting a process to discover a plan that actually works (Maurya, 2012). The start-up first qualitatively validate its BM hypotheses and consequently quantitatively verify the correctness of provisional validated hypotheses for a larger sample of customers (Maurya, 2012). Furthermore, the organization could immediately start with experimentation after formulation of BM hypotheses, whereas approaches based on strategic planning will take much longer (Ries, 2011). Thus, no time is wasted on detailed and many paged business plans which rarely survive first customer contact and often are only demanded by venture capitalists (Blank, 2013b). The LSM makes the process of starting a company less risky; "It favours experimentation over elaborate planning, customer feedback over intuition, and iterative design over traditional 'big design up front' development" (Blank, 2013b). Nevertheless, the LSM has some important limitations as well. In their study, Nirwan and Dhewanto (2015) found the limited number of customers for meaningful validation, a lack of big problems to make a pivot or persevere decision, hindering due regulation and administrative tasks for quick iterations, and confusion about MVPs, as practical limitations of the LSM when it was applied in a B2B context. Harms et al. (2015) also argue that the LSM might be less suitable when dealing with technology uncertainty in B2B context because of practical issues such as differences in preferences of buyers and users, geographical distance with customers, limited possibilities to making incremental modifications afterwards, legal and secrecy issues, and credibility and reputation loss by using MVPs. However, Ries (2011) stresses that MVP's and low-quality products are essentially different since a MVP is based on a minimum amount of effort and development time, and is introduced in an early stage where no quality levels can be determined yet. Furthermore, Eisenmann et al (2013) mention that the strength of the LSM is offset when there is zero tolerance for mistakes, when uncertainty about customer demand is low, and when long product development cycles precludes launching in a 'early and often' fashion. Indeed, tolerance for mistakes and learning from mistakes forms a precondition for successfully applying the LSM and must be embraced by senior management (Ries, 2011). Especially established organizations might experience this as a major challenge since their configurations are primarily efficiency and productivity oriented (O'Reilly & Tushman, 2008). Table 6 gives an overview of the advantages and disadvantages of LSM.

ADVANTAGES LSM	AUTHOR(S)	DISADVANTAGES LSM	AUTHOR(S)
It avoids the pitfall of taking a just-do-it or waterfall approach,	Eisenmann et al., 2013;	Difficult to apply outside its original context, i.e. B2C	Harms et al., 2015;
by testing BM hypotheses in the earliest stage of a start-ups	Mueller & Thoring,	software-driven start-ups	Nirwan & Dhewanto,
lifespan	2012; Ries, 2011		2015
Framework to deal with today's uncertain business	Serrador & Pinto, 2015	Validation of ideas or generation of statistical test	Harms et al., 2015;
environments due iterative and incremental adjustments,		results can be hard due limited customers in B2B	Nirwan & Dhewanto,
flexibility, and freezing design features in the latest stage		contexts	2015
Deals with high levels of uncertainty about the viability of their	Eisenmann et al., 2013;	The decision to pivot or persevere is not always	Nirwan & Dhewanto,
intended business plan	Ries, 2011	obvious due a lack of big problems	2015
Qualitative validation of BM hypotheses and consequently	Maurya, 2012	When long product development cycles, massive	Eisenmann et al., 2013
verifying the correctness of provisional validated hypotheses		infrastructure deployment for example, precludes	
for a larger sample of customers		launching in a 'early and often' fashion	
Early customer interaction & feedback	Maurya, 2012; Ries,	Users and buyers as distinct parties in the B2B	Harms et al., 2015
	2011	markets; necessities a focus on both preferences	
Testing due experimentation is more accurate and often	Ries, 2011	Difficulties or confusion with MVPs since B2B	Harms et al., 2015;
reveals surprises		partners often expect a working product	
A 'fail fast' concept; the sooner a hypothesis is invalidated, the	Mueller & Thoring,	Concerns about credibility and reputation loss by	Eisenmann et al., 2013;
sooner one can pivot instead of wasting time and resources	2012	using MVPs.	Harms et al., 2015
Efficient allocation of a start-up's scare resources and time by	Ries, 2011	When there is zero tolerance for mistakes; impact	Eisenmann et al., 2013
solely focusing on activities that contribute to learning		on a customers' mission-critical activities	
Avoids decision-makers to get analysis paralysed by endlessly	Eisenmann et al., 2013;	Making incremental modifications might not be	Harms et al., 2015
refine their strategic plan	Ries, 2011	possible afterwards	
Can avoid optimism bias, confirmation bias, and sunk cost	Eisenmann et al., 2013	Other approaches might be more effective when	Eisenmann et al., 2013
fallacy due empirical real-customer data		uncertainty about customer demand is low	
Can be adapted by established organizations to explore new	Ries, 2011	Understanding customer problems requires insights	Harms et al., 2015
business opportunities besides exploiting its current business		in their daily activities; can be impede by legal,	
		security, and secrecy issues in B2B context	
Discover a plan that actually works	Maurya, 2012	Requires a culture for learning and tolerance for	Ries, 2011
		failure by senior management	
Makes the process of starting a company less risky	Blank, 2013b	Visiting customers is less practical in B2B	Harms et al., 2015
A user-centric approach with its core emphasis on learning	Ries, 2011	Fear of idea theft	Eisenmann et al., 2013
		Regulations and/or administrative tasks can hinder	Nirwan & Dhewanto,
		the benefits of quick iterations	2015
		Design and process development might be carried	Harms et al., 2015
		out simultaneously which limits the flexibility to	
Table 6: advantages and disadvantages of LSM		make product adjustments	

2.3.6 Cross-approach comparison

Taking previous sections on the five strategy testing approaches into retrospect, the following key distinctions can be observed (See table 7 & 8). Firstly, Scrum and the LSM are frameworks which provide broad structures, opposed to the other three approaches which give more prescription for practical usage. Secondly, the focal point of analysis varies among the approaches. Checklist assessments and the pre-mortem analysis take an internal perspective, interactive simulations focus on interaction with stakeholders in their business environment, and Scrum and the LSM take a customer or user-centric approach. Thirdly, both Scrum and the LSM bring forward the implementation stage by starting to deliver in the earliest stage. The other three approaches can only be meaningful when the strategy is, at least partially, formulated in advance. Fourthly, the knowledge generated from Scrum and the LSM efforts rely on real-life customer data—feedback. In contrast, the results from the other approaches are predominantly based on the strategists own perceptions and mental models, thus including assumptions instead of customer-driven data. Moreover, the knowledge generated from checklist assessments, the pre-mortem analysis, and interactive simulations are conditional since they are based on information and data at a specific point in time. On the contrary, due their continuous iterative cycles, the knowledge generated by Scrum and the LSM activities remains up-to-date. Fifthly, Scrum and the LSM are continuous processes of iterative and incremental adjustments. This forms an essential difference with the other approaches which are occasional events. Finally, checklist assessments and the pre-mortem analysis are argued to be applicable for all business contexts. The other three approaches lack academic support for their applicability outside their original context.

	KEY ADVANTAGES	KEY DISADVANTAGES
CHECKLIST	-Usability for all businesses	-Prone to partial usage
ASSESSMENT	(Simons, 2010a)	(Kahneman et al., 2011)
	-Highlight areas for improvement	-Can require much effort in information
	(Kraaijenbrink, 2015; Simmons, 2010b)	gathering & analysis (Kraaijenbrink, 2015)
	-Systematic assessment	-Less useful for high-validity environments
	(Kraaijenbrink, 2015)	(McKinsey, 2010)
PRE-MORTEM	-Identification of potential shortcomings	-Adjusting a plan, rather than abandoning
ANALYSIS	(Klein, 2007; McKenna, 2011)	it (McKinsey, 2015)
	-Tackle biases (Gross, 2014; Serrat, 2012)	-Significant need for an objective
	-Challenge the intended plan (Klein, 2007)	facilitator (Klein, 2007)
INTERACTIVE	-Testing strategy in safe environment	-Knowledge is conditional and only
SIMULATION	(Frost el al., 2012; Treat et al., 1996)	indicative (Rubel, 2006)
	-Life through experience (Chussil, 2007;	-Subject to human judgement (Menon,
	Frost et al., 2012; Kurtz, 2003)	2012)
	-Suitable for complex business dilemmas	-Requires data, executives time and
	(Oriesek & Schwarz, 2011; Rubel, 2006)	finance (Kurtz, 2003)
SCRUM	-Effectively manage unknown,	-Lack of empirical evidence for usability
	unknowable, or changing requirements	outside original context (Abrahamsson et
	(Schwaber, 1997, 2004)	al., 2003; Dybå & Dingsøyr, 2008)
	-Starts to deliver in early stages (Rising &	-Hard to apply in practical setting
	Janoff, 2000; Schwaber, 2014)	(Schwaber, 2008)
	-Enforces visibility & control (Schwaber,	-Requires a transition towards self-
	2004)	managing teams (Moe et al., 2010)
HYPOTHESIS-	-Discover a plan that works (Maurya,	-Difficult to apply in B2B context (Harms et
DRIVEN	2012)	al., 2015; Nirwan & Dhewanto, 2015)
EXPERIMENTATION	-Early customer interaction & feedback	-Launching early and often not always
	(Maurya, 2012; Ries, 2011)	possible (Eisenmann et al., 2013
	-Testing due experimentation is more	-Requires a culture for learning and
	accurate (Ries, 2011)	tolerance for failure (Ries, 2011)

Table 7: comparison of key advantages and disadvantages

	CHECKLIST ASSESSMENT	PRE-MORTEM ANALYSIS	INTERACTIVE SIMULATION	SCRUM	HYPOTHESIS-DRIVEN EXPERIMENTATION
CONCEPTUALIZATION	Using subsets of questions specified for specific strategy elements to assess—test—whether the strategy holds against relevant criteria	Testing a strategy by means of prospective hindsight, hypothetical failure, on its resilience for hypothetical future occurrences	Simulating a real-life business environment, subjected by constrains on resources, to test whether a strategy holds in its interaction with its stakeholders within its business environment.	Prioritization of activities and delivering increments in short cycles in response to (new) customer feedback	Seeking for a sustainable Business Model by (empirically) testing the validity of hypotheses by (early) customer feedback
ORIGINAL CONTEXT	Strategic management	Project management	Military	Software development (projects)	Software development (start-ups)
CORE PRINCIPLE(S)	Stress-testing	Prospective hindsight	Interactive, role-playing simulation	Agile	Customer Development, Agile, and Lean
ORIENTATION	Internal-orientation	Internal-orientation	Stakeholders interaction	Customer-orientation	User-centric
PRESCRIPTION	Tool	Technique	Technique	Framework	Framework
PROCESS	Systematically check off the criteria its strategy fulfils and holds an overview of the areas its strategy needs extra attention on	Individually brainstorm about all reasons that could have led to failure and collectively prioritize the items on their impact/probability rates	Several role-playing simulation rounds with actors representing key stakeholders to test strategic initiatives in respect to hypothetical actions and counteractions by other stakeholders	A launch-early-and- often approach based on short iterative and incremental learning cycles.	A fail-fast-to-succeed later approach based on iterative and incremental feedback- loops.
CONTENT (MEASUREMENT)	Relevant criteria for the entire or partial strategy, e.g. checks on coherence, scope, uniqueness, sources of competitive advantage, flexibility, biases, etc.	Impact & probability estimations of potential failure reasons, and cross-comparison of these items for prioritization purposes.	Prognoses of financial ratios, market capturing, market trends, economic developments, and team rankings	Sprint progress for tracing product development, customer requirements, and customer feedback.	Hypotheses of the nine building blocks of the (lean) BM canvas, innovation accounting/cohert-analysis for customer behaviour, and A/B testing for product & customer behaviour.
Ουτρυτ	Check/no-check overview of criteria that are met	Action plan with activities to mitigate highest priority failure reasons	Action list based on estimated outcomes of teams their performances	Working increment & re-prioritization of product backlog	Decision to persevere, pivot, or perish based on validated hypotheses.

Table 8: overview key characteristics of the five strategy testing approaches

3. Methodology

3.1 Research Framework

For making a justified decision concerning the appropriate approach for conducting the practical part of this research study, a framework has been used to systematically guidance this decision-making process. For this study, the research framework provided by Creswell (2014) has been adapted for its comprehensiveness, but yet its simplicity. Creswell (2014) argues that a research approach is the result of the interconnection of the following three main components: 1) Philosophical Worldview, 2) Research Design, and 3) Research Method(s).

3.1.1 Philosophical Worldview

There are two main streams concerning the role of theory in relation to research, i.e. ontological and epistemological orientations (Bryman & Bell, 2011). The first, ontological orientation, is concerned with the nature of social entities and questions whether "[...] social entities can and should be considered objective entities that have a reality external to social actors, or whether they can and should be considered social constructions built up from the perceptions and actions of social actors" (Bryman & Bell, 2011, p. 20). The objectivism position within this stream views social entities as the former, i.e. social entities that are independent or separated from actors. In contrast, the constructionism position considers social phenome from the second perspective, i.e. social entities are constructed and continuously revised by social actors. The second main stream, epistemological orientation, questions what should be regarded as acceptable knowledge and how the social world should be studied (van Willingenburg, 2010). The positivism position calls for the application of principles and procedure of natural sciences for studying social phenomena. This interpretivism position makes a difference between social entities and natural phenomena, thus stressing the need for a research strategy that allows for subjectivity and interpretation (Bryman & Bell, 2011). Since strategic management is regarded as a social science and strategic decisions are made by social actors with respect to their interactions within their social reality, this research takes a constructionistontology, interpretivist-epistemology orientation. This orientation steers the next decision, i.e. favouring a qualitative research design (Bryman & Bell, 2011).

3.1.2 Research Design

A qualitative research approach has been chosen for this study, since the main purpose of this study is to explore whether, and how, start-ups test their initial strategic initiative(s). This is exactly what qualitative research ought to accomplish, i.e. "[...] exploring and understanding the meaning individuals or groups ascribe to a social or human problem" (Creswell, 2014, p. 4). This sense-making of underlying values and reasoning is particularly difficult to grasp by a quantitative—numerical—approach. Indeed, Paley (2010) stresses that qualitative techniques emphasis on experiences, beliefs and meanings of the respondents which are by nature difficult, as not impossible, to measure quantitatively. By means of qualitative research, the focus lies on words, meanings, and context (Bryman & Bell, 2011). A multiple-case study design will form the foundation of this study. This study design is chosen instead of a cross-sectional design, because the focus is to elucidate the unique context of the cases—business context—, making a multiple-case study design more appropriate (Bryman and Bell, 2011). This ideographic approach provides an in-depth understanding, where each case is an object of interest in its own right and in its social context (Bryman & Bell, 2011).

3.1.3 Research Method

Taking previously discussed aspects into consideration, semi-structured interviews were used as a research method. Semi-structured interviews contain a list of specific questions which are incorporated into an interview guide to keep the interview focused on the topic of interest, while at the same time providing the interviewee with a high degree of leeway to answer the questions
(Bryman & Bell, 2011). Furthermore, the flexibility in structuring their responses is enhanced by means of open-ended questions, which are preferable when conducting an exploratory study (Aberbach & Rockman, 2002). Besides the questions which are documented in the interview guide, the interviewer asked additional questions—follow-up questions—for further clarification to fully grasp the motives for the respondents behaviour or actions. As argued by Bryman and Bell (2011), semi-structured interviews can have the following advantages: 1) they enable the interviewer to gather rich and detailed answers, 2) the perspective of the interviewee forms the central point, 3) they offer flexibility and might even result in adjustment of the emphasis of the study in case of new significant issues or insights, 4) they enhance consistency and cross-case comparability because all basic questions— as stated in the interview guide—will be asked in the same fashion, 5) the results remain in their original context, and 6) in case of face-to-face interviewing, it allows for non-verbal observation.

3.2 Data Collection

3.2.1 Preparing the semi-structured interviews

Preparing for the semi-structured interviews starts with the formation of an interview guide. Although an interview guide can take several forms—schematic, flow-chart, table—,this study used a table layout. There are two important criteria for the interview guide: 1) the questions should not be too specific such that alternative avenues of enquiry are hindered, and 2) the questions should avoid to steer the interviewees in their responses (Bryman & Bell, 2011). This study's interview guide contains of four main categories of open-ended questions, i.e. general questions, context aimed questions, content aimed questions, and process aimed questions. The interviews were performed due face-toface interviewing for in depth-insights, understanding, and for clarification about ambiguous answers (Healey & Rawlinson, 1993). The interview guide (see appendix 1) is derived from the following operationalization, devising measures of the concept (Brymann & Bell, 2011), of the case study.

Operationalization

Although a brief explanation about the purpose and the central topic of the interview had been illustrated during the contact moments with the interviewees for interviewee arrangement and scheduling, the interview started with a brief clarification about the purpose and data processing. After agreement from the interviewee, the actual interviewee started with general questions. These questions concerned the function, educational and working background of the interviewee, and general information about the venture, which were aimed for verification purposes whether the interviewee met the criteria, i.e. founder and executive who is concerned with the strategic decisions within the venture. Consequently, context-oriented questions were asked to clarify in which context the results should be interpreted and for indication of the generalizability of the results. After these warming-up questions, the focus shifted towards the specific domain of this research study. Firstly, the interviewee was asked about the trigger to start up the venture, e.g. was this based on existing market demand, elaborating on success of other organizations, or introducing a new innovation into market? Insight on this manner were used to reveal first signs of testing or validation efforts and to identify whether there exists a seemingly connection with the approaches they have taken. Furthermore, the interviewee was questioned about the status of the venture its strategy, i.e. is the strategy formalized and/or implemented? The remaining questions were focused on content and process, i.e. what is done for strategy testing or validation purposes and how is this realized.

The process-oriented questions aimed to gain insights into the strategy testing or validation approaches the case ventures are using and how their strategy testing process is performed. Firstly, the interviewee was asked about the approach that is used for testing or validation of the strategy. Is this approach included in the literature review, and does it match with the conceptualization of a certain approach? Moreover, the interviewees were asked to describe the steps of their strategy testing or validation process to assess whether this process demonstrates similarities with the processes described in the literature review, e.g. is a pre-mortem analysis performed by firstly individual brainstorming, then collectively set up a list, estimate probability and impact, and finally

prioritize actions, or is this done otherwise? In addition, questions were ask about the measurements which are performed during testing or validation activities. Are tools or certain methods used for measurement purposes, e.g. are financial ratios and market capture rates used as with interactive simulations, or does the organization conduct A/B testing as suggested by the LSM? Furthermore, when did the strategy testing activities started, or is this a continuous process as with Scrum and the LSM? In addition, questions were asked about why this approach has been chosen, and what the reasons are for not adapting another approach. Finally, the interviewee was asked about experiences with the chosen approach, i.e. what benefits are perceived and what challenges have been encountered? The interviewee was invited to discuss examples for clarifying his arguments and reasoning.

The content-oriented questions aimed to gather insights about what is measured with respect to strategy validation. What areas do the case ventures focus on, e.g. focusing on the complete BM as with the LSM, stakeholder interaction as with interactive simulation, product development, or customers. Consequently, the interviewees were asked about what they use these measurements for and what learning effects and benefits they perceive from it.

After covering all the questions from the interview guide, the interviewee were given the change for questions and additional comments. Furthermore, the interviewer discussed findings from the literature review if requested by the interviewee. Finally the interviewee was thanked for providing the possibility for conducting the interview in name of both the student and University of Twente.

3.2.2 Unit(s) of analysis

This study focused on IT start-ups or young ventures in their formation or early growth stage (Dodge & Robbins, 1992). A start-up is defined as "a human institution designed to create a new product or service under conditions of extreme uncertainty" (Ries, 2011, p. 27). Dodge and Robbins (1992) categorize the stage where an idea or venture is turned into a business entity as the formation stage, and the stage where the business establishes itself through positive growth with a commercially feasible product and/or marketing approach as the early growth stage of an organization. The reason for choosing this unit of analysis is because (new) ventures in this stages are often confronted with high levels of uncertainty (Blank, 2010) and high failure rates (Bangma & Snel, 2009; Feinleib, 2012; Shane, 2008), which might foster a greater sense of urgency for these ventures to put more emphasis on strategy testing. Moreover, these ventures with a presumably limited portfolio of products and services eliminate the complexities which might be faced when selecting mature-establishedorganizations. This latter category of organizations might be more concerned with 'corporate level strategy' for multiple business units. In addition, established organizations might emphasis more on efficiency and exploitation of their established strategies, rather than testing their strategies. Furthermore, strategist—strategic decision-makers—in established organizations may not have been involved with the strategy testing activities, since they weren't active within the organization by that time. The assumption made here is that it is not uncommon that strategist are followed up during the ventures life-cycle where the earlier strategist put more emphasis on strategy development, whereas up followers lay more attention on refinement and efficiency. As stressed by Aberbach and Rockman (2002), respondents should be selected on the basis of what they might know in order to help the researcher to fill in the pieces of the puzzle. To cope with this later issue, interviews were conducted with founders of the ventures who are actively involved in the daily operations of the firm, i.e. founders who are executives of their ventures. Bryman and Bell (2011) argue that this activity often becomes more difficult when one wants to interview respondents of senior level. These authors suggest the following approaches: knock on the door and directly fish for the person who seems most relevant for the interview by telephone contact, or sending a letter. For this study, the latter two options were chosen, i.e. first contact by telephone and subsequently send an enclosure with information about the interview's objective by e-mail. The interviews were audio-recorded for the subsequent purpose of data analysis. Finally, ventures active within the IT-business were selected to demarcate the scope of this research study and to enhance the possibility for comparing them (see table 9).

	ORGANIZATION (CASE)	STAGE OF ORGANIZATION	BUSINESS CONTEXT	FUNTION OF INTERVIEWEE	LABEL
1.	HR-TOOL	Early Growth (<5 years)	B2B	Founder & Managing Director	FC1
2.	STRATEGY GROWTH MAPPING	Start-up (<1 year)	B2B	Co-Founder & Marketing Technologist	FC2
3.	DATA-ANALYZER	Start-up (<2 years)	B2B	Founder & Director	FC3
4.	WEB-SUPPORT	Early Growth (<5 years)	B2B	Co-Founder & Operational Director	FC4
5.	CUSTOMER FEEDBACK	Start-up (<1 year)	B2B	Co-Founder	FC5
6.	COMMUNITY PLATFORM	Start-up (<2 years)	B2B	Co-Founder & Marketing Director	FC6
7.	CROWD-RESOURCING PLATFORM	Start-up (<2 years)	B2B	Founder	FC7
8.	ANIMATION TOOL	Start-up (<1 year)	B2B	Founder & Director	FC8

Table 9: data collection sample

3.3 Data analysis

As recommended by Brymann and Bell (2011), the audio-recorded interviews—of approximately 35-45 minutes—and notes were translated into interview transcripts immediately after the interviews. The data collected from the semi-structured interviews was analysed and processed due coding. Coding is a technique for splitting up qualitative data by, [...] relating particular passages in the text of an interview to one category, in the version that best fits these textual passages" (Flick et al., 2004, p. 255). "A code in qualitative inquiry is most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data" (Saldaña, 2015, p. 3). Open coding formed the starting point, whereby the interview transcripts were thoroughly analysed and important aspects were coded (see figure 1).

"We have added a feedback button within the application. And we gather feedback by mailings. It is often sufficient to simply start a conversation, and then we get feedback and suggestions for additional features" (FC4) Figure 1: coding interview transcripts

For reliability purposes, this process was repeated for all interview transcripts with an in-between time lapse of at least one week. "In the test-retest method, a person codes the material once and without looking at the results re-codes the same material to see whether the first and second coding agree" (Gorden, 1998, 183). Next, the elements which were coded have been grouped by means of axial coding (see figure 2).



By means of cross-comparison tables, the results of all cases were compared for identification of patters in both similarities and differences, i.e. cross-case analyses. Finally, the main categories were selected and interpreted with respect to the study its objective(s).

Feedback button

3.4 Quality of Research

There are different criteria to assess a business research study on. However, some authors argue that criteria for quantitative and qualitative research should be essentially different. Bryman and Bell (2011) for example, state that reliability and measurement validity both concern with the adequacy of measures and thus are less appropriate for qualitative research. Lincoln and Guba (1985) address this problematic issue by arguing that qualitative research should rather be concerned with trustworthiness and authenticity. These authors found substitutes for quantitative validity and reliability criteria by means of the following four criteria for trustworthiness: 1) credibility, 2) transferability, 3) dependability, and 4) confirmability. Credibility questions the plausibility of the results. By means of interviewing, interview transcripts, and coding, the results of this study are backed up by in-depth information from the interviewees, i.e. the results are based on interviewees their citations. Transferability is concerned with the application of the results outside their original context, i.e. degree of generalizability. Due the limited scope of this study, this criteria might not be realistic. However, this should not be a major concern since this study ought to explore and gather (new) insights which can be the start of new theory development. Dependability questions whether the results would likely be the same at other times, which in quantitative research is referred to as reliably. By offering a high degree of transparency about how this research was conducted and by means of following a systematic approach of data collection and data analysis—coding—, this criteria is met from methodological point of view. However, due the nature of qualitative research and its acceptance for subjectivity, the results are driven by subjective data from interviewees and therefore are subjected to the integrity of these respondents. Finally, confirmability concerns the objectiveness of the researcher and the influences of personal values. By means of an extensive literature review, the foundations of this study are based on scientific knowledge. Moreover, the questions included in the interview guide are assessed for being too specific or steering the interviewee towards specific outcomes. By means of open-ended questions, the interviewer has provided a high degree of flexibility and leeway for the interviewee to answer the questions. The second element by Guba and Lincoln (1985) addresses the authenticity criteria. This criteria however focus on the political impact of the research study which is not applicable for this student thesis. It is beyond the scope of this research to enforce actions within the case units of analysis.

4. Results

4.1 Within-Case Analysis

In this first section, a discussion is presented for all of the eight individual cases, i.e. within-case analyses. For consistency purposes of this section, each case discussion is organized by the following structure: organization's context, origins of the organization, strategy, strategy validation approach(es), measurement—how and what, benefits, challenges, and solutions & actions.

4.1.1 Case 1: HR-Tool

This young venture offers an online HR application-tool to advance the HR-processes within organizations. The organization takes a 'dual approach' concerning their target market. The primary customer has been defined as "HR-managers within organizations or recruitment agencies who seek to assess the skills of candidates" (FC1), while the other group contains the app users which are the (potential) candidates for the vacancies. The value proposition is "to make the recruitment process more fun, concise, and more intelligent by disposing more data about candidates their skills" (FC1).

Opportunity identification

The idea for this venture and its value proposition is based on personal experience of the founder during his professional career where he provided courses and trainings to colleagues. "Things were getting a little bit boring and monotonous, because I was repeating the same story over and over again. To make it more fun, initially for myself, I had incorporated a variety of game elements within my trainings" (FC1). Encouraged by positive responses from colleagues, the founder made the assumption that by means of a video game, he could address the shortcomings in todays current recruitment processes, which are often based on questionnaires and thereby "[...] boring and less intelligent" (FC 1).

Strategy

The founder perceives business strategy as the answer to the 'how' question. "For me strategy gives practical effectuation to what we want to achieve, where strategy is the derivative of our mission" (FC 1). Although the organization has already started implementing its business idea, the strategy has not been formalized yet. "I see that implicitly strategy formulation gets shape during our daily routines and has a lead over the formalization of our strategy. However its main elements—capillaries—already exist within our DNA" (FC1).

Strategy validation

The founder used his prior working experience and the positive feedback from his colleagues as a first validation for the concept of the product—solution—offering. Furthermore, by mean of assessment rounds, the venture tries to identify areas for improvement in the product itself and what customers' needs or requirements are. In addition, the organization has "[...] composed a development scheme for the game side, the technical side, and we make use of MVPs to sketch, test, roll-out, and refine" (FC1). For the product development, the Scrum method is used with Sprints of one or two weeks and daily Scrum meetings. Furthermore, the organization tries to apply principles of the Lean Start-up Methodology by primary using the concept of the minimum viable product (MVP). But, like the application of the Scrum method, this primary serves for the same goal as the assessment rounds, i.e. to validate the product features or lack of features, rather than validation of the strategy in total. Finally, the founder and one of his colleagues periodically conducting 'sparring and brainstorming' sessions about the contours of the strategy, which are always followed by an assessment round of external advisors. "There always follows and extensive set of rounds for external control and supervision, with different advisors to test the hypothesis we made" (FC1). This assessment by external advisors is considered as a strategy validation approach, exclusively focused on the entire strategy, rather than only the product. When explicitly asked whether the remaining approaches from the literature review—checklist assessment, pre-mortem analysis, and interactive simulations—were applied, the answer was no. There are brainstorm sessions, but these are more oriented on the current situation and for operational planning, rather than strengthening the strategy by imaginary failure of it. Furthermore, the decision-makers do sparring-sessions, but not in a role-playing fashion.

Measurements

The interviewee primary used informal discussions with colleagues as a first measurement of product validation. Furthermore, he is "[...] frequently talking with (potential) customers, not necessarily to discuss the future strategic plan, but to find validation whether there is a need for our product, by mean of assessment rounds" (FC1). The usage of both, the MVP and Scrum methods primary serves the same goal as the assessment rounds, i.e. to validate the product features or lack of features, rather than validation of the strategy in total. Moreover, the development team makes use of a development scheme to manage the work and trace progress. Finally, the amount of customer is monitored. However, this number is not measured in relation to certain adjustments to the product.

Benefits from strategy validation

The perceived benefits apply more for managing product development by means of Scrum. The organization perceive this methodology as valuable for making the process more manageable and for accountability purposes. Furthermore, the founder states that the principle of the MVP and its benefit might become more obvious when it is applied more strictly than in current situation.

Challenges with strategy validation

The organization has experienced a couple of significant challenges and barriers related to its strategy validation. Firstly, they experience a difference in attitude towards their product offering from users and customers—buyers. The added value of the concept is recognized by the users—candidates, "we are mostly awarded by our users, for providing and illustrating a clear impression of the work activities that the candidate eventually will have to perform. It gives them a better job preview. However, we still need to increase the overall awareness by the customer—buyer—that our approach is the new step in the evolution of the recruitment process" (FC1). In addition, the interviewee acknowledged that the strategy doesn't match the perceptions of the clients because the product is to innovative for the conservative market they serve. "The world of HR currently doesn't emphasis on innovation, while we try to be as innovative as possible, this collides now and then" (FC1). Moreover, the interviewee argued that the game is a tool and not a goal, but they might have treated it like a goal on its own. "I think that we are offering to much, which are 'nice to have' for a customer, rather than 'a need to have' " (FC1). For this reason, the principle of a MVP seems not have been applied strictly. The interviewee expressed his scepticism about customer feedback for their specific business context, which he considers not always as valuable as assumed. "If you only listen to the customers, little information will be gathered since their conservative mind-set. I personally argue to guide your customer in what the future can offer and how to gain a lead" (FC1). Furthermore, the organization is facing a huge barrier from technological point of view. "Their exists an interesting schism, because the customers—big organizations—are still working with outdated/aged technology—hardware—and thus making it very difficult for us to run the latest game features and applications on the outdated hardware of these customers" (FC1). Finally, the product will take over certain activities of the customer, which is not always been received well by them.

Solutions & Actions

Although not stated as a pivot, the interviewee argues that a change in their strategic plan will be made. The main adjustment is to develop a focus strategy and offer a product which includes a broader set of activities of the HR process. "We want to zoom in into the process of recruitment and selection of the client, and account for a bigger part of this whole process. We want to become accounted for the development of vacancies, recruitment, and selection, and incorporate more social media streams

and e-commerce aspects to acquire more candidates for our customers" (FC1). Opposed to todays selection of candidates based on their historical educational and professional background, they want to visualize the candidates their skills. The interviewee believes that offering a more complete solution will better address the customer's needs, whereas they currently might have emphasised too much on the user. Furthermore, they are working to formalize their strategic plan in a clear and unambiguous way, which they want to use for the purpose of attracting external investors to realize the broadening of their product offering.

	KEY FINDINGS
STRATEGY (STATUS)	Formalizing
STRATEGIC APPROACH	Technology-driven
STRATEGY TESTING	Partially Scrum
APPROACH	
TESTING/VALIDATION	First product validation with former colleagues, assessment rounds with users,
EFFORTS	assessment of external supervisors, and a MVP.
MEASUREMENT AREAS	Primarily on product, product developments process, and finance
MEASUREMENTS BY	Informal discussions, interviews with users, and external controllers
BENEFITS	Scrum: manageability of product development process & accountability staff
KEY CHALLENGES	Different appreciation users and buyers, product-market misfit, too much
	emphasis on product features, customer feedback, adaptability of customers to
	product offering, sensitivity issues by customers.
SOLUTIONS	Adjustment and formalization of strategy, broadening usability of product,
	advance HR-processes, focus on customers—buyers, attract external investors.

Table 10: key findings case venture one

4.1.2 Case 2: Strategy Growth Mapping

This start-up offers an online management tool for translating strategy to operational level. The startup's initial primary customer was the marketing manager within organizations, but it has broadened its target market to consultants and investors due demand for the product offering by these parties. The value proposition is stated to "make it easier for the users to translate their strategy to operations by formulating good goals, and then not specifically aimed at whether it's smart of what they are doing, but more on whether it is at least complete and unambiguous" (FC2).

Opportunity identification

"The idea is entirely business driven" (FC2). Based on the experience of the founders within their consultancy working field, they noticed a pattern that showed up at most of the clients they worked for. As consultants, they wanted that everything that happens on operational level was steered by strategy. However, when they asked clients to show their strategy, they received all kinds of documents like PowerPoints and spreadsheets, and just a few of their clients were able to express their strategic plans in a clear way, where most of them proposed multiple visions. By conducting a project with a small set of clients to identify how they determined goals, they concluded that this activity was very difficult for them to do on their own. This had triggered them to start the venture to address this customer dilemma.

Strategy

Business strategy is perceived by the interviewee as "making the vision more concrete, so that it can be translated to execution; so the step between vision and execution" (FC2). Interestingly, when asked whether the strategy has been formulated for the organization, the interviewee immediately mentioned that they completely work according to the Lean Startup approach. "We are a big fan of Business Model generation, Business Model Canvas from Alexander Osterwalder, and value proposition for Strategyzer. We have done trainings ourselves with that since 2007" (FC2). Within the past five months, the start-up has changed the initial concept based on iterations, and very recently formulated its strategy.

Strategy validation

The founders have started to address the question about how goals within organization are determined since 2007. During that period, they developed tools in PowerPoint and Excel and primarily used it for their own consultancy work. "These tools have been validated by our clients and formed the start of our learning curve, and we further developed the concept since then" (FC2). The validation of the initial concept for the start-up was done by the following steps. Firstly, they had written all their ideas and past experiences on paper and worked out their Business Model Canvas and value proposition, which they considered as a rough validation. Secondly, they used their network of marketers and validated whether their intended product offering was interesting to them by conducting interviews. Consequently, they "have built a prototype, or more specific, only the mock-ups to illustrate what it would look like without actually being able to work" (FC2). Furthermore, they used a Beta-page and acquired Beta-testers, which the interviewee says to have reached a couple of hundredths. Since December 2015, they translated all their learnings and customer feedback into a sales tool. In sum, the interviewee said that the process went from "our experience, to a small group, a bigger group of Beta-tester, and now to a live product" (FC2).

In addition to the LSM, the organization does apply the Scrum methodology. They use Scrum as a complement to the LSM. "Because Scrum and LSM both have an Agile nature, they automatically can complement each other well" (FC2). The validation part lies more within the LSM, while the product development is done by Scrum principles. The start-up has shortened the sprints from three weeks to one week for demarcating tasks and eliminating room for escape.

No checklist is used for strategy testing purposes. The checklists which were used aimed to generate a community around the product. "From a book called 'Traction' we have selected a couple of channels which can be used to reach your target group, and used the checklists that were provided for these channels" (FC2). Finally, both interactive simulations and the Pre-mortem analysis are not used. The argument for not using a Pre-mortem analysis is because the interviewee considers himself and his business partner as very self-critical and often take into account the worst-case scenario, but don't do this in a structural fashion like a Pre-mortem analysis.

Measurements

When asked for measurements, the interviewee mentioned a couple of areas the start-up is focusing on. "We have incorporated a chat function within the tool, intercom, and by this we gather quite a lot of feedback, and furthermore we are able to see how people use the tool" (FC2). By this tool, the startup primarily collects quantitative data. Furthermore, qualitative data is collected due short interviews which are mostly conducted by usage of Skype. These conversations are mostly conducted for product validation purposes. In addition, by means of mock-ups, they had validated whether customers had interest in the product and whether they had confidence in the usability of the concept in practical setting. Moreover, the founders are using Pirate Metrics' provided by Dave McClure. "This is very interesting for start-ups, because these metrics focus on five phases in the customer file, the pipeline" (FC2). By usages of these metrics, the founders monitor the amount of new registers, retention rate, and amount of users that are leaving. The interviewee even stressed that these metrics will eventually be incorporated into the own application as well. Interestingly, the interviewee argued that individual aspects of the application are not measured because he considers them often as not valuable. "If you would consider the ROI of certain integrations and the amount of effort you have to do for it, then it would never come out. Some features just need to be integrated, while they don't significantly contribute to higher user satisfaction" (FC2). Finally, the start-up did not yet conducted A/B testing but is planning to do that later this year.

Benefits from strategy validation

The interviewee considers the relatively low costs that are required for starting with a plan according to the LSM principles as one of the most important benefits. He perceives the most important and most interesting benefit of the LSM in its reversed order of the common approach of first developing and then marketing a product. "A very interesting phenomenon is that rather than first building a product and then doing marketing activities, basically you now start mostly with doing marketing and assess were the most demand comes from and the product is steered towards that direction, it is very demand-driven" (FC2). In addition, the interviewee gave an example of a concept he had worked on in the past. The concept was good and there was demand for it, however, "what we did wrong was that we had traction, but we didn't had a BM in place to make profit from it" (FC2). This is something he highly value in the LSM approach and the usage of BM canvas, to seek for a profitable BM. Furthermore, he reasoned that Lean and software fit each other guite well and even states that "for software development, the LSM is 'the approach' of todays available methods" (FB2). Concerning the benefits of Scrum, the interviewee argued that it helps them to eliminate the room for escape and thus keeping the workload manageable and according to plan. Furthermore, he reasoned that when applied strictly and with great discipline, "Scrum can be the best technique when working in bigger teams, although it is not the holy grail yet" (FC2).

Challenges with strategy validation

The interviewee acknowledged that they have faced a lot of challenges. Firstly, they experienced a struggle with the concept of MVPs. "If there isn't much, then your product is viable very soon, but when there is a great amount of software on the market, then at least you have to meet the level of those competitors to keep up with them in a certain market segment" (FC2). For this reason, the interviewee thinks that the concept of a MVP is changing toward Minimum 'Lovable' Product (MLP) in certain industries and that they have experienced confusion whether the focus should be on 'what is the minimum that makes people enthusiastic and influence their decisions' or on 'is this just good enough for not dying'. He believes that gaining traction as soon as possible and forming a group of people around your product is the essence, otherwise it won't succeed. Therefore, the concept of a MVP as stated in literature might not work. In addition, the interviewee argued that only including features that are confirmed by observation tests of actual user-usage can cause more struggles. "It's like what can be seen with business travellers; about 83 percent includes the facility of a gym within hotels as part of their decision-making, while about 3 percent make use of it" (FC2). So, making a decision to include features should not merely be based on customer-usage behaviour, but also on their conscious decision-making motives the interviewee stressed. Secondly, the interviewee experienced difficulties with validation of the right revenue model. "I see an enormous price erosion, that even when you add much value with your product, it is still expected to be cheap because it is software" (FC2). Thirdly, even though the amount of interested people was very high, they found it way more difficult to let people actually interact with the product and make them paying customers. "Even though you found validation for the problem and for the solution, the moment you offer a working solution they are often not willing to pay for it, so it's not the real problem after all" (FC2). Finally, the start-up is asked to offer service and consultancy by customers who have been using the product for a while now.. "We didn't gained these insights because in the early validation stages, customers don't use the product intensively enough to sense these additional needs" (FC2). This has made the interviewee and his business partner to test new hypothesis concerning this element again.

Solutions & actions

The interviewee stated that they will continue to apply the LSM as strictly as they have done so far. "On one hand, it can be frustrating to do things over, on the other hand, these iterations are part of LSM" (FC2). He reasons that the main solution for their challenges is to keep repeating the process of iterations, and testing new hypothesis to get more understanding and grip on customer behaviour. "The first thing we want to achieve is to get the right product-market fit. And only then we might be willing to invest more money to extend the concept" (FC2). The founders are clearly conscious with their scale-up efforts. Furthermore, he emphasized that they want to make sure that all relevant metrics are in place. To address the need for additional services around the product, they want to experiment with a virtual assistant which is operated manually during this feature's validation stage.

	KEY FINDINGS
STRATEGY (STATUS)	Formalized
STRATEGIC APPROACH	Market-driven
STRATEGY TESTING APRROACH	LSM, Scrum
TESTING/VALIDATION EFFORTS	Validation with initial clients, Business Model Canvas and value proposition, interviews with customers, Prototype, Beta-page, and live product (MVP).
MEASUREMENT AREAS	Problem, product, customers, and finance
MEASUREMENTS BY	Informal discussions, interviews, Pirate Metrics, monitoring user-usages, and incorporated feedback function
BENEFITS	LSM: low costs, demand-driven, seek for profitable BM, fits good with software development. Scrum: managing workload, eliminates room for escape
KEY CHALLENGES	Concept of 'viable in MVPs, revenue-model, acquiring paying customers, and demand for additional services
SOLUTIONS	Continue to apply the LSM strictly, get in-depth understanding of customers, scaling-up after proven validation, virtual assistant

Table 11: key findings case venture two

4.1.3 Case 3: Data-Analyser

This start-up offers a web-application that supports customers for signalling recommendation areas, administration errors, and simple contact moments with their clients, i.e. effectively analysing their clients data. The target markets are "[...] accountancy or administration offices/agencies who are serving the MKB" (FC3), and the value proposition for customers is described as "atomising and visualizing their clients data, and pro-actively advising their clients to enhance client satisfaction".

Opportunity identification

The idea of the concept is based on the founder his personal experience as an account for more than twenty years and the possibilities that todays IT technology offers. "I saw this need from my own personal experience and within the market I was active in, and reasoned that perhaps this need also exists among other people, and if so, I could solve their problems by applying todays' IT technology" (FC3).

Strategy

The interviewee perceives strategy as "all the activities we do to realize our long-term ambition" (FC3). The start-up didn't formally defined its strategy, but loosely described it as "too cooperate with other parties to address deficiencies in accountant and administrative agencies their current client data-systems, and to expand to foreign markets after establishing a solid customer base within the Netherlands" (FC3).

Strategy validation

The interviewee was very clear when he was asked whether the strategy had been validated by a certain approach. "No, not at all, I didn't even made a business plan. I just paid a x amount of euros to a developer and said, okay this is what it think there should be made" (FC3). Although no strategy validation method was used in an explicit way, the start-up did performed a couple of activities to validate its initial concept. After identifying a problem based on his own experience, the interviewee worked on his concept besides his full-time job. "As an accountant, I basically was one of the potential

customers myself" (FC3). He mentioned that he had discussed his idea with a substantial amount of colleagues with similar functions. Besides, by being active within the target market for more than 20 years, the interviewee argues that he implicitly validated the potential of this market. "I know this market very well, but I didn't write it on paper" (FC3). When a software developer had finished the product he asked for, although not functioning well, visits to accountant agencies were done to validate whether it fitted their practice, and whether they were prepared to pay for it when it was fully operational. "The agencies I contacted in the early stage and from who I received positive feedback from, were those customers who were willing to try something new. So, this shaped the road we have followed so far" (FC3). In addition, the interviewee considered the price model of monthly fees as being validated by the established software-application markets in general; "it's becoming more and more common within our business, we are moving towards a cloud application, and then that's the pricing model" (FC3). Furthermore, the concept was presented to other software parties to question whether they were open for cooperation with the start-up. The interviewee reasoned that because the startup is privately funded, there was no need for strictly applying a certain strategy validation approach; "there was no one who asked for it and besides, I did had a certain amount of money I was prepared to invest" (FC3). The reason for not applying principles of interactive simulations—with a focus on competitors interactions—lies in the fact that the interviewee perceives the start-ups playground as a real niche market were no other party is currently focusing on. "No other party is focusing on this specific area. Some party offer products with by-products which overlaps the things we do to a certain degree, but not as their primary activity" (FC3). Although the start-up makes priorities, the things they add often require one or maximally two days of work and can be done by one individual employee. For this reason the Scrum approach is not applied yet.

Measurements

As indicated in prior paragraph, validation of the problem statement is done by informal discussions with colleagues, and validation of the solution-product offering-by formal conversations with accountants and other software parties. Although users and buyers are often distinct partiesespecially within bigger organizations—, the feedback is primary gathered from users. "For me it's important to listen to them and to understand what their needs are. This also makes it more concrete, and hopefully, they can transfer their enthusiasm to the person who has the authority to buy the application" (FC3). In a lesser degree, contact with buyers is also done to discuss the future direction of the customer organization and how the application can help to achieve this. Feedback is mainly gathered for product improvement purposes, rather than to validate other aspects of the strategy. This is a continuous process that has steered the development from the first—not well functioning application to a standardized solution. "We trace the usages of features within the product and in case a feature is only used by one specific party, we eliminate it out of the standardized product" (FC3). Furthermore, the start-up monitors its revenues and customer-base growth. Although they don't systematically measure the later. "The lead-time can sometimes takes up to six months before a potential customer becomes a paying customer because sometimes it requires some changes in the organizations IT infrastructure first, it is therefore not really meaningful for us to trace this in a systematic way" (FC3). In addition, the interviewee argues that one big customer organization with a great amount of users can immediately drive up revenue and the amount of active users. Therefore, the measurement of (potential) new customers is more based on intuition, rather than metrics or performance indicators.

Benefits from strategy validation

Although the start-up didn't explicitly applied a certain strategy validation approach, the interviewee mentioned some advantages from the approach he has taken. Firstly, the usage of a not fully working application is considered as the key for learning. The interviewee argued that it helped them to visualize the concept to potential customers. Moreover, the focus on user feedback is considered as the main driver for the start-up. "Sometimes users come up with very specific problems, which gives

input to our development process" (FC3). Moreover, changes in legislation become apparent due customer feedback, and after integrating features to cope with these changes in the product, it becomes available for all other users as well. For this reason, the start-up doesn't need to monitor these changes in legislation itself.

Challenges with strategy validation

The interviewee mentioned two main challenges which are related to technical and customer adaption issues. From technical point of view, the start-up struggled to fit the product to individual customer's IT systems. "After we had a first working application, it turned out it didn't fit and we needed to change it. [...] and even up to today, we still don't fit for certain agencies" (FC3). Because the IT-systems which the customers work with often slightly differ, the feedback of a sample of customers is not sufficient to generalize for the entire customer base. Therefore, feedback from each customer organization has to be gathered, which takes more time than initially was expected. Furthermore, the interviewee argues that as a consequence of this, the product included features which were only relevant for one particular customer and was causing confusion by the other customers. "A single customers really liked that feature, while the rest were like, 'what are they talking about, I don't recognise/perceive that problem'. That is something we need to manage better in the future" (FC3). Secondly, the interviewee stresses the challenge that lies in the adaption process of the customers themselves to the application; "what forms the bigger challenge is not our application, but the agency that needs the time to change and the time to get knowledge about the application" (FC3). The problem the interviewee acknowledges here, is that it is very difficult to influence that process because it's not feasible to act as a change manager within all their customer organizations. Furthermore, since the process to implement the product requires time, it often happens that customers postpone their order placement. "Our product enhances efficiency but isn't organizational-critical for our customers, therefore the lead-time for an actual order placement can sometimes take up to six months" (FC3).

Solutions & Actions

In order to cope with the main struggles the start-up has faced, the interviewee made the following decisions to (partly) solve them. Firstly, they made a clear policy that features which are exclusively used by one party, will only be available to that user for an additional fee or otherwise be eliminated. Secondly, the product only includes features that focus on the product its core purpose. "Customers question themselves, I have one euro, where do I spent it on, do I spent it on fancy images, or do we spent it on the entire data-analysis" (FC3). For this reason, the product contains no fancy images or dashboards and remains as basic as possible. Due these two decisions, the interviewee reasoned that it will allow them to work with one version of the product. As an additional benefit, the pricing of the product becomes more easily as well. "Otherwise you will have the endless discussion like: you have version 2016, you have to pay me an x amount of euros extra for version 2017, and they don't want this because they consider their current version as sufficient, and eventually you end up with all different versions that flow through each other" (FC3). Finally, the interviewee aims to use the channels of software partners to efficiently reach customers. These partners often know what systems the customers are using and thereby can significantly reduce the need for the start-up to visit these customers.

	RET FINDINGS
STRATEGY (STATUS)	Not formalized
STRATEGIC APPROACH	Technology-driven
STRATEGY TESTING APPROACH	No approach
TESTING/VALIDATION EFFORTS	Founder tested the application himself, discussed idea with colleagues, meetings with potential customers, meetings with other software-development parties, benchmarked pricing-model.
MEASUREMENT AREAS	Primarily on product, users, and finance
MEASUREMENTS BY	Formal and informal discussions, and monitoring user-usages
BENEFITS	Visualize concept by a limited working application, user and customer feedback for improvements and adjustments.
KEY CHALLENGES	Offering a standardized application that fits with all customers IT-systems, gathering customer feedback is time-consuming, dealing with unique customer preferences, customers adaption process, and long lead-time of actual order placements.
SOLUTIONS	Additional fees for exclusively used features, focusing on the product its core purpose, minimal amount of features, and partnering with other parties.

Table 12: key findings case venture three

4.1.4 Case 4: Web-Support

This young venture offers both, custom-made and standardized communication and web applications. The target market for custom-made solutions is "agencies who facilitate in the designs, ideas, or sketches of their clients and who need a technical partner to assist them in building this; so for them we are digital engineers" (FC4). The standardized products that are developed by the venture itself concentrate primarily on web shops.

Opportunity identification

The two founders share the same educational background and felt that they couldn't exploit their potential while working for their former employers. Based on the believe that they could offer better IT solutions and commercialize their own ideas, the two business partners decided to start up a venture themselves.

Strategy

Strategy is perceived by the interviewee as follow: "strategy for me is to determine what we want to do for the upcoming one or two years, what for product offering we want to have, what market we want to enter, and how we want to reach this market" (FC4). Although, the strategy is not specifically defined for the own organization.

Strategy validation

In the early stage of this venture, no strategy testing was done because of two main reasons. Firstly, in the first year the venture partnered with another—bigger—organization who funded their business and who immediately provided first customers from their own customer base. "For us there was somehow less urgent to do it. I understand that when you need external funding, from a bank for example, you need to validate your plan. But in our case, the first year was funded by a partner, so we didn't felt the need to do validation, and we didn't made a business plan either" (FC4). Secondly, in this early stage of the venture, they exclusively functioned as digital engineers. According to the interviewee "there's a strong demand for programmers, while the base of programmers is smaller" (FC4). This was a second reason for not validating their service offering. More recently, the development of a web shop for a certain customer has led to what is offered today as a standardized product. There was no validation done before this development process, because it was initially a custom-made product. However, the interviewee states that they observed that other organizations

whose businesses are based on e-selling experienced similar problems as this client, i.e. "[...] affordable websites that hinder growth opportunities due instabilities, and stable web shops that are very expensive" (FC4). The interviewee argued that the feedback and satisfaction of the original customer was a validation for their product offering. In addition, the two founders had discussed their plan with friends, family and their account, what they considered as a very basic form of validation. From that moment, the venture is trying to apply the principle of a MVP by offering standardized websites with initially the most basic features. For another standardized product, they use CD-ROM based content which is already on market for about 20 years and has been translated into a web-application in cooperation with the original content owner. The interviewee reasoned that the entire aspect of content has already been validated by the original owner. Furthermore, the interviewee said that they use a downsized form of Scrum by using a Scrum-board and occasionally working in Sprints, although they don't apply these principles strictly because of the small size of the team and the short communication lines. "I would say that we are basically non-stop aware of each other's progress and activities, but in an informal way" (FC4). No checklists are used because of a lack of a formal strategy. Interactive simulations were considered as not relevant, because the interviewee perceives the role of competitors as minor. "We merely take competitors into consideration because it's not that relevant for us since there are too few parties within our market, our market is not saturated" (FC4). Furthermore, the interviewee reasoned that the main competitive factor within their branch lies in the organizations their capacity and availability of time for taking customer orders.

Measurements

Although the interviewee argued that they try to apply the Lean Startup methodology, so far, only the principle of a MVP for product feature determination has been used. The venture doesn't use any metrics, and doesn't perform monitoring efforts of users behaviour. They merely rely on customer feedback concerning the stability of the website and to discuss areas for improvements or additional features which are requested by the user. "We have added a feedback button within the application and we gather feedback by mailings. It is often sufficient to simply start a conversation, and then we get feedback and suggestions for additional features" (FC4). In addition, there is no monitoring or measuring of the effect of new features. The interviewee argues that the features which are included, per definition make customers happier and are taken for granted. "Besides, in the beginning there is often a lot of room for improvement, so then the question of whether they like the older version or the new version is not that difficult to imagine" (FC4) he reasoned. The only real measurement that is currently done is focused on the firm's revenue. The firm has used the results of their first year as a benchmark for performance indicators for the succeeding years. "We monitor revenue numbers and we aim for about one-third of growth annually, we achieved this the first year and used it as a benchmark indicator" (FC4).

Benefits from strategy validation

So far, the venture only applies the principle of a MVP, but experienced a couple of benefits from it already. Firstly, the interviewee argued that it helped them to enforce a less ambiguous set of boundaries for a certain product. "By this, we try to avoid that we are blamed for not being able to offer a big solution for low costs. So by picking out the core, we will be able to deliver a product that satisfies them and which is appropriate to be introduced in the market" (FC4). Secondly, the interviewee reasoned that their website—MVP—offers only those aspects which are relevant for all customers and simply forms a basis from which additional features can be added for specific customer needs. "By means of a MVP, we can give our potential customers a better idea about our product offering, which is hard to clarify in words" (FC4). Furthermore, the interviewee said that they benefit from their downgraded Scrum method by working on smaller sub-parts of the product, thereby making better arrangements with the customers and managing internal workload distribution. Although these benefits are frequently not paying off, as will be clear in the next paragraph.

Challenges with strategy validation

Concerning strategy validation, or better state, the lack of strategy validation, the venture experienced a big failure in the past. Without having validated whether there was a market for it, they worked on a productivity package and already had built a substantial part of the package. However, since the development time had been exceeded, and thereby also the development costs, the venture suffered financial reserves to finance their marketing and sales activities. Without being able to fund the marketing activities and not willing to take risk for further development of the concept, the product eventually ended up in the online storage without ever being commercialized. Another difficulty that is stated by the interviewee concerns the usage of a MVP. "When you experience some struggles with a product, you easily can have the temptation to claim that there is something missing in the product, while there are so many facets that can cause the struggle" (FC4). Furthermore, the interviewee stressed that their customers are so focused on the product and are making suggestions for features based on their own experience. As a result, they automatically assume that it will increase their own user-base. "From our experience we have seen that this is not the case. In many cases, customer end up disappointed to see that adding a feature doesn't necessarily generates more order placements" (FC4). Another important struggle the interviewee acknowledged lies in the ability to estimate and manage the workload of projects or product development. "We have a tendency to be quite optimistic, or sometimes even naïve, about the amount of time we need to build things" (FC4). In addition, the interviewee mentioned that the Sprints are often interrupted because the team has difficulties to stick to the Scrum-board prioritization.

Solutions & Actions

Since the failure to market one of their earlier concepts, the interviewee said they have addressed the possibility for a repeating failure by "[...] developing less concepts and only do projects which can be financed ourselves from both, product development and marketing point of view, or, to find another party who can do the sales activities" (FC4). The later approach was successfully followed for a recent concept they have worked on. Furthermore, the interviewee stated that they want to apply the principles of Scrum more strictly to address one of the main problems, i.e. development times that exceeds planning, increasing costs, and interruptions in the Sprints. However, specific actions to realize this were not yet determined.

	KEY FINDINGS
STRATEGY (STATUS)	Not formalized
STRATEGIC APPROACH	Technology-driven
STRATEGY	Downsized Scrum
TESTING/VALIDATION	
TESTING/VALIDATION	Product validation by initial client, identification of similar problems by others,
EFFORTS	discussing concept with friends and accountant, and a MVP.
MEASUREMENT AREAS	Primarily on product, and finance
MEASUREMENTS BY	Discussions with customers, incorporated feedback button in the application,
	and benchmark of previous year's financial results.
BENEFITS	MVP: enforcement of boundaries for product, keep the product basic,
	illustrating concept to customers.
	Scrum: working on smaller sub-parts, managing workload, and better
	arrangements with the customers.
KEY CHALLENGES	Past failure due a lack of product-market validation, strictly applying the element
	of 'minimum' with a MVP, managing workload, and interruptions of Sprints.
SOLUTIONS	Developing less concepts—products, partnering with other parties, and applying
	Scrum principles more strictly.

Table 13: key findings case venture four

4.1.5 Case 5: Customer Feedback

This start-up offers a web-application for managing and gathering all customer data into one place. Initially they selected start-ups as their target market, but due disappointing results, the focus is now entirely on established organizations. The value proposition for the customer is stated as "[...] improving customer feedback-processing for both managerial and accountability purposes, and making the feedback processing more transparent for their customers" (FC5).

Opportunity identification

The interviewee identified a key struggle that he and the two other founders experienced. "We experienced that feedback comes from a variety of channels towards the organization, but that there is a lack of a clear process to make a certain person responsible for processing all this feedback" (FC5). The interviewee argues that, as a consequence, a lot of feedback simply isn't processed. Furthermore, the interviewee used tele-communication service desks as an example for services that are often negatively being experienced by customers, since there is no transparency whether the organization has done anything with the complaint or feedback. For this reason, the founders made the assumption that by enhancing the transparency of feedback-processing of their customers, the customer organization can improve its customer satisfaction level.

Strategy

The interviewee perceives strategy as: "how I will develop myself the upcoming three months, and how can I run faster than my competitors" (FC5). At the moment of the interview, the interviewee said that they were still searching for the rights strategy.

Strategy validation approach(es)

According to the interviewee, the founders apply some aspects of the Lean Startup methodology in a manner that suits their own situation best. "We don't breath the LSM or follow it strictly according to the books. It is more something that we are aware of and we apply these principles in our own manner" (FC5). After identifying the problem, the founders talked with people about the problem statement to validate whether these people recognized the problem, or whether the founders simply overreacted with their own problem. This validation was done within a 'slack community' where other founders and technologists share knowledge and experiences. Furthermore, the founders looked at the market and have written their Business Model Canvas and Value Proposition Canvas on paper. The interviewee stated that they also validated their product offering and revenue model by usage of the slack community. "We have asked them what they thought about our ideas, how they imagined to let it work in practice, and whether they were willing to pay for it" (FC5). The decision to implement certain ideas are based on the amount of votes for various ideas, which are published on a public dashboard. The interviewee stated that they perceive the usage of a landing page and a very minimalistic product, as the application of a Minimum Marketable Product (MMP). Moreover, the interviewee claims that the product itself connects well with the LSM aspect of validation by customer feedback. "Our product really connects to the Lean Startup Methodology, because it says that you need to validate everything you come up with, with you customers, and this is something our product eases for organizations" (FC5). The interviewee reasons that their development approach is more closely to Kanban, rather than Scrum. "We do use a Product Backlog, but we simply start with a task after completion of the prior task; we don't do this within a fixed timeframe as is the case with Sprints" (FC5). In addition, the interviewee reasoned that there is currently one developer, and that performed development tasks are not that complex to necessitate strict deadlines. Furthermore, the interviewee clearly stated that no checklist is used and that interactive simulations aren't applied as well. "If we would use that approach, I think we would pay too much attention to our competitors, and I prefer to improve ourselves, and to focus on our own product" (FC5). The team does perform retrospective interventions about what their feelings are, what they have achieved so far, what could had been better, and what the actions for upcoming period will be. However, this is more a periodic evaluation, rather than proactively strengthening the strategic idea, which is the principle of a Pre-mortem analysis.

Measurements

Much of the validation is done by usage of the slack community, which can be perceived as a big skype chatroom where both group-chats and individual chat sessions can be held. Measurement by this medium is primary focused on product and customer demand validation. Furthermore, the interviewee stated that individual chat sessions by video calls were also conducted to validate whether potential customers were willing to pay for the product offering. By means of a public dashboard with ideas, the founders measure the amount of positive and negative votes for each idea and use this for their decision making. The landing page initially functioned for subscription purposes. However, due a change of the target market the start-up is trying to approach, they are currently trying to gain new customers by visiting them on location. No A/B testing is done, since the interviewee argues that the customer base is to limited. "I do a lot of A/B testing for my other job, but what you see with software as a service, is that you often don't have enough traffic to start A/B testing in an early stage" (FC5). The team monitors daily registrations, but doesn't considers these numbers as very valuable. "Last week, our landing page was noticed by another company who placed it on its homepage which resulted into a peak in our traffic graph. That's nice, but that isn't something we are in control of ourselves" (FC5). In case subscribers leave the landing page, an automatic message is send to them with a short questionnaire to ask for clarification about their motives. Finally, the team keeps an eye on their competitor's actions by simply subscribing to their newsletters and twitter accounts.

Benefits from strategy validation

A major benefit that is perceived by the interviewee, is the decision to keep the product as minimalistic as possible. The team made an important pivot concerning their target market, i.e. changing focus from start-ups to established organizations. "During that time there wasn't a real product yet, so not many resources and time were wasted on the product" (FC5). Furthermore, the interviewee said that the interviews with (potential) customers were valuable and helped them to give shape to their product.

Challenges with strategy validation

The interviewee acknowledged that they have experienced a lot of problems. To start with the people who have been interviewed and who were very enthusiastic about the solution proposition, but didn't turned into paying customers. "They all said they were willing to pay, and they all liked the idea a lot, but none of them have decided to actually buy and use it" (FC5). As a consequence of the extremely disappointed amount of paying customers, the interviewee stated that they have made a pivot concerning their target market. Where the initial focus was on start-ups, they now focus on established organizations. However, this has resulted into other problems. On one hand, the specific target market is not clear at this moment and first needs to be validated. On the other hand, the interviewee mentioned that the focus on established organizations is more difficult than expected, since these organizations are less willing to cooperate and share information with another party about their customer feedback. In addition, the validation of an appropriate revenue model is very difficult. "The moment you ask how much they are willing to pay for that, the answer is almost every time the same; as least as possible" (FC5). Another problem the interviewee mentioned was their initial tendency to launch a product which included the integration of too many feedback streams. In line with this problem, the founders experienced confusion about MVPs. "From my belief, a MVP is a wireframe you can present to customer, while a MMP is a product one can use" (FC5). Moreover, the potential customers have difficulties to understand how they can work with the product. Finally, the interviewee mentioned that they often underestimate the amount of workload. He argued that this is partly the consequence of taking a Kanban approach. "With Kanban you even get the feeling of, okay I finished a tasks, so I take a break" (FC5).

Solutions & Actions

Although a pivot was made concerning the target market, the interviewee stated that the concept is still close to the initial plan. The founders are determined to restrict product development efforts to a minimum until they have validated their target market. To address the problem of their revenue model, the interviewee said that two decisions are made. Firstly, raessici. Secondly, the start-up offers (potential) customers their product offering for a fixed price, instead of a monthly fee. "What we currently do with a couple of enterprises is offering 'a proof of concept' of six months for a fixed price" (FC5). This proof of concept offers customer the product and an additional 120 hours, which can be used to adjust the product to their specific needs. Furthermore, the interviewee claimed that they will apply Sprints in a strict manner for these product developments so that they will deliver according to plan. The adjustments from the proofs of concept will be incorporate into the standardized product as much as possible. By this approach, the interviewee hopes to attract new customers and improve the product by the hours that were given to these customers.

	KEY FINDINGS
STRATEGY (STATUS)	Searching for a right strategy
STRATEGIC APPROACH	Technology-driven
STRATEGY TESTING APPROACH	No approach
TESTING/VALIDATION EFFORTS	Problem validation with founders of start-ups, BM Canvas & Value Proposition Canvas, solution and pricing-model validation with founders of start-ups, landing page, and MMP.
MEASUREMENT AREAS	Problem, product, customer and revenue-model.
MEASUREMENTS BY	Interviews in a 'slack community', rating ideas on public dashboard, amount of subscribers on landing page, and an automatic messenger.
BENEFITS	Minimalistic product, and insights from (potential) customer feedback.
KEY CHALLENGES	Turning potential customers into paying customers, pivot to another target market, reserved attitude of customers to share information, pricing-model determination, confusion about MVPs, customers don't understand the product, and underestimation of workload.
SOLUTIONS	Find validation for product-market fit, keep development efforts to a minimum, price-shooting, proof of concept, and working in Sprints.

Table 14: key findings case venture five

4.1.6 Case 6: Community Platform

This case venture initially started as an IT service-provider and offered custom-made IT-solutions. However, the venture has internally created a new department which offers online community platforms. "This separate product-orientation department is since 1.5 year and we informally consider this as a start-up for about half a year now, although we did not registered it as a new venture yet" (FC6). The interviewee said that they haven't determined a specific target market yet, but there are two criteria in place for customer selection. "Our customers need to have one or more of their processes online which are important for the organization, and our customers need to have an annual revenue above one million euros" (FC6). The value proposition of this product offering is stated to enhance the engagement and participation of community members.

Opportunity identification

The idea to start up the initial IT service providing venture was based on prior working experience of the two founders. "Inspired by what we experienced there, we believed that we could do similar things, but even better" (FC6). The experiences gained from the ventures early stage has led to the idea of their new informal start-up. Especially, the developed and success of a very interesting software platform for an international charity organization, "[...] you can call it intranet, or as we call it, community software" (FC6). The resulting success of this platform made them decide to start up this new informal venture.

Strategy

The interviewee defines strategy as: "to set a vision for the organization and to think about how to get there". The founders think two to three years ahead about how their organization should looks like and have formally stated these plans in a written document. "I have to admit that we haven't done that when we started as a service provider, but for this informal start-up we have focused more on these aspects" (FC6).

Strategy validation approach(es)

The interviewee acknowledged that they didn't used any strategy validation method before the commercial success of the original custom-made community platform for a big international charity. "We saw that this custom-made platform worked well, especially for the end users, and the customer was very satisfied as well" (FC6). Based on the 600 percent increase of volunteers the charity organization had gained, the interviewee saw this as a first validation of the product offering. Another validation for a key aspect of their product—open-source software—was based on the positive feedback of the users. "Fortunately, a big part of the users shares the vision of open-source software, their connection with the product is therefore also based on a share worldview" (FC6). After this success, the venture did market research for exploring the possibilities to commercialize the concept of a standardized community platform. "Initially, we didn't based our decision exclusively on market demand, but rather on the success of the original platform and additional market research" (FC6). Interestingly, the interviewee acknowledged that they started to use certain approaches as a result of the requirements for their external funding pitch. For this funding pitch, a portfolio had to be made with different aspects of a business plan. The first equity crowdfunding round was a success and the interviewee argues that this certainly is a validation as well. "If more than 200,000 euros of people believe in it, then somehow it has to be a good story, otherwise people won't make those investments. So, we somehow consider this as a validation of the strategy" (FC6). The interviewee stated that they are currently starting to apply principle of the MVP of the Lean Startup methodology, but that they aren't familiar with the rest of this method and therefore won't apply those for upcoming period. Furthermore, checklists for strategy assessment are not used. The team only used a checklist with all the requirements for the portfolio of the funding pitch. The development team usages the principles of Scrum-boards and Sprints. The interviewee reasoned that they already worked with these principles while they were working on custom-made products, although they do not use it as strictly as suggested by the books. Rather than performing a Pre-Mortem analysis, the venture performed an exit prognosis—which was also a requirement for the portfolio. "We made an exit prognosis for 3 years and we have described what we considered as our weaknesses and strengths, and how we try to deal with those in a wise manner" (FC6). Finally, the interviewee said that he was not familiar with interactive simulations. When explaining the method in more detail, the interviewee perceives the method as more valuable in situations where companies enter a 'new space' and are seeking for a position within this. "We are operating in a quite established playground, and fortunately, many of the big parties won't be on the radar because our small niche perhaps isn't interesting for them" (FC6).

Measurements

The success of the original community platform formed the first validation measure. The user growth rate of 600 percent, and the total amount of more than 50 thousand users were used as hard numbers for the product validation. In addition, market research resulted into numbers about potential customers, existing competitors and the market growth. Another validation measurement was based on the external funding of 200.000 euros. Besides these measurements, the interviewee stated that the main focus is on the product itself. "We have one employee who is exclusively concerned with user testing; who demonstrate prototypes and let users perform certain tasks with it. We monitor how well this is done, and what they think of it" (FC6). Although no A/B testing is done, since the team currently is using an 'Alpha version' of the platform and no MVP has been developed yet, the interviewee stated

that the Alpha version is used by two groups of users. Those who are involved since the beginning, and those who jumped in later without prior familiarity of the product. So rather than testing the effect of features, the interviewee argued that they test the usability and user-friendliness of the product. The interviewee stated that this form of testing is done with end-users and that interviews are conducted with the customer organization. These interviews focus more on what the customer would like to include in the platform and agreement on the platform its price. Finally, the entire concept and marketing plan have been assessed by financial advisors and external auditors for external funding purposes. Internally, the founders assessed whether the pitch portfolio was complete against the portfolio criteria that were determined by the equity funding agency.

Benefits from strategy validation

The interviewee stressed that the main benefit lies in the validation of the platform—product—by the experience of the original customer and users. Hereby, the product offering was already validated before the idea of commercializing it. Since no strategy validation approaches have been applied strictly, the interviewee had no additional benefits to mention.

Challenges with strategy validation

What the interviewee recognized when the venture exclusively operated as an IT service-provider, was the loss of focus due broadening of activities and target markets. Challenges concerning the new informal start-up lie predominantly at the product level. "In practice, we don't re-use that many codes of the original platform again. It has given inspiration for the concept, but the coding, the programming, and the architecture, is rather different" (FC6). For this reason, adjustments had to be made to make the product—platform—suitable for a broader group of customers. Furthermore, the interviewee pointed on the challenges when applying the Scrum method. "We experienced difficulties with the role of Project Owner, since it often isn't clear where this responsibility lies; with the customers or with us" (FC6). In addition, he argued that it is an intensive role and not everyone can commit to that. Another struggle the team is currently dealing with, is the application of a MVP. "We are worried because there are competitors in our segment who are a little bit ahead of us, so if you truly make a MVP, do you have something attractive that stands out, to get attention, and if you are really honest, maybe not" (FC6). Therefore, he reasoned that rather than restricting only critical to features, there should be features included to create a 'wow' effect that differentiates the product, although from critical point of view they might add no value. Finally, the founders recognized the potential threat of the freemium pricing model. "What you see is that in many markets the freemium model is very common, while in our market this is not the case, although not yet" (FC6).

Solutions & Actions

The interviewee discussed a couple of actions to address some of the challenges. Firstly, they further demarcated the target market. "We really focus on the volunteer and NGO market and we have decided to avoid intranet used in profit organizations for now" (FC6). By this decision, the interviewee argued that two challenges will be addressed. One benefit is that it creates more focus, while the other benefit is that they avoid to enter the segment of established competitors who already have a lead from technological point of view. Secondly, the interviewee wants that the development teams respects and apply the Scrum method more strictly. He reasoned that this should be feasible since 95 percent of the standardized platform will be developed internally. For this reason, the struggles with the accountability of the Product Owner could be reduced. Thirdly, the interviewee stated that they will perform A/B tests when the product will become live. By means of A/B testing, he hopes to gain more insights in the critical features that the MVP should have. Finally, the founders made a conscious decision about their pricing model. "We offer open-source software by a flavour of freemium, it's free, but it forces to buy up-dates during the time" (FC6). With this pricing model, they believe to pro-actively address the thread of freemium, and ideally, to increase the entry barrier for competitors to enter this specific niche.

	KEY FINDINGS
STRATEGY (STATUS)	Formalized
STRATEGIC APPROACH	Technology-driven
STRATEGY TESTING APPROACH	Loosely applying Scrum
TESTING/VALIDATION EFFORTS	Product validation by initial customer, starting with a MVP, and external audits.
MEASUREMENT AREAS	Primarily on product, users, and finance.
MEASUREMENTS BY	Interviews with customers, user-base growth rate of initial customer, amount of external funding, user-usages tests, split-group testing, and external auditors.
BENEFITS	Product validation by initial customer
KEY CHALLENGES	Adjust product to various customers, role of Product Owner, concept of MVP, and pricing-model.
SOLUTIONS	Demarcation of target market, applying Scrum more strictly, A/B testing, and a substitute pricing-model for freemium.

Table 15: key findings case venture six

4.4.7 Case 7: Crowd-Resourcing Platform

This start-up offers an online-platform that enables organizations to cooperate in temporary teams with each other, i.e. crowd-resourcing. The main target group is broadly defined as freelancers and established organizations, regardless of the industries they are active in. The value proposition is stated as "[...] offering organizations the ability to work according to an increasingly popular way of working by means of self-organizing teams in temporary projects, and thereby enhancing motivation, innovation and productivity" (FC7).

Opportunity identification

The interviewee and the two other co-founders share the same educational background and worked as freelancers. From this experience, they felt that there was room for improvement to enhance cooperation when working in teams. Inspired by working in self-organizing teams, the idea was born to develop an online platform to assist organizations in managing this process.

Strategy

The interviewee perceives strategy as answering the questions such as "[...] where are we going, how can we go there, and what activities will we perform along the way to reach this point" (FC7). The interviewee stated that the purpose of the start-up, the targets, and the strategy have been formalized.

Strategy validation approach(es)

"We don't believe in the sequence of formulation and implementation, because it is often way too complex to first think things through and then act upon, because by that time it has already changed. We reverse this, we first do things, then we look whether it has succeeded, and only then we start thinking" (FC7). The founders made a clear decision about what they thought there should be made without any testing or validation efforts in advance. The interviewee stated that the approach is inspired by practices about self-organizing teams, reinventing organizations, Scrum and the Lean Startup methodology. "It relates to Agile approaches like Scrum. We use Product Backlogs and work in Sprints, although we often use them as guidelines and not always applying them strictly" (FC7). Considering the Lean Startup method, the interviewee mentioned that they are using a 'Minimum Lovable Product' and hypotheses. Although these hypotheses are only formulated for areas they perceive as relevant and not based on the Lean Canvas. The reason why they use a minimum 'lovable' (MLP), rather than a 'viable' product, is because the founders argue that "at least you must love it to introduce it in the market". In addition, the interviewee questions the idea behind pivots. "We believe

that you should hold on to your original idea for a long time, because when you primary follow the market as a start-up, you are not busy with the initials that you had when you started the company" (FC7). What the interviewee considers as validation of their product offering is the amount of reactions they received on their landing page. Furthermore, the start-up was credited for being one of the most promising start-ups in 2015. In that same year, a substantial amount of crowdfunding was acquired which the founders also perceived as a validation for their concept. In addition, a Beta-version of the product was launched to test the platform with actual users, followed by a payment-version in the up following month. The interviewee reasoned that checklists are not useful for them, since they first start with doing and perform the thinking part afterwards. A Pre-mortem analysis was not applied for the same reason. Finally, the interviewee states that they conducted market research and claimed that no other party is offering a comparable online platform. "We have a niche market. There are marketplaces for zzp'ers, and there are tools for cooperation purposes. However, the combination of those two elements within one tool is unique" (FC7). In addition, the founder stated that they are "not a commercial-driven start-up, we are a social-impact start-up that is continuously working on our own mission". For this reason, the interviewee stated that interactive simulations-with a focus on interaction with competitors—is not worth the efforts.

Measurements

The founders did market research to identify whether a comparable online platform already existed. In addition, they perceived the increasing trend of organizations that are looking for new ways to organize work, especially by means of self-organizing teams and projects, as a relevant indicator to validate their idea. Concerning their product offering, the following measurements are continuously performed. Firstly, the measurement of which approaches actually work to attract new users. The interviewee stated that they often try different approaches and measure the success of each approach by means of acquisition numbers of new users. Secondly, the usage on the platform is measured to, "[...] gather insights in the types of usage and whether there is a recurrent pattern" (FC7). And thirdly, measurements are done on the element of matching users based on preferences, project criteria, and user profiles. This is done by means of project reviews where all participants can rate their team members. In addition, measurements are done to assess whether users are satisfied with the matches they receive. A dashboard is developed to measure and monitor aforementioned aspects. As mentioned in previous paragraph, a Beta-version was used to test the platform by real users. This Betaversion was based on the principle of a MLP with the purpose to test the quality of the platform and to measure the retention rate of users after real-life experience. Finally, the interviewee stated that revenue numbers are periodically measured.

Benefits from strategy validation

The interviewee stated that the approach of first doing and then thinking has the benefit of starting with the actual product in the earliest stage. Moreover, he reasoned that they highly benefit from the increasing trend of organizations that are looking for new ways to organize work. Furthermore, he stressed that using Scrum—although sometimes not strictly applied—makes them extremely flexible. Moreover, the interviewee stated that it enhances motivation of employees, "[...] because people feel like all their talent is used, and all participants are co-owners which results into extreme commitment and as a result a high level productivity, innovation and flexibility within the organization" (FC7). Finally, he reasoned that user feedback is highly valued and gives conformation that they are moving in the right direction.

Challenges with strategy validation

The interviewee stressed that their biggest challenge lies in the adaption process of the customers. He argued that organizations need to adapt to the platform and moreover, the underlying principles of self-organizing teams and temporary projects. This adaption often requires a different mind-set and change of the organization's culture which requires time. "The adaption speed of our customers for

our platform is very low, no matter how much they want it, they can adapt to it for a limit degree. This makes it difficult for us to visualize certain effects of our platform, because our customers partially use the platform and not in its totality" (FC7). As a result, customers are demanding for additional consultancy services. Furthermore, the start-up experiences struggles because they are sometimes going too fast which results in users whom are unable to understand what they are meaning. Finally, the interviewee mentioned that the Lean Startup method is primarily used for inspiration, rather than as a strict guideline. Firstly, the interviewee is not a proponent of pivoting. He reasons that organizations with a focus on social impact and community, rather than commercially-driven, should stick to their original idea and ideals to retain their identity. Secondly, rather than viable, they favour a Minimum Lovable Product which might include features that not necessarily contribute to value creation, but nevertheless enhance the emotions of users toward the product.

Solutions & Actions

To cope with the struggles which are experienced concerning the adaption process of customers, the start-up is nowadays offering additional consultancy services. "This is a necessary request from the market, because otherwise the organizations are unable to implement it" (FC7). Furthermore, the interviewee was very clear about actions that will be taken in case another party will offer a superior solution in the future with the same purpose. "We don't think in terms of competitiveness. In case there is a party that is better than us, we will join them and abolish our organization" (FC7). Finally, the interviewee stated that they will continuously scale-up and work incrementally to expand on global scale.

	KEY FINDINGS
STRATEGY (STATUS)	Formalized
STRATEGIC APPROACH	Technology-driven
STRATEGY TESTING APPRAOCH	Loosely applying Scrum & LSM
TESTING/VALIDATION EFFORTS	Landing page, and a Beta-version (MLP)
MEASUREMENT AREAS	Primarily on product, users , and finance
MEASUREMENTS BY	Research on project management trends, Dashboard (acquisition & retention rates, user-usage monitoring, and project reviewing), Crowdfunding, and their raking in a start-ups competition,
BENEFITS	Start with product developments in an early stage, focusing on an occurring trend, and user feedback. Scrum: enhances employees motivation, levelling up productivity, more innovation, and more flexibility.
KEY CHALLENGES	Adaption process of customers, no fully employment of the platform by users, demand for additional services, and no fully understanding of the product by users. LSM: pivots and a lack of emotional aspects in MVP features
SOLUTIONS	Offering additional services, and incremental product development and up- scaling.

Table 16: key findings case venture seven

4.4.8 Case 8: Animation Tool

The venture in this case discussion offers a tool that eases the way animations for the web can be developed and quickly adjusted at any time. The value proposition of the product offering is stated as; "[...] providing a mediating tool between the coding and actual visual output, which significantly enhances the productivity of the user" (FC8). In this early stage of the start-up, the target market is defined as developers and designers who are creating content for the web by means of animations.

Opportunity identification

As a freelance developer, the founder had to work on a website with a so-called 'parallax' effect and the designer wanted to have the ability to quickly adjust the animations on the website. To meet this requirement, the founder developed a prototype and eventually used it ever since for other assignments as well. Based on his own experience with the tool and the increase of his own productivity, he decided to further develop the prototype. "I started to notice that I was using this tool for every assignment I had, and then I thought that it might be reasonable to assume that it must have some kind of value, and that it could be good to share it with the world" (FC8).

Strategy

The interviewee perceives "the approach to get from A to B" (FC8) as a one-liner for strategy. However, no strategy has been formalized at the moment of the interview. "I have to admit that I didn't had, and still don't have, any strategy or plan. Initially, I developed the tool for a client and used it for my own profession without any intention to market it"

Strategy validation approach(es)

The interviewee reasoned that his own experience as a developer formed the first validation for both the problem and solution. "I had a need as a developer, I missed this and it wasn't available, so therefore I decided to make it myself. I was the first tester and target customer myself, since I target on developers and designers like myself" (FC8). In addition, by doing market research, he found validation that the product offering is different from other product offering. "There are a lot of comparable products, [...], but they focus on emotional or technical aspects of the product offering. I basically focus on, not the tool itself per se, [...], but more that you have a direct feedback of what you are doing, i.e. instant feedback" (FC8). The first validation with potential users was done by means of social media and blogs where he described the idea of the solution. This led to a high amount of positive reactions and formed the trigger to launch a landing page. "The first day I already reached about 4000 subscribers and within the first two weeks I was contacted by a couple of very big international operating organizations who invited me at their Dutch headquarters to discuss possibilities for partnering" (FC8). The interviewee reasoned that the interests of these large organizations, the amount of subscribers-120 thousand-, and the amount of visitors-60 to 100 thousand per day—, had given sufficient validation that he was on the right track and that he should continue to work on a Beta-version. For this Beta-version, the interviewee stated that he tries to apply the concept of keeping the features to a minimum. However, the principle of a MVP was not strictly followed since the interviewee believes that the idea behind the element of 'minimum' as described in the literature was difficult to apply since certain features were already, based on own usage, included within the tool, rather than incrementally validated by users. Furthermore, he argued that he cannot consider his approach as Lean, since he had spent a lot of time on learning how to develop the tool. "[...] It has also been a project where I personally learned a lot about the technical aspects. For this reason, it cannot be considered as Lean, since I spent a substantial amount of time on this while it didn't contribute to add value for the user" (FC8). Next, the interviewee stated that Backlogs are used and working in Sprints is tried to apply. However, the latter is done in a very loosely fashion since Sprints are often interrupted by side-activities. Since the founder didn't started with any strategy or plan, and there still isn't a clear determined strategy, checklist were considered as not relevant at the moment of the interview. Interactive simulations were not done because of a lack of familiarity with the method and because the interviewee argued that there are currently no direct competitors.

Measurements

The first measurement was based on own experience with the prototype and focused on the (technical) functionality of the tool. "I tested parts of the tool in isolation which enabled me to solve problems and fixing bugs more quickly" (FC8). Secondly, the interviewee did market research to identify whether there already existed tools that serve the same purpose. Next, the interviewee posted

his idea on social media and blogs. "By means of these posts, and the feedback that comes from it, my aim is to see and validate whether the direction I'm going to is the right one" (FC8). This measurement was done by counting the amount of followers, page-visitors, and manually categorizing the reactions as positive or negative. Fourthly, the interviewee decided to launch a landing page to measure the actual interest in the product offering by the amount of subscribers and requests for a Beta-version. Surprisingly, no interviews were conducted, since the interviewee found the amount of subscribers and the interests by big international organizations convincing enough to move towards a Betaversion. By means of the Beta-version, the interviewee stated that several measurements will be performed, i.e. measuring the amount of users as percentage of the subscribers-base, measuring retention rates, and getting direct feedback from users for improvements. "For me it is important to let the tool tested by a select group of users to see whether the thing you are making is actually good, both from technological and usability point of view" (FC8). Although the start-up applies the concept of a MVP in a loosely fashion, the interviewee acknowledged that no hypotheses are formulated. Furthermore, the interviewee stressed that no user-usage data will be gathered. "I believe these things should be optionally. I personally, as a developer, don't perceive it as correct that you gather data about user-usage without informing the users about it" (FC8). In addition, no A/B testing will be done with the Beta-version since the interviewee reasons that he wants to avoid working with different versions. Finally, the interviewee stated that right from the beginning, a Product Backlog is used to keep track of progress and tasks that need to be done.

Benefits for strategy validation

The interviewee perceives the close connection between the tool and his own background as the main benefit. "I was initially the first tester myself, I'm the target customer myself" (FC8). He believes that it is essential to speak 'the same language as your target group' and know what their daily activities— with respect to designing animations—are. Furthermore, he reasoned that the great amount of attention right from the beginning helped him to validate that he was on the right track. Moreover, he highly value the feedback he receives. "Some people had offered some suggestions, tips, and advice how I could do certain things. This feedback might offer insight I didn't think about myself beforehand and also steered me in the direction I'm currently following" (FC8). Finally, he stressed that it is important to offer a tool that is applicable to all websites regardless their coding framework, and more important, to offer a solution that is easily accessible for users to apply. "Naturally, it is important to include features that users are requesting for, however, you should not lose focus on the technical elements which reduce the barriers for users to use a tool. These technical aspects are hard to gather by user feedback since they often don't have enough technical knowledge to express this in words" (FC8).

Challenges with strategy validation

The interviewee mentioned the challenges and struggles the start-up has faced so far. Firstly, he stated that speed is an important factor from both financial and users point of view. In order to demonstrate progress, keeping the potential users—subscribers—triggered, and getting validation for the solution offering, he decided to launch a sub-element of the tool on the landing page. However, without the rests of the tool its elements, subscribers could only get a clue about the idea and nothing more. "A lot of people replied and asked how they could use it, that they wanted to use it and play with it. The amount of these kind of questions was overwhelming, so after a certain period of time I had to close it" (FC8). He learned that offering sub-parts of solutions was not welcomed by subscribers and even resulted in more pressure to launch a Beta-version sooner. In addition, he argued that the limited financial resources form a challenge when development is interrupted by side-activities, and in this venture's case, when the developers still have to learn programming themselves. He reasoned that keeping the 'momentum' by retaining the speed is key for retention of users. Secondly, the interviewee justified his decision to loosely apply the MVP principle. He argued that keeping this at a minimum causes confusion. "Sometimes you already have to add features which might not be apparent to users

in the early stage, but which will demonstrate their usage when they are in a further stage of their animation development" (FC8). Moreover, he reasoned that some features will only become visible when users extensively use the tool and thereby requiring certain features to interact with one another. In addition, he argued that starting with a more solid product, especially when it comes to a paying version, simply requires certain features that should not be pulled by users, e.g. privacy and security features. The latter is also considered as a challenge since the interviewee don't consider it as 'correct' when user-usage data is gathered without informing the users about this. Finally, he acknowledged the challenge of getting the revenue-model right for two reasons. Firstly, he argued that it is hard to find a proper price when the product is still in a fragile condition. Secondly, he perceives that the amount of money you can ask is related to the expectations of the users. "The more you ask for it will go hand-in-hand with the expectations that comes from it with not only respect to the quality level, but also the speed of updates you have to offer" (FC8). For this reason, he argued that price should also be in line with the internal capabilities to speed up development, which is a key challenge for start-ups with limited (financial) resources.

Solutions & Actions

To keep the 'momentum', the interviewee stated that a clear determination has been made to launch the Beta-version, to validate the product offering, and to release a payment version within two months. As a (temporary) solution for determining the right payment-model, a fixed payment has been selected by benchmarking pricing-models of other tools to increase the lock-in effect of users. The underlying reason is that once users already have paid for the product, it relaxes some pressure to quickly come up with updates, which is currently a key challenge due both financial and HR limitations. Furthermore, by using this payment system, revenue is gathered in an early stage which is a necessary to further develop the product offering. Furthermore, the interviewee stated that the Scrum method will be applied more strictly to keep the development on track. Finally, the interviewee stressed that in the short term, a business plan and strategy will be formalized to make the 'picture' more complete and to give more direction.

	KET FINDINGS
STRATEGY (STATUS)	Not formalized
STRATEGIC APPROACH	Technology-driven
STRATEGY TESTING APPROACH	Partially Scrum
TESTING/VALIDATION EFFORTS	Prototype testing by founder himself, market research on existing solutions, gathering feedback on social media, landing page, and Beta-version
MEASUREMENT AREAS	Primarily on product and users.
MEASUREMENTS BY	Functionality of prototype, market research, categorizing feedback from social media, monitoring amount of subscriptions and visitors on landing page, and retention rate on the Beta-version.
BENEFITS	Being the target customer itself, early feedback and subscribers, and broad applicability of product offering.
KEY CHALLENGES	Retaining product development speed—interruption of Sprints, dealing with a great amount of customer feedback, launching sub-elements of the product, limited (financial) resources, lack of own technical knowledge, features in MVP, and revenue-model.
SOLUTIONS	Fast following up of payment-version to Beta-version—keeping the momentum, fixed price, strictly applying Scrum, and making a Business plan and formalizing a strategy.

Table 17: key findings case venture eight

4.2 Cross-Case Analysis

This section of this research paper presents the results of the cross-case analyses. By means of coding, the interview data and resulting codes are grouped into categories which form the structure of this section, i.e. opportunity identification, strategy, strategy validation, measurement, benefits, challenges, and solutions. The cases are labelled as: C1 (HR-Tool), C2 (Strategy Growth Mapping), C3 (Data-Analyser), C4 (Web-Support), C5 (Customer Feedback), C6 (Community Platform), C7 (Crowd-Sourcing Platform), and C8 (Animation-Tool).

4.2.1 Opportunity identification

The first questions were aimed to identify whether strategy testing activities already had been done before starting up the venture. When asked the interviewees what had triggered them to start up their ventures, the answers were given in a very similar fashion. For all cases, the interviewees their own working experiences served as a first identification of the opportunity that they ought to exploit with their start-ups (Table 18). With the HR-Tool, Data-Analyser, Customer Feedback, and Crowd-Resourcing Platform case ventures, the triggers to address certain opportunities were the interviewees their own personal pain. In contrast to the Strategy Growth Mapping and Animation Tool cases where the clients their struggles—pain—were the triggers, and with the other two case venture, Web-Support and Community Platform, were the founders their personal ambitions formed the trigger. Moreover, only case venture six—Community Platform—already had a tested concept before starting up their informal business unit.

Category	Codes	Quotes
Opportunity Identification	Missing element	"Things were getting a little bit boring and monotonous, [], to make it more fun, initially for myself, I had incorporated a variety of game elements within my trainings" (FC1)
	Struggling clients	"During my involvement in the consultancy business I had seen and noticed some interesting things. I noticed that many organizations experience struggles to translate strategy to operations, and that was a trigger for this start-up" (FC2)
	Needs	"I saw this needs from my own personal experience and within the market I was
	from own profession	active in. So, I reasoned that perhaps this needs also exists among other people, and if so, I could solve their problems by applying todays' IT technology" (FC3)
	Exploit ideas	"I was working for my former employer back then, and I felt that I couldn't exploit my own ideas and knowledge as well" (FC4)
	Unclear process	"We experienced that feedback comes from a variety of channels towards the organization, but that there is a lack of a clear process to make a certain person responsible for processing all this feedback" (FC5)
	Do things better	"Due our working experience here we saw some interesting things and opportunities, [], so inspired by what we experienced there, we believed that we could do similar things, but even better" (FC6)
	Need for project facilitation	"When working as free-lancers, me and the other two founders felt the need to have something in place, a platform, to improve cooperation within team- working, and especially, to facilitate the searching process for external team- members" (FC7)
	Client demand	"As a freelance developer, one client demanded a solution to easily make adjustments to his web-page animations. I started to use this tool myself since ever then []" (FC8)

Table 18: Opportunity Identification

4.2.2 Strategy

When taking the business strategies of the case ventures into consideration (table 20), two interesting patterns can be recognized (table 19). Firstly, only three ventures—Strategy Growth Mapping, Community Platform, and Crowd-Resourcing Platform—have formalized their business strategy. Secondly, with the exception of one case venture, all ventures are technology-driven. These ventures

aim to commercialize their technological software solutions in the market. On the contrary, case two— Strategy Growth Mapping—has taken a market-driven approach, where a technological solution is developed to meet existing market demand.

	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8
FORMALIZED		х				х	х	
STRATEGY								
MARKET-DRIVEN		х						
TECHNOLOGY-DRIVEN	x		х	х	х	х	х	х

Table 19: case comparison strategic approaches

Category	Codes	Quotes
Strategy Formulation	Implicit strategy	"I see that implicitly strategy formulation gets shape during our daily routines and has a lead over the formalization of our strategy. However its main elements—capillaries—already exists within our DNA" (FC1)
	Explicit strategy	"We completely work from the Lean Start-up approach with this []. So in this manner we are working on our strategy and to give a concrete answer, the strategy is now placed in our own tool" (FC2).
	Rough Lines	"No not at all, I didn't even made a business plan. [] these are the rough lines I have in mind, I didn't put it explicitly on paper." (FC3)
	Implicit strategy	"We spar about this and consider the pros and cons when deciding to move towards a certain direction. But we don't actually have a logbook where we document all these things" (FC4)
	Seeking for strategy	"We are still in search for the right strategy" (FC5)
	Formalizing strategy	"I have to admit that we haven't done that when we started as a service provider, but for this informal start-up we have focused more on these aspects, [], we try to put this more and more on paper" (FC6)
	Explicit strategy	"Yes, we have the purpose and justification why we exists as a start-up, our targets and goals, and our strategy documented" (FC7)
	Formalizing strategy	"I have to admit that I didn't had a real plan or strategy, but I'm starting to look more into this. Especially, since I realize that it gets a more mature form" (FC8)

Table 20: strategy formulation

4.2.3 Strategy Validation

First Validation

When looking at the first validation efforts that were done by the case ventures (table 22a), an interesting observation can be made. Only two case ventures started with a problem validation, whereas one of these cases did this in a very loosely fashion by merely asking potential customers for their interests without actual testing of their problem hypothesis. All the other case ventures started their validation with a focus on their solution, i.e. product offering.

Validation approach(es)

There exists a clear similarity in the choices for validation and product development, as well as a clear pattern for the approaches which were not applied by the case ventures (table 21 & 22b). Interviewees from seven of the eight case ventures stated that they're applying at least some principles of the Lean Startup methodology. However, six of them merely use the MVP aspect of the LSM, whereas only one case venture—Strategy Growth Mapping—strictly applies all the elements of the LSM, i.e. lean BM canvas, hypothesis validation, and pirate metrics. The Scrum method is applied by six case ventures for product development purposes, where five of the case ventures apply this principle partially or more loosely, i.e. only using Scrum-boards, Product Backlogs, or working in Sprints without strict control of a Product Owner. Finally, two case ventures argued that their strategic plans were also validated due assessments by external parties, i.e. external controllers and external auditors.

	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8
CHECKLIST ASSESSMENT								
PRE-MORTEM ANALYSIS								
INTERACTIVE SIMULATION								
SCRUM	х	х		х		х	х	х
LSM		х						

Table 21: case comparison validation approaches

Category	Codes	Quotes
First Validation (a)	Former colleagues	"Colleagues found it more fun to follow my training programs. So along this way, I came up with the idea to developed a video game, with the purpose of assessing the skills of individuals" (FC1)
	Prior customers' struggles	"We have looked at how goals are determined []. We noticed that this was quite difficult, difficult to do, and then we though that our product can be used to make it easier for the user to formulated good goals" (FC2)
	MVP	"When there came something that worked, although not very good, I had visit accountant agencies and said, well imagine if I make this, would you paid for it, and does it fits your practice? I received positive feedback from those visits []" (FC3)
	Original product	"Like with the web-shop, were we decided to multiply it so that we could offer it to more customers" (FC4)
	Slack community	"We started with validation of the problem, do others perceive the same problem as we did, or are we overreacting with our problem. We predominantly did this in a slack community" (FC5)
	Original product	"We saw that this custom-made platform worked well, especially for the end users, and the customer was very satisfied as well" (FC6)
	Landing page	"The amount of reactions and positive comments we received on our landing page was basically the first validation of our specific plans and product offering" (FC7)
	Prototype	"Although I initially made the proto-type to meet a client's requirement, I was the first tester myself" (FC8)

Table 22a: strategy Validation

	Category	Codes	Quotes
1	Strategy	Partial	"We are using the Scrum method with which we determine each week, or every
	Validation	Scrum	two weeks, what has to be done, and who has to perform which task" (C. 1)
	(b)	MVP	"We work with Minimum Viable Products" (FC1)
		External	"There always follow an extensive set of rounds for external control and supervision
		Controllers	with different advisors to test the hypotheses we made" (FC1)
		LSM	"We completely work from the Lean Startup approach; BM generation, BM canvas,
			and Value Proposition. Consequently, we had built a prototype, or more specific,
			only the mock-ups to illustrate how it would looks like without being able to work.
		-	Then we have used a beta-page and acquired beta-testers" (FC2)
		Scrum	"We do it ourselves, Scrum, we only have reduced the sprint from three weeks to
			one week, to make it more demarcated and clear so that there is no room for
		Na	escape anymore" (FC2)
		NU	No not at all, I didn't even made a business plan. I just paid a x amount of euros to
		approach	"For us there was somehow loss urgansy to do it. Lunderstand that when you need
		approach	over a solution of the solutio
		approach	our case the first year was funded by a partner, so we didn't felt the need to do
			validation and we didn't made a husiness plan either" (FC4)
		MVP	"So by picking out the core, we will be able to deliver a product that satisfies them
			and which is appropriate to be introduced in the market" (FC4)
		Downsized	"We use a, let's say, downsized form of Scrum, which is less structured. We do use
		Scrum	a Scrum-board were we put the things that need to be done during a sprint, [], so
			this is more applied for product development, rather than strategy" (FC 4)
		LSM	"We don't breath the LSM or follow it strictly according to the books. It is more
			something that we are aware of and we apply the principles in our own manner"
			(FC5)
		Kanban	"We are very close to the Kanban-side as well, because we are still very small. What
			we have done so far, is to split up everything we need to do, but we don't put them
			in Sprints. So when a task is finished we start with the following task of the backlog"
			(FC5)
		MVP	"Yes, we are currently building a MVP, and it's almost finished. But with the other
		Dortial	parts of the LSM we are not familiar (FCb)
		Partial	method and recreat it? (ECC)
		Extornal	"There was an external audit and someone who assessed whether the progresses
		Auditors	where based on solid ground" (EC6)
		Partial	"It relates to Agile approaches like Scrum. We use Product Backlogs and work in
		Scrum	sprints although we often use them as guidelines and not always applying them
		Scrum	strictly" (FC7)
		MLP	"We call it a 'Minimum Lovable Product', because we argue that you must at least—
			at a minimum—love it to introduce it on market" (FC7)
		Partially	"I do use elements of Scrum and I work with pull-requests. However, this is more
		Scrum	about making lists by means of a Product Backlog and working in sprints. Although
			I have to admit that the latter is frequently interrupted by side-activities" (FC8)

Table 22b: strategy Validation

Non-applied validation approach(es)

As clearly illustrated in table 21, checklist assessment, Pre-Mortem analysis, and interactive simulations are not used by any of the case venture. Two case ventures used checklists (table 23a), however these were not for strategy testing purposes. The lack of formalized strategies was the main reason given by the interviewees for not using checklists. Pre-Mortem analysis weren't applied either. Finally, interactive simulations weren't performed by any case venture. Interestingly, five of the cases did not use interactive simulations because they did not perceive a high degree of rivalry in their business environment and thus, don't consider interactive simulations as valuable. Three cases had not heard of this approach before, and logically didn't apply this method (Table 23c).

Categories	Codes	Quotes
(No) Checklists (6a)	Checklists channels	"From a book called 'traction' we have selected a couple of channels which can be used to reach your target group and used the checklist provided for these channels" (FC2)
	Pitch checklist	"No, so far the pitch made us. The pitch had fixed elements which has to be crossed-off latterly; financial prognoses, market research, simplified marketing strategy, competitors analysis, so in this respect we did" (FC6)
(No) Pre- Mortem analysis (6b)	Spar Self-critical	"We spar and brainstorm together" (FC1) "I do think that me and the other founder a quite self-critic, even if we consider our own planning, than we often consider the worst case scenario and never the best case scenario" (FC2)
	Vision-session	"Furthermore we have a yearly 'vision-session' where the three of us— founders and accountant—discuss what we want to do for the upcoming one or two years; how are things going, what should be our aim, on which areas should we focus on" (FC4)
	Retrospective intervention	"We have a two week retrospective intervention about what our feelings are, what we have achieved, what could had been better, and from that we make some action points. And with these actions points we continue" (FC5)
	Exit prognosis	"We made an exit prognosis, for 3 years, and we have described what we considered as our weaknesses and strengths, and how we try to deal with those in a wise manner" (FC6)
(no) Interactive Simulation	spar	"I consider us as a niche player, due considering us from the specific combination of gaming and recruitment. Recruitment from this approach is a relative new and unknown market" (FC1)
(6c)	No direct competitors	"The specific thing we do, there is no other party that is focusing on that specific area. Some party offer products with by-products which overlaps the things we do to a certain degree, but not as their primary activity" (FC3)
	Saturated Market	"No never, and to be honest, we merely take competitors into consideration. It's is not that relevant for us, because there are too few parties within our market, our market is not saturated" (FC4)
	Focus on ourselves	"No, we believe that if we spent too much time on competitors we don't spent it on ourselves. So if we would use that approach I think we would pay too much attention to our competitors, and I prefer to improve ourselves, and to focus on our own product" (FC5)
	Entering new 'space'	"It think that role-playing might be more interesting when you enter a new space, when competitors are eager for a position in this. With our situation, we are in quite an established playground, and fortunately, many of the big parties won't be on the radar because our small niche perhaps isn't interesting for them" (FC6)
	No direct competition	"We don't have direct competitors. In addition, we are not a commercial-driven start-up, [], we don't think in terms of rivalry. We are a social-impact start-up that is continuously working on its own mission " (FC7)

Table 23: non-applies validation approaches

4.2.4 Measurement

Table 26 (measurement areas and approaches) gives an overview about the measurement activities and areas the case ventures are focusing on.

Measurement area(s)

When looking at the measurement areas the ventures are focusing on (table 26), there clearly are both similarities and differences (see table 24). What all case ventures have in common, are their measurement efforts on (end) user feedback, revenue numbers, and product development. However, it is remarkable to notice that only three case ventures, Strategy Growth Mapping, Customer Feedback, and Community Platform, also focus on measuring customer—buyers—feedback. The lack of focusing on this important decision-making group as well, might be at the heart of certain struggles the other ventures are experiencing, as will be discussed in the next section. Furthermore, with exception of two ventures—Strategy Growth Mapping and Customer Feedback—, all ventures initially have put a premium on product aspects, rather than validating their customers real problem in advance. In addition, only one venture stated to monitor competitors newsletters and twitter. Finally, the Strategy Growth Mapping case venture focused on additional areas, i.e. all the building blocks of the Lean Business Canvas.

FOCUS ON:	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8
USERS	х	х	х	х	х	х	х	х
CUSTOMERS		х			х	х		
COMPETITORS					х			
PROBLEM		х			х			
PRODUCT	x	х	х	х	х	х	х	х
FINANCE	х	х	х	х	х	х	х	х
OTHER		х						

Table 24: case comparison measurement areas

Measurement approach(es)

This sub-section focuses on the approaches that were taken for measuring purposes (table 25). Firstly, all case ventures perform informal discussions with (potential) users, whereas three of them are conducting formal interviews. Furthermore, interviewees from four case ventures have stated to use the principle of a MVP. However, as discussed in previous section, only one case venture strictly applies the MVP principle and its related hypotheses for actual BM validation. In addition, four case ventures applying variations of MVPs, i.e. MMP, MLP, or simply a basically as possible product.

Principles of Scrum are used by six of the case ventures for product development purposes. Only one case venture—Strategy Growth Mapping—is applying Scrum strictly a stated in the literature. The other five cases show that only certain elements of Scrum are used, or, the Scrum method is not strictly applied, i.e. the missing role of a Product Owner. The remaining two case ventures used a more intuitive approach for their product development. Finally, two ventures did actual testing of their users behaviour and only one case venture applied metrics—pirate metrics—to actively measure patterns in their users behaviour and act upon.

MEASURE BY:	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8
INFORMAL	x	х	х	х	х	х	х	х
DISCUSSIONS								
INTERVIEWS	x	х			х			
MVP	x	х		х		х		
HYPOTHESIS		х			х		х	
SPRINTS	x	х		х		х	х	х
TESTS		х				х		
METRICS		Y						

Table 25: case comparison measurement approaches

Category	Codes	Quotes
Measurement	Assessment rounds	"I'm frequently talking with (potential) customers, not necessarily to discuss the future strategic plan, but to find validation whether there is a need for our product by means of assessment rounds" (FC1)
	Development	"We are using the Scrum method where we determine each week, or every
	progress	two weeks what has to be done, and who has to perform which task" (FC1)
	MVP	"We make use of a MVP to sketch, test, roll-out, and refine" (FC1)
	Interviews	"We also approach a big part of the users and ask them whether they are willing to have a short 15 to 30 minute conversation, and we receive quite a lot of response there" (FC2)
	Feedback	"We have incorporated a chat function within the tool, intercom, and by this
	function	we gather quite a lot of feedback, and we furthermore are able to see how people use the tool" (FC2)
	Mock-up	"We have built a prototype, or more specific only the mock-ups, to illustrate how it would looks like without that it was able to work" (FC2)
	Pirate	"We use a variant of the pirate metrics from Dave McCloure, because these
	metrics	metrics focus on the five phases in the customer file, the pipeline" (FC2)
	User	"Primary with the user, because for me it's important to listen to them and
	feedback	to understand what their needs are. This also makes it more concrete" (FC3)
	Features	only used by one specific party, we eliminate it out of the standardized product" (FC3)
	Revenue	"We do monitor the increase of customers each period, [], and of course
		we measure our revenue" (FC3)
	MVP	"By picking out the core, we will be able to deliver a product that satisfies them and which is appropriate to be introduced into the market" (FC4)
	Feedback button	"We have added a feedback button within the application. And we gather feedback by mailings. It is often sufficient to simply start a conversation, and then we get feedback and suggestions for additional features" (FC4)
	Revenue	"We monitor revenue numbers and we aim for about one-third of growth annually. We achieved this the first year and used it as a benchmark indicator" (FC4)
	Slack	"We have talked with a lot of people, and we have conducted interviews. We
	community	predominantly did this in a slack community" (FC5)
	Public dashboard	"I put the ideas on our public dashboard, and we monitor on which ideas people vote for mostly. based on feedback we want to improve the initial ideas" (ECE)
	Landing page	"We have used a landing page, and still are using it. We didn't used it for testing, but we did some iterations on it to see what happens" (EC5)
	Automatic retention function	"We have an automatic retention function that follows the leavers until they respond. And then we manually approach them" (FC5)
	Subscribing	"We have subscribed on the newsletters of competitors and we keep an eye
	on	on their twitter, so by this means we try to keep an eye on our competitors
	competitors	actions" (FC5)
	Results first customer	"It did worked very well, and nowadays about 50000 people are connected to that. So this community has inspired us to question whether comparable organizations can also make use of this community platform" (EC6)
	External funders	"If more than 200000 euro of people believe in it, then it has to be somehow a good story, otherwise people won't make those investments" (FC6)
	User-testing	"We have one employee who exclusively is concerned with user testing; who demonstrates prototypes and let users perform certain tasks with it. We monitor how well this is done, and what they think of it" (FC6)
	External	"There was an external audit and someone who assessed whether the prognoses we had made where based on solid ground" (EC6)
	Dashboard	"We concretely measure the acquisition of new users, and which of our approaches is most successful for this purpose. Furthermore, we test user

	satisfaction concerning the matching system of our platform. We monitor these numbers by our dashboard" (FC7)
Beta-version	"With our Beta-version, which is based on the principle of a MLP, we test the platform itself and gather insights in the types of usage and whether there is a recurrent pattern" (FC7)"
Social media	"My aim was by means of these posts, and the feedback that comes from it, to see and validate whether the direction I'm going to is the right one"
Landing page	By monitoring the amount of subscribers and requests for a Beta-version on the landing page, I had numbers that justified my decision to continue (FC8)
Beta-version	"For me it is important to let the tool tested by a select group of users to see whether the thing you are making is actually good, both from technological and usability point of view" (FC8)

Table 26: measurement areas and approaches

4.2.5 Benefits

The benefits that were experienced by the interviewees can be sub-categorized into benefits from: Scrum, LSM, MVP, and customer feedback (table 27). The main benefit from applying Scrum principles lies in its contribution to manage the workload and keeping the product development on track. Since only one case venture strictly applies the LSM, while the others merely apply the MVP element of this method, the benefits of the LSM can't be compared. The benefits experienced by case two—Strategy Growth Mapping—are the relatively low costs, demand-driven approach, and the good fit between Lean and software. The usage of MVPs is considered as beneficial, because of its ability to visualize and clarify the intended concepts to (potential) customers. Furthermore, applying the principle of MVPs was considered as extreme valuable by case five—Customer Feedback—since not many resources were wasted when they decided to pivot to another market. Finally, customer feedback is perceived as valuable for giving input to the product development design and product improvements.

Categories	Code	Quote
Benefits Scrum	Manage work	"We are using the Scrum method where we determine each week, or every two weeks what has to be done, and who has to perform which task. By this manner we are able to manage the work better and enhance accountability (FC1)
	Translation by developer	"What I find very interesting about Scrum and Agile is that as a business owner, you can say what your preferences are and that the developer makes the translation" (FC2)
	Eliminate room for escape	"We do it ourselves, Scrum, we only have reduced the sprint from three weeks to one week, to make it more small and clear so that there is no room for escape anymore" (FC2)
	Workload distribution	"We experience it as a clear way to know what to do and to better know what the progress is" (FC4)
	Commitment	"[] because people feel like all their talent is used, and all participants are co- owners which results into extreme commitment and as a result a high level productivity, innovation and flexibility within the organization" (FC7)
Benefits LSM	Relatively low costs	"Well, those are the costs to start with, to be able to do things with relatively low costs""(FC2)
	Demand- driven	"A very interesting phenomenon is that rather than first building a product and then doing marketing activities, basically you now start mostly with doing marketing and assess were the most demand comes from, and the product is steered towards that direction, it is very demand-driven" (FC2)
	Lean/Software fit	"Lean and software development fits each other quite well, I'm not sure whether in other industries or sectors it will fit as good as well, but for software development the LSM is 'the approach' of today's available methods" (FC2)

Benefits MVP	Visualize concept	"When there came something out that worked, although not very good, [], I had something to visualize the concept which was way better than explaining the concept in words to potential customers" (FC3)
	Less ambiguity	"By this we try to avoid that we are blamed for not being able to offer a big solution for low costs. By picking out the core, we will be able to deliver a product that satisfies them and which is appropriate to be introduced into the market" (FC4)
	Product clarification	"By means of a MVP we can give our potential customers a better idea about our product offering which is hard to clarify in words" (FC4)
	Minimalistic product	"During that time there wasn't a real product yet, so not much time and resources were wasted on the product" (FC5)
Benefits customer	Customer feedback	"Sometimes customers come up with very specific problems which forms input for our development process" (FC3)
feedback	Customer feedback	"We experienced the interviews as valuable and it helped us to give shape to our" (FC5)
	Customer feedback	"A substantial part of the strategy is the product-strategy. And we believe that we have validated this because of the big charity customer and a couple of smaller parties we have used this concept for" (FC6)
	Customer feedback	"Yes definitely, we gather user feedback from our measurement which we act upon" (FC7)
	Customer	"Some people had offered some suggestions, tips, and advice how I could do

Table 27: experienced benefits

4.2.6 Challenges

The challenges which were mentioned by the interviewees of the case ventures (Tables 29-33) are categorized into the sub-categories which will be discussed in this paragraph (See table 28).

Product-market fit

Three of the case ventures are struggling to find the right fit between their product offering and the market(s) they approach. Case one—HR-Tool—is faced with the struggle of decision-makers who not yet value the product offering and a misfit between the product's innovation level and the customers' ability to adapt to the product. Case three—Data-Analyser—is confronted with the degree of general applicability of their product offering to make one product that fits all customers. In addition, case five—Customer Feedback—demonstrates a huge dilemma when a pivot to another target market was made when the product development was already in a further stage.

Product-buyers fit

Case venture one—HR-Tool—experiences the dilemma that the product offering makes certain activities of the buyer obsolete and thereby creating resistance towards the product. Case three—Data-Analyser—struggles with long lead-times of the buyers decisions because the product is not critical to them. Case seven—Crowd-Resourcing Platform—has similar struggles due long adaption times of customers to their product offering. Furthermore, both case ventures two and seven—Strategy Growth Mapping and Crowd-Resourcing Platform—are confronted with demand for additional services by their customers. Finally, case venture five—Customer Feedback—is struggling with customers who don't understand how the product is working and are restrained in their information sharing.

Minimum viable product

Seven of the case ventures are struggling with the application of the concept of MVPs. Six case ventures are struggling with the concept of 'minimum', and are inclined to offer more than what is absolutely

necessary to make a learning loop. Reasons for this are: offering nice to have features, to meet at least the competitor's level, generalizability of the product, and features to influence decision-makers buying behaviour. As a consequence, interviewees from three case ventures are struggling whether they should focus on a MLP (lovable) or MMP (Marketable), rather than a MVP.

Pricing model

Two case ventures experiencing struggles to turn potential customers into actual paying customers. Furthermore, the determination of the pricing model is state by four ventures as difficult. As case ventures two and six—Strategy Growth Mapping and Community Platform—point out, the attitude of customers towards software and the expectations of software to be based on a freemium pricing model makes the prince model determination difficult and a potential future tread.

Managing workload

Two case ventures are experiencing challenges with managing the workload. Both case four and five— Web-Support and Customer Feedback—are underestimating the amount of work and are struggling to manage the workload effectively. Case venture eight—Animation Tool—struggles with managing sideactivities due their limited resources and thereby often experiencing interruptions in their Sprints. Case venture six primary experience difficulties with the role and responsibility of the Project Owner when applying the Scrum method. The interviewee argued that in practice, it is often not clear where this responsibility lies.

CHALLENGES	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	CASE 7	CASE 8
PRODUCT-BUYERS FIT	x	х	х		х		х	
PRODUCT-MARKET FIT	x		х		х			
MVP	x	х		х	х	х	х	х
PRICING MODEL		х	х		х	х		х
MANAGING				х	х	х		х
WORKLOAD								

Table 28: case comparison of strategy validation challenges

Category	Codes	Quotes
Challenge	Product-	"We also take over certain activities of the customer-certain HR-activities-
Product-	buyers	and do certain things better than they did themselves, that's not always a well-
Buyers		received consequence" (FC1)
Fit	Additional	"We wanted to focus on product, but demand from the market now is again,
	services	whether we could offer services around the product. But this is lean as well, to come to these kinds of insights" (FC2)
	Product-buyer fit	"It turned out it didn't fit and that I needed to change it. However, we adjusted it which was a continuous process, and still up to today" (FC3)
	Customers' adaption	"What forms the bigger challenge is not out application, but the agency needs the time to change, and needs the time to get knowledge about the application.
process		But it's very difficult for us to influence that process, because you cannot acts as
		a change manager everywhere and telling that they need to do it this way and that way" (FC3)
	Product understanding	"We see that people at this moment are still struggling with understanding how they can work with the product" (FC5)
	Information sharing	"But this is more difficult because the relations are tighter there and the willing to share information is way less" (FC5)
	Customers'	"The adaption speed of our customers for our platform is very low, no matter
	adaption	how much they want it, they can adapt to it for a limit amount. This makes it
	process	difficult for us to visualize certain effects of our platform, because our customers partially use the platform and not in its totality" (FC7)
	Additional services	"We see an additional demand from our customers for chance-consultancy services" (FC7)

Table 29: experienced challenges with Product-Market fit
	Category	Codes	Quotes	
	Challenge Product- Market Fit	Too innovative	"We are mostly awarded (commended) by our users for providing/illustrating a clear impression of the work activities that the candidate eventually will have to perform—it gives a better job preview. I observe that our strategy doesn't match the perception of the clients. Our product is to innovative for the conservative market we serve" (FC1)	
		Product as a goal	"But I can already stress that games are a tool, and never a goal. This might be an area we didn't fully focused/emphasised on lately, and rather treated it like a goal" (FC1)	
		Product-market fit	"Their exists an interesting schism, because the costumers—big organizations—are still working with outdated/aged technology— hardware—and thus making it very difficult for us to run the latest game features/applications on their outdated hardware" (FC1)	
		Listening to customers	"If you only listen to the customers, little information will be gathered since their conservative mind-set. For this reason, I argue to guide your customer in what the future can offer and how to gain a lead, i.e. to educate—guide— your customer" (FC1)	
		General applicability	"It can be the case that we build something and that just a single customers say, okay I really like that feature, while the rest are like, 'what are they talking about', I don't recognise/perceive that problem" (FC3)	
		Target market	"We made a pivot for targeting start-ups towards targeting established organizations, and therefore we currently renewing our platform" (FC5)	
		Loss focus	"When you do custom-made, you become broader and broader and loss the focus" (FC5)	

Table 30: experienced challenges Product-Market fit

	Category	Codes	Quotes
CI	Challenge MVP	MVP	"I think that we are offering to much, which are 'nice to have' for a customer, rather than 'a need to have" (FC1)
		MVP or MLP	"I'm not sure whether it's about MVP or MLP (lovable) product, which questions what is the minimum that makes people enthusiastic, or is it just good enough for not dying" (FC2)
		Decision-making	"So my point is, you not only look at how people use it, but also what they expect and what influences their decision" (FC2)
		MVP	"Yes I do believe in the concept of a MVP, but as product owner you are inclined to get a nice picture, which can also makes you more confident for selling it, but I do think that you can sell without completely finishing it" (FC4)
		MVP/MMP	"Viable in an MVP is a wireframe you can present, and marketable in MMP is a product one can use without that you have to do something with it" (FC5)
		To many features	"Initially we wanted to launch too many integrations, to integrate will all those parties who provide feedback" (FC5)
		Loss focus	"When you do custom-made, you become broader and broader and loss the focus" (FC5)
		MVP	"If we really make an MVP, we are worried because there are competitors in our segment who are a little bit ahead of us, so if you truly make an MVP, do you have something attractive to stand out, to get attention, and if you are really honest, maybe not" (FC5)
		Generalizability product	"In practice we don't re-use that many codes again, so it does is inspired on the concept but the coding, the programming, the architecture is rather different" (FC6)
		MVP/MLP	We call it a 'Minimum Lovable Product', because we argue that you must at least—at a minimum—love it to introduce it on market, i.e. it must take emotional aspects into consideration as well" (FC7)
		MVP	"Sometimes you already have to add features which might not be apparent to users in the early stage, but which will demonstrate their usage when they are in a further stage of their animation development" (FC8)

Table 31: experienced challenges Minimum Viable Product

	Category	Codes	Quotes
C	Challenge Pricing Model	Price erosion	"I see an enormous price erosion, that even when you add much value with your product, it is still expected to be cheap because it is software. So the entire idea of value adding and the price which can be asked for it is quite difficult to find" (FC2)
		Paying customers	"It is way more difficult than expected to let people interacting with the product and frequently, and eventually to let them pay for it" (FC2)
		Lead-time	"Our product enhances efficiency but isn't organizational-critical for our customers, therefore the lead-time for an actual order placement can sometimes take up to six months" (FC3)
		Paying customers	"The people we had interviewed were enthusiastic and the moment we had something that they could actually use, they stepped back" (FC5)
		Pricing model	"So the moment you asked how much they will be willing to pay for that, the answer is almost each time, as less as possible. So this is an aspects we currently are struggling with" (FC5)
		Pricing model	"But if one of the big competitors decides to make it for free than it would be a problem for us, because they already have a big user-base and a part of it are already paying users, and we don't have that yet, so our breath is in that sense shorter" (FC6)
		Price- capability fit	"The more you ask for it will go hand-in-hand with the expectations that comes from it with not only respect to the quality level, but also the speed of updates you have to offer" (FC8)

Table 32: experienced challenges with pricing model

Category	Codes	Quotes
Challenge	Managing	"It often turns out that it takes more time than estimated in advance. So
	workload	perhaps we are a little bit naïve on this aspect" (FC4)
Managing	Sprint	"It is sometimes difficult to make the transition in the right way, because now
workload	interruptions	and then you have the temptation to do something else which is urgent in
		between. This interrupts the sprint, and makes the sprint losses its value" (FC4)
	Managing	"We underestimate the amount of workload, and with Kanban you even get
	workioad	the reeling of, okay i misned a tasks, so i take a break (FCS)
	Product owner	"The problem of project owner, that it isn't clear where this responsibility lies. By the customers or us" (C.6)
	Sprint Interruptions	"Because of limited resources, the Sprints are often interrupted by side- activities related to marketing or interaction with users" (FC8)

Table 33: experienced challenges with managing workload

4.2.7 Solutions

The solutions and actions that were mentioned by the interviewees (table 34) are sub-categorized into: taken actions, and planned actions.

Taken actions

The actions that are taken by the case ventures are aimed at their very specific challenges and struggles, and predominantly concerned with elements of strategy in general. Just a few of the actions are related to strategy testing, although no pattern was identified. As discussed in previous paragraph, the pricing model forms a challenge for various case ventures. Although three cases—Animation Tool, Community Platform, and Data Analyser—have made a deliberate decision to calculate a predetermined price, one case venture—Customer Feedback—has chosen to find the right price due price shooting and is using customers reactions towards the prices as a benchmark for further fine-tuning, i.e. experimenting with the price level and find validation. Furthermore, case five—Customer Feedback—has started a 'proof of concept' experiment to attract more customers and thereby addressing the dilemma of turning potential customers into paying customer. Finally, two case ventures have addressed the confusions concerning MVPs by using derivatives, i.e. MMP and MLP. Both of these variations offer more leeway for features that are not necessarily create value for customers, but which are relevant to influence the decision-making of the (potential) customers.

Planned actions

When asked for the future actions that the interviewees have planned, again very specific actions were mentioned. For this reason, only the following actions are planned for the purpose of strategy testing. Case two—Strategy Growth Mapping—has made a clear decision that no investments will be made until they have validated their product-market hypothesis and have gained better insights into customers behaviour. The interviewee stated that they will continue to apply the LSM strictly, and that they will focus on their pirate metrics. Furthermore, this case venture is planning to incorporate a virtual assistant within its product offering, but first manually will test and validate the added value to customers from this additional service. Finally, case six—Community Platform—is expected to start with A/B testing of their product later this year.

Category	Code	Quote
Taken	Learning	"On one hand it can be frustrating to do things over, on the other hand, these
actions	iterations	iterations are part of LSM" (FC2)
	Monthly fee	"We are moving towards cloud application, and then that's the pricing model. [] so they don't have to think per click about how much that will cost them, it's fixed. This monthly fee was an conscious choice" (FC3)
	One version	"We offer one version, [], otherwise you end up with all different versions that flow through each other, and I don't want that" (FC3)
	Less concepts	"Developing less concepts and only do projects which can be financed ourselves from both product development and marketing point of view (FC4)
	Partnering	[] or to find another party who can do the sales activities" (FC4)
	Scaling	"We only scale when it is required and not because we intended to do" (FC4)
	Market pivot	"Well initially we aimed at start-ups to work for, but we figured out soon that it's more difficult to get 100 start-ups than one big company. So we made some kind of a pivot" (FC5)
	Price model	"We shoot with a certain price, and the moment it is accepted without too much struggle, then we can say, well perhaps we were too low, and along this way we try to improve ourselves" (FC5)
	Proof of concept	"What we currently do with a couple of enterprises is to offer 'a proof of concept' of six months for a fixed price" (FC5)
	Demarcate market	"During the development we have further narrowed the market we want to address than we originally had in mind, so that is something which I think is remarkable. We really focus on the volunteer and NGO market" (FC6)

	Avoid competitors playground	"We have decided to avoid intranet used in profit organizations for now, because we don't want to compete in that segment since we believe that products that are offered in those markets are already too mature to compete with as young product" (FC6)
	Prince model	"We offer open source software by a flavour of freemium, its free but it forces to buy up-dates during the time" (FC6)
	Scrum	"We try to apply a standard scrum method and to respect it. [] if you do it internally, it's more easy to apply scrum because the product owner is more on top of it" (FC6)
	Additional service	"We are currently offering additional services to support our customers in their adaption process to our platform. This is a necessary request from the market because otherwise the organizations are unable to implement it" (FC7)
	Price benchmarking	"I believe that the price can ask is related to your capabilities to meet customer expectations that comes with a certain price level. I used prices for comparable tools as a benchmark" (FC8)
Planned actions	Broadening scope	"We want to zoom in into the process of recruitment and selection of the client and account for a bigger part of this whole process. We want to account for the development of vacancies, recruitment, and selection, and incorporate more social media streams and e-commerce aspects to acquire more candidates for our customers" (FC1)
	Formalizing strategy	"I see that implicitly strategy formulation gets shape during our daily routines and has a lead over the formalization of our strategy. Tomorrow will we formally define the strategy" (FC1)
	Listening to customers	"If you only listen to the customers, little information will be gathered since their conservative mindset. For this reason I argue to guide your customer in what the future can offer and how to gain a lead, to educate—guide—your customer" (FC1)
	Product-market fit	"The first thing we want to achieve is to get the right product-market fit. Only then we might be willing to invest more money to extend the concept" (FC2)
	Metrics	"When it comes to the metrics, we want the entire funnel to be completely clear" (FC2)
	Understand customers behaviour	"Before we have all the numbers in order, and grip on the behaviour of customers, and understanding the behaviour of customers, till than moment we continue in the manner like we do now" (FC2)
	Strict sprint usage	"We need to work with sprints more strictly to tackle our problems of exceeding deadlines" (FC4)
	Scrum	"I think that when we get more people involved in the development side, that it is very useful to commit yourself to this approach, but in case of one developer, it's very difficult to do this" (FC5)
	A/B testing	"If we go life we might want to use A/B testing" (FC6)
	Partnering with	"We don't think in terms of competitiveness. In case there is a party that is
	others	better than us, we will join them and abolish our organization" (FC7)
	strategy	the next step to give ourselves more direction" (FC8)

Table 34: taken & planned actions

5. Conclusion & Discussion

5.1 Conclusion

The aim of this paper was to identify whether organizations test their strategies in advance of implementation, how they perform this activity, and what challenges and benefits they experience. Since academic attention on this specific topic is quite limited compared to other topics within the strategic management domain such as strategy formulation and strategy implementation, this research has taken an exploratory approach by means of a qualitative research design. Guided by the first sub-question, five strategy validation approaches were found in the academic base of knowledge, i.e. checklist assessment, Pre-mortem analysis, interactive simulation, Scrum, and the Lean Startup methodology. The first three approaches lean more towards the deliberate side of the continuum with subsequent focus on assessment against relevant criteria, resilience for hypothetical future occurrences, and interaction with stakeholders within the business environment. The latter two approaches lie more towards the emerging side of the continuum and focus on short iterative and incremental learning cycles, and early customer validation. By means of semi-structured interviews, insights in the practical strategy testing efforts of IT-ventures in their early stages were gathered.

Firstly, only one case venture has taken a market-driven approach, whereas all the other case ventures are technology-driven. These ventures aim to commercialize their technological software solutions into the market, rather than developing a solution for an existing market need. These ventures demonstrate a more built-it-and-they-will-come approach characterised by "cursory research on an opportunity and then focus all of their energy on product development" (Eisenmann et al., 2013, p. 13), i.e. a vision-driven approach. Furthermore, only three case ventures had a formalized strategy at the moment of the interviews. The interview results indicate that the ventures pay limited attention to develop their strategy, i.e. limited efforts for determining a deliberate strategy.

Secondly, only one case venture applies the LSM in accordance to the process identified in the literature review of this paper, whereas the other cases merely using the MVP element. The Scrum framework is used partly or loosely for product development purposes by five case ventures and only applied strictly by one venture. Especially the role and control of a Product Owner, which is a key characterise of the method, is missing in the application of this approach. In addition, none of the other three validation approaches are used for strategy testing purposes, or used at all. The reasons for not applying checklist assessments, Pre-mortem, and interactive simulations are: a lack of a formalized strategy, unfamiliarity with approaches, and a low perceived rivalry within the business environment. Thirdly, with exception of two ventures, all cases initially have put a premium on product aspects, rather than validating their customer's real problem in advance. Moreover, the case ventures demonstrate a poor application of systematic measurements. What all case ventures have in common are their measurement efforts on (end) user feedback, revenue numbers, and product development. However, it is remarkable to notice that only three case ventures also focus on measuring customer buyers—feedback. In addition, one case venture focused on additional areas, i.e. all the building blocks of the Lean Business Canvas. Furthermore, two ventures did actual testing of their users behaviour and only one case venture applied metrics—pirate metrics—to actively measure patterns in their users behaviour and act upon.

Finally, the case analyses identified the following key challenges. Four of the case venture are struggling to find the right fit product-market fit, and three cases are struggling to offer a product that triggers the buyers for adapting the solution. In addition, four cases are struggling to find the right pricing model and two case ventures are experiencing serious problems to turn potential customers into paying customers. The root cause of these struggles presumably can be ascribed to strategy development, or better state, a lack of an extensive strategy development program. Notwithstanding, by having paid more attention to test these strategic elements, the case ventures in questions might had identified these struggles in advance, i.e. in an stage with minimal commitment of resources to a certain decision. Furthermore, the concept of working with MVPs is stated as being confusing because of a tendency to offer nice to have features, to meet at least the competitors level, general applicability of the product, and features to influence decision-makers buying behaviour

Taking previous discussion into retrospect, the central research question about which approach early stage IT-ventures can effectively use to validate their strategies prior to implementation can only be partially answered. The cases from this study clearly indicate a favour for the usage of certain elements of the LSM and Scrum approaches, and an avoidance of the other three approaches. Furthermore, not strictly applying these approaches has also been demonstrated by case ventures to result into various struggles.

6.2 Scientific implications

The contribution of this exploratory research study to the base of knowledge within the domain of strategic management lies in addressing an element—strategy testing—in the strategic management process, which currently has been given less attention than strategy formulation and strategy implementation. Firstly, the process of conducting the literature review was experienced as arbitrary due a lack of papers that compare strategy testing approaches, and a lack of systematic literature review papers on this topic of interest. This paper has made a contribution by systematically comparing five approaches for the purpose of strategy testing. Secondly, academic research is limited on the actual application of strategy testing approaches in practical setting, therefore offering limited empirical evidence and insights concerning the experiences of ventures when applying strategy testing methods. This study gives insights, although for a specific category of ventures—B2B IT-ventures—, about the strategy testing approaches that are favoured for practical application and how they are applied. Based on the findings from this study, these ventures are predominantly driven by vision and technology which is referred by Eisenmann et al. (2013) as a built-it-and-they-will-come approach. In addition, the results indicate that early stage IT-ventures poorly address their strategy development process. Instead of strategy development and strategy testing, the majority of the case ventures were focused on product development and product testing. For this reason, the claim made by Ries (2011) that most start-ups are managed by detailed business plans is not supported. On the contrary, the majority of the case ventures included in this study did not formalized a strategy or made a business plan at all. As a consequence of the predominant approach of starting with execution on an vision idea—, the strategy formulation-to-implementation gap is not apparent. Thirdly, the difficulties when applying Scrum support the statements of Paasivaara et al. (2009) and Schwaber (2004) of the requirement for a skilled Scrum-master, and the difficulties of performing both development and maintenance tasks as argued by Moe et at. (2010). Taking the LSM into consideration, the results support the findings by Harms et al. (2015) and Nirwan and Dhewanto (2015) concerning the difficulties when applying the LSM in B2B context. Indeed, case ventures experienced difficulties with distinctions of user and buyer preferences as indicated by Harms et al. (2015) and the concept of MVPs was identified as a key challenge, which is in line with both Harms et al. (2015) and Nirwan and Dhewanto's (2015) findings. The later challenge has resulted in variants of MVPs, such as MMPs and MLPs. This might be call for refinement of the MVP concept within the Lean Startup methodology. Fourthly, there is a lack of a general framework containing various strategy testing approaches. This exploratory study made a slight contribution. More studies with units of analysis of various business contexts, organizational size, and organization types should be conducted to work towards an overall framework, which eventually should be supported by models and toolkits for practical guidance. Finally, this study demonstrates that the majority of the case ventures aren't systematically testing their strategies. This might be a trigger to include strategy testing into management courses and MBA programs. Moreover, this study invites academics to position strategy testing as an intermediating element between strategy formulation and implementation, rather than performing strategy evaluation as a final phase in the strategic management process.

6.3 Practical implications

This research paper can assist managers and executives to gain insights in strategy testing methods. In addition, strategy testing prior to (full) implementation might provide new insights into factors the organization should take into consideration and makes problems visible, which make strategy makers redefine their strategy into more feasible ones. Moreover, the root cause of some of the identified problems can be ascribed to limited efforts on strategy development, and consequently, limited efforts on strategy testing. This research study might be a trigger for early stage ventures to put more focus on their strategy development process in first place, accompanied by strategy testing activities. Furthermore, strategy testing ought to contribute to more effective strategy implementation, which in turn, can be a competitive advantage itself. Strategy testing can also bring together strategist and implementers in an early stage of the strategic management process. There are three main points of attention which are derived from this study's findings: 1) applying elements of an approach is not the same as applying the approach, 2) strategy is more than a product, and 3) meaningful testing requires measurements.

Firstly, as identified in the case analyses, the majority of the case ventures are applying certain elements of Scrum and the LSM. However, merely using backlogs or working in sprints isn't Scrum, and MVPs aren't the LSM. These are elements of frameworks which are interconnected with other elements. The elements of product owner and daily Scrum meetings are control mechanisms, i.e. those elements make Scrum agile and effective. This might be a profound reason for case ventures to struggle with managing their workload. Likewise, an MVP is an entity for measuring purposes, not the measurement itself. Without hypotheses and measurement procedures, the essence of the LSM—validated learning—is offset.

Secondly, the research findings identified a predominant emphasis on the product offering by the case ventures. However, other elements of strategy should be taken into consideration as well, e.g. available resources, organizational culture, environmental uncertainties, and stakeholders. Primarily focusing on the product might be a tricky approach when it doesn't meet customer needs.

Finally, strategy testing involves measuring. This implies that measurement instruments need to be in place to make testing meaningful. Even though only using a MVP, it requires a measurement instrument to test the effectiveness and consequences of adjustments, otherwise no claim can be made about the criticalness—essentiality—of certain features.

6.4 Limitations & Future Research

It is worth noting that this research study has several limitations as well. Firstly, due the qualitative nature of the research design, the finding will always be prone to subjectivity. Although, the potential bias as a result from variations of the questions between interviewees has been minimalized by means of an interview guide, the data processing might be prone to data processing error, i.e. errors arising from "faulty management of data, in particular, errors in the coding of answers" (Brymann & Bell, 2011, p. 196). This potential bias has been addressed by audio recording of the interviews, rather than exclusively relying on notes, and performing a test-retest method. Nevertheless, the data processingcoding-still relies on the subjective interpretation of the researcher. Furthermore, open interviews were used to avoid the interviewee gets steered in certain direction. Despite the higher degree of leeway for the respondent, the answers might be biased because of sensitivity issues or social desirability. To minimalize this bias, the interviewees were clearly informed about the interview its purpose, i.e. contributing to the base of knowledge within the university of Twente. Secondly, the approaches and results discussed in this study overlap with the research domain of product testing. When considering Scrum from theoretical point of view, one might argue that this approach in essence is oriented on project management for product development, rather than strategy testing. As a result, some of the results discussed in this paper are more related to product testing than strategy testing. Next, the generalizability of the study results can be stated as low for two reasons. Firstly, the units of analysis, although highly comparable with each other, are concentrated within a specific industry, i.e. business-to-business IT-ventures. For this reason, the study results presumably don't apply to other business contexts. Moreover, the approaches taken by the case ventures might be highly influenced by the popularity of certain approaches with their field of expertise. Since Scrum and the LSM find their origins in software development, and the popularity of agile practices within the software development industry, it is reasonable to assume that this is a fundamental cause of the study results, i.e. solely applying principles of Scrum and the LSM. Secondly, the amount of cases is limited. However, this was not a pre-condition since the exploratory nature of the study. Finally, no statements can be made about the effectiveness of certain approaches in the long-term.

To address the shortcoming of this study, further research into the focal research topic is encouraged. Firstly, broadening the research to other units of analysis such as other business contexts, other types of organizations, and organizations in other stages of their life-cycles would enhance the generalizability of the study's results. Consequently, quantitative research is necessary for statistical support of the research findings. Moreover, by means of quantitative research, a larger sample can be included. Secondly, conducting a longitudinal study might result into insight in the long term pay-offs of applying certain approaches.

This study also has raised new questions which future scholars can elaborate on. Firstly, based on the findings of this study, there seems to be a relation between the technology-driven approach, the lack of a formalized strategy, a first validation focused mostly on solution offering, measures primarily on product aspects, and the consequent product-market fit problems. This relation might be interesting to empirically be tested due quantitative research. Moreover, the study results have identified that the majority of the case ventures lack an extensive strategy development process, thereby making strategy testing very difficult as well. Derived from this identification, one might question whether this lack of thinking in strategic terms can be ascribed to the context of the case venture—IT product offering—or to the early stage the case ventures are within. Secondly, the findings of this study identified a low perceptiveness of competitors-rivalry-within the ventures business environment, which was one of the primary reasons for not conducting interactive simulations. It would be interesting to conduct research on the relation between strategy testing approaches and environmental turbulence, e.g. competitive intensity, environmental complexity, instability & volatility, or technology turbulence. Thirdly, two case ventures in this study reasoned that absence of external investors was a reason for not applying a strategy testing approach or formalizing a strategy, whereas one case venture was provoked by external investors to address certain strategic element. Research into the relationship between external funding and the urge for strategy testing might reveal interesting results. Finally, research into the percentage of (Dutch) universities and MBA programs including strategy testing in their courses might reveal one of the underlying reasons why this topic has received limited attention.

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Appendix 1: Interview Guide

TYPE OF QUESTION	SUBTOPIC	QUESTIONS
GENERAL INFORMATION (INTERVIEWEE)	Function & years of involvement within the organization	What is your function within company X? (verification to judge whether this truly is a relevant interviewee for this study). How many years are you involved within the organization?
	Age	What is your age?
	Educational background Working background	What is your educational background? What is your professional background (prior working experience)?
GENERAL INFORMATION (ORGANIZATION)	Origins of idea	How did the venture originated? (In case when the interviewee has been active within the organization since its foundation).
CONTEXT	Target market	What is the target market? Who is the primary customer? How were these determined?
CONTENT	Product offering	What product(s)/service(s) does company X offers? What is the value for customers by offering this product/service?
CONTEXT	Business context	In what business environment is company x active?
	Stratogy	What is stratogy means to you?
PROCESS	Strategy conceptualization, Strategy formulation, & Strategy definition	How was the strategy formulated within company X? Who were/are involved in this process? What tools have been used? How would you define company X's strategy?
		What makes this strategy sustainable?
	Strategy formulation-to- implementation gap	Was the strategy first formulated and then implemented, or reversed? Why, in this manner? How is the strategy implemented? (Incremental)
	Strategy validation/testing	Has the strategy been tested—validated—prior to (full) implementation*? If yes, how? By what approach(s)? Why is this approach chosen? How is this experienced? (Were there particular difficulties along the way?) What were the results? What actions have been made? How frequently is this activity performed? (one- time event, periodically, continuously) *If no, continue to next section to assess whether the company did or did not made implicitly validation efforts on certain key aspects.

CONTENT & PROCESS		Why not using a testing/validation method? (lack of familiarity with the topic, confidence in the plan, lack of time) What has been done to assess/estimate the likelihood of strategic success?
	Product-Solution fit (Checklists, LSM)	How was the problem-solution fit validated?
	Product-Market fit (Checklists, LSM)	How was the product-market fit validated? How did you validated the need for the product offering from customers?
	Resource/Strategy fit (Checklists, LSM)	How is alignment between the resources of company x, and the intended strategy validated?
	Considering the future (interactive simulation)	How did the strategy incorporates future uncertainties with respect to: competition, customers, economic conditions, regulations?
	Revenue model (LSM)	How was the revenue model validated? (how did you knew that customers were willing to pay this amount of money for the product/service?
	Incremental learning (LSM, Scrum)	Where is the organization now?
	Sustainability (Checklist)	How is the strategy protected concerning competition?
	Separation from competitors (Checklist)	What makes company X unique? How is this validated? (market research, customer feedback?)
	Role-playing (Interactive simulation)	From which angles/perspectives is the strategy perceived?
	Back-up plan (Pre-Mortem)	What has been done to anticipate strategic failure?
CONTENT & PROCESS	Measuring & Monitoring Progress	How is progress measure with respect to strategic initiatives? Are critical performance indicators determined? What is measured?
	Business plan, Estimates, & Evaluation	Was there a business plan in advance? Were prognoses (estimates) made for organizational performances? If yes, How would you assess the performance of company X, in respect to these estimates? How would you declare the performance? Did it meet the expectations/estimates? Why or why not?
	Testing approaches (explicitly)	Were checklists used? Were brainstorm-sessions conducted to think about potential flaws in the strategy? (Pre- Mortem) Has role-playing been used? (Interactive- simulation)?

		Was the strategy implemented by incremental steps? (Scrum) Was the strategy formulated and/or implemented by incremental steps based on a minimum amount of effort? (Lean Startup)
CONTENT	Looking at the future	What will be the next steps with respect to strategic initiatives?
GENERAL	Round off	Does the interviewee has final remarks concerning the topic of this interview? Does the interviewee has final remarks concerning the interview? If not, then declare the end of the interview and thank the interviewee for his/hers participation, time, and knowledge sharing in name of the student and the University of Twente

Table 35: Interview Guide