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Cross-functional collaboration in high-tech startups pursuing the
lean startup strategy

An explorative case study of two high-tech startups

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Abstract

The research presented in this thesis is focused on high-tech startups pursuing a strategy referred to as the “lean startup concept”. In order for this concept to be effective, cross-functional collaboration between marketers and engineers is required. However, such collaboration is, according to much research, far from unproblematic, as many studies show that the two professions find it difficult to cooperate.

In light of such alleged collaborative difficulties put together with the need for cross-functional efforts required by the lean startup approach, the purpose of this thesis is to identify factors that influence the cross-functional collaboration achieved between marketers and engineers. We have fulfilled this purpose through conducting case studies in two Swedish high-tech startups, which are pursuing the lean startup strategy.

Our findings suggest that it is important for lean high-tech startups that seek to improve their cross-functional collaboration to be explicit about the value of integration and functional interdependencies. Furthermore, efforts should be directed towards making the employees understand each others’ viewpoints and allowing them to take part in decision-making and organizational planning. Moreover, another important factor that contributes to cross-functional collaboration is communication. Finally, we conclude that the lean startup approach not only requires cross-functional collaboration, but also facilitates it, especially when applied in a firm employing a relatively small number of people.

The findings of this thesis contribute to research in the form of a framework that can be used to identify factors that influence the cross-functional collaboration achieved in startups pursuing lean.

Key words: cross-functional collaboration, cross-functional integration, cross-functional interaction, lean startup concept, marketing-engineering collaboration, high-tech startup.

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Abbreviations

CEO – Chief Executive Officer

CIT – Critical Incident Technique

CPO – Chief Product Officer

CTO - Chief Technology Officer

MVP – minimum viable product

NPD – new product development

Table of contents

ABSTRACT	2
ACKNOWLEDGEMENTS	3
ABBREVIATIONS	4
TABLE OF CONTENTS	5
1 INTRODUCTION	8
1.1 PROBLEM	9
1.2 PURPOSE	9
1.3 RESEARCH QUESTION	10
1.4 DISPOSITION	10
2 DEFINITIONS	10
2.1 DEFINING CROSS-FUNCTIONAL COLLABORATION	10
2.2 DEFINING MARKETERS AND ENGINEERS	11
3 INTRODUCTION OF THE LEAN STARTUP CONCEPT	12
3.1.1 THE BUILD-MEASURE-LEARN FEEDBACK LOOP AND THE ROLE OF THE MVP	12
3.1.2 THE ROLE OF INNOVATION ACCOUNTING IN THE MEASUREMENT PROCESS	14
4 PREVIOUS RESEARCH	15
4.1 SEARCH METHOD	15
TABLE 1: SEARCH KEY WORDS	16
4.2 SUMMARY OF SEARCH RESULTS	16
4.3 CONTRIBUTION TO RESEARCH	17
5 THEORETICAL FRAMEWORK	18
5.1 THEORY SELECTION PROCESS	18
5.2 A CONCEPTUAL FRAMEWORK FOR STUDYING ENGINEERING-MARKETING INTEGRATION	20
5.2.1 DETERMINANTS OF HOW MUCH INTEGRATION IS REQUIRED	20
5.2.2 DETERMINANTS OF HOW MUCH INTEGRATION IS ACHIEVED	21
5.2.3 THE INTEGRATION GAP AND INNOVATION SUCCESS	22
5.2.4 WHY THE FRAMEWORK WAS SELECTED	22
5.3 A PRACTICAL FRAMEWORK FOR CREATING EFFECTIVE TEAMS	23
5.3.1 THE ROLE OF THE ORGANIZATION IN CREATING EFFECTIVE TEAMS	23
5.3.2 WHY THE FRAMEWORK WAS SELECTED	24
5.4 A COMPREHENSIVE FRAMEWORK FOR ACHIEVING SUCCESSFUL ENGINEERING-MARKETING INTEGRATION	24
5.4.1 WHY THE FRAMEWORK WAS SELECTED	25
5.5 OUR THEORETICAL FRAMEWORK	26
5.5.1 THE APPLICATION OF THE THEORETICAL FRAMEWORK	27
6 METHODOLOGY	28

6.1	CASE STUDY APPROACH	28
6.1.1	SELECTION OF CASE STUDY COMPANIES	28
6.1.2	INTERACTION WITH CASE STUDY COMPANIES	30
6.2	DATA GATHERING	30
6.2.1	PROCESS OF DATA GATHERING	30
6.2.2	CRITICAL INCIDENT TECHNIQUE	31
6.3	THE OVERVIEW OF THE INTERVIEWS	35
6.4	DATA PROCESSING	37
6.4.1	STRUCTURING THE DATA ACCORDING TO THE THEORETICAL FRAMEWORKS	37
6.4.2	CIT INTERVIEW ANALYSIS	38
6.5	OTHER POTENTIALLY APPLICABLE DATA GATHERING TECHNIQUES	38
6.6	LIMITATIONS	39
6.7	METHODOLOGICAL ISSUES	39
6.8	RELIABILITY AND VALIDITY	41
6.9	DEVIATIONS	41
6.10	GENERALIZABILITY	42
6.11	ETHICAL CONSIDERATIONS	42
7	RESULTS	43
7.1	INTERVIEWS AT SALTONSOFT	43
7.1.1	PRESENTATION OF SALTONSOFT	43
7.1.2	THE CRITICAL INCIDENTS AT SALTONSOFT	47
7.2	INTERVIEWS AT TRUECALLER	56
7.2.1	PRESENTATION OF TRUECALLER	56
7.2.2	THE CRITICAL INCIDENTS AT TRUECALLER	60
8	ANALYSIS	64
8.1	IDENTIFYING FACTORS INFLUENCING THE MARKETING-ENGINEERING INTEGRATION	64
8.2	FACTORS IDENTIFIED THAT CAN BE CLASSIFIED ACCORDING TO THE FIRST PART OF OUR THEORETICAL FRAMEWORK	65
8.3	FACTORS IDENTIFIED THAT CAN BE CLASSIFIED ACCORDING TO THE SECOND PART OF OUR THEORETICAL FRAMEWORK	72
8.4	FACTORS IDENTIFIED THAT CAN BE CLASSIFIED ACCORDING TO THE THIRD PART OF OUR THEORETICAL FRAMEWORK	76
8.5	ADDITIONAL FACTORS	79
8.6	COMBINING THE IDENTIFIED FACTORS INTO A FRAMEWORK	80
9	DISCUSSION	81
10	CONCLUSIONS	83
10.1	THEORETICAL IMPLICATIONS	87
10.2	PRACTICAL IMPLICATIONS	88
10.3	LIMITATIONS AND AVENUES FOR FURTHER RESEARCH	90
11	REFERENCES	91
12	APPENDICES	95
12.1	QUESTIONS PROTOCOL	95
12.1.1	GENERAL INTERVIEWS	95
12.1.2	INTERVIEWS ABOUT LEAN PROCESSES	95

12.1.3	CIT	96
12.2	LIST OF INTERVIEWS	97
12.3	GROUPING OF IDENTIFIED FACTORS	98

1 Introduction

The management literature offers a broad range of concepts claimed to lead to operational excellence when successfully implemented (Slack et al., 2009). One, relatively new and unexplored, such concept is called “The Lean Startup”, founded and introduced by IT entrepreneur Eric Ries (Ries, 2011). The story behind the emergence of the concept has its roots in Ries’ personal experiences from the software industry, as he kept on seeing products, in which he had invested a lot of hard work, fail in the market place. The low-hanging-fruit explanation appeared to be that the technical solutions were not advanced enough, requiring more engineering effort and a higher degree of technical sophistication. However, when Ries and his colleagues implemented such “improvements”, to their surprise, the products became even less attractive in the eyes of the customers. It was first when Eric Ries was involved in a startup called IMVU that it finally dawned on him that, instead of perfecting technology from the perspective of what the engineers *think* the customers want, startup companies should build a minimum viable product (MVP) to be shared with the target market at an early stage to *learn* what the customers *actually* want. The IMVU became a success story, which, in Ries’ opinion, appeared to have several touch points with traditional lean production, defined as the philosophy of meeting demand instantaneously, with perfect quality and no waste (Slack et al., 2009). According to Ries, the lean concept – with a few alterations – could be used to explain the success at IMVU and as a result, the lean startup concept was born. Today the practical application of the lean startup approach has grown beyond its roots in the highly technological industry and can be found in most industries (Ries, 2011).

At the core of the lean startup concept is the “Build-Measure-Learn Feedback Loop”, aimed at eliminating waste associated with building products without commercial viability, a process that is described in detail later on. In order for lean startup firms to create an effective feedback loop, cross-functional collaboration between marketers and engineers is required, since efforts should be directed at minimizing the *total* time products spend in the loop rather than on optimizing its specific parts. Through the employment of cross-functional teamwork, input from both product development and marketing is provided at all stages of the loop, which speeds up the throughput time (Ries, 2011).

However, such cross-functional collaboration is, according to much research, far from unproblematic (see the “Previous research” section). On the contrary, several studies show

that the marketing and engineering functions tend to experience collaborative difficulties and engage in ineffective struggles for power (Weinrauch and Anderson, 1982; Lam and Chin, 2005; Ayers et al., 1997). One cause of the difficulties in cooperation is argued to be that both marketers and engineers play key roles in the product development process, whereby they focus on different aspects of the task at hand (Ruekert and Walker, 1987). If generalizing, marketers are primarily more concerned with identifying customer preferences, catering to them and fending off competitive threats, whereas engineers are occupied with achieving technical excellence and ensuring its feasibility. These different perspectives may potentially result in conflicting objectives and struggles for influence, where pursuit of technological sophistication on part of the engineers clashes with the marketers desire to maximize the company's market share (Ruekert and Walker, 1987).

1.1 Problem

In light of the collaborative difficulties described above put together with the aforementioned claim that the lean startup approach requires cross-functional collaboration (Ries, 2011), one might wonder, how lean startups achieve sufficient marketing-engineering integration? We find this question intriguing and, therefore, in this thesis we are aiming to identify factors that are influencing the cross-functional collaboration achieved between marketers and engineers in highly technological startup companies (hereinafter high-tech startups), which are pursuing the lean startup strategy. Thus, we are examining the relatively well-explored topic of cross-functional marketing-engineering collaboration, within the relatively unexplored lean startup setting.

This research problem is highly relevant not only for high-tech startups currently pursuing lean, but also for other startups employing several functional groups (such as marketing and engineering in our case) and seeking effective cross-functional collaboration.

1.2 Purpose

Following from the problem description, the purpose of this thesis is to identify factors that are influencing the collaboration achieved between marketers and engineers in the lean high-tech startup context. Upon having identified the factors, we are going to summarize our findings in the form of a framework. Thus, we aim to contribute to the theoretical field of cross-functional collaboration by developing a framework that can be used to identify factors influencing cross-functional collaboration in startups pursuing lean.

1.3 Research question

Based on the considerations that we have presented so far, the overarching research question that we intend to answer is:

Which factors influence the cross-functional collaboration achieved by high-tech startups pursuing the lean startup concept?

1.4 Disposition

The remaining part of this thesis is divided into the following main sections:

- i. Definitions
- ii. Presentation of the lean startup concept
- iii. Previous Research
- iv. Theoretical framework
- v. Methodology
- vi. Results
- vii. Analysis
- viii. Discussion
- ix. Conclusion

Each section begins with a short introduction aimed at providing the reader with a content overview and, thus, also at facilitating the reading process.

2 Definitions

Since some of the central terms dealt with in this thesis lack clear objective definitions, we have chosen to devote this section to clarify our understanding of the terms “Cross-Functional Collaboration”, “Marketers” and “Engineers”.

2.1 Defining Cross-Functional Collaboration

In this thesis we have chosen to base our definition of cross-functional collaboration on a very simple description of the term collaboration, provided by businessdictionary.com:

“Collaboration is a cooperative arrangement, in which two or more parties work jointly towards a common goal” (Businessdictionary.com, 2013).

Through modifying and extending this definition in a pursuit of making it fit the purpose of our thesis, we arrive at the following cross-functional collaboration definition:

Cross-functional collaboration in a high-tech startup is a cooperative arrangement, in which marketers and engineers work jointly towards a common goal within product development.

We find this broad and simple definition suitable, as we do not intend to research, what cross-functional collaboration entails. Instead we assume that our case companies employ both marketers and engineers, who work together in the product development process to achieve the goals of the startup firm, i.e. we assume, in accordance with the definition given above, that they pursue cross-functional collaboration.

For the purpose of this thesis, we have decided to use the terms “collaboration”, “integration” and “interaction” synonymously.

2.2 Defining Marketers and Engineers

As the companies participating in this study are relatively young and undeveloped, they have no clear division into specialized departments, such as “marketing department” or “product development department”. Therefore, we find it important to explain, how we have classified marketers and engineers.

According to David Jobber, the modern marketing concept can be expressed as:

“The achievement of corporate goals through meeting and exceeding customer needs and expectations” (Jobber, 2007, p. 5).

This definition suggests that the responsibility for implementing the marketing concept relies on integrated firm efforts and not just on the marketing department. However, for the purpose of this thesis we need to deviate from this holistic perspective on marketing and treat the marketers as an isolate group of employees. Since our research objects, as mentioned before, are startups, they do not yet employ multiple competences and have no official departments (Interview with Saltonsoft’s founders, 2013-01-15). Therefore, their employees can roughly be divided into two segments:

Segment 1: The employees, who develop the actual product and who bear the practical responsibility for incorporating the customer feedback collected in accordance with the lean startup approach into the product development process.

Segment 2: The employees, who are responsible for marketing the product to stakeholders (mostly investors and customers) and who bear the responsibility for collecting, interpreting

and forwarding the customer feedback collected in accordance with the lean startup approach to the employees in segment 1.

Our definition of marketers in this thesis is, therefore, the following:

Employees, whose primary responsibility is to market the product to stakeholders and to collect, interpret and forward customer feedback to product development without becoming actively involved in technically constructing the product on basis of the feedback.

Following from our definition of marketers, engineers can be defined as:

Employees, whose primary responsibility is to technically construct the product on basis of the customer feedback, without actively collecting, interpreting and forwarding this feedback.

We would also like to point out that we will use the terms “engineers” and “developers” synonymously, as our research objects tend to define themselves as developers rather than engineers.

3 Introduction of the lean startup concept

The context of this research is a lean startup environment, which makes it necessary to provide the reader with a basic understanding of the lean startup concept. In the following we will explain why, how and when cross-functional collaboration between marketers and engineers is required in startups pursuing lean. The reason, why we have chosen to present the lean startup approach according to Eric Ries, stems from the fact that our case companies apply his definition in their execution of the concept.

3.1.1 The Build-Measure-Learn Feedback Loop and the role of the MVP

The main idea behind the lean startup concept is to test fundamental business hypotheses through building MVPs to be shared with prospective customers at an early stage of product development. The building of such MVP is claimed to be the fastest way to go through the Build-Measure-Learn Feedback Loop, given that marketers and engineers collectively get involved from the very beginning of the loop (Ries, 2011).

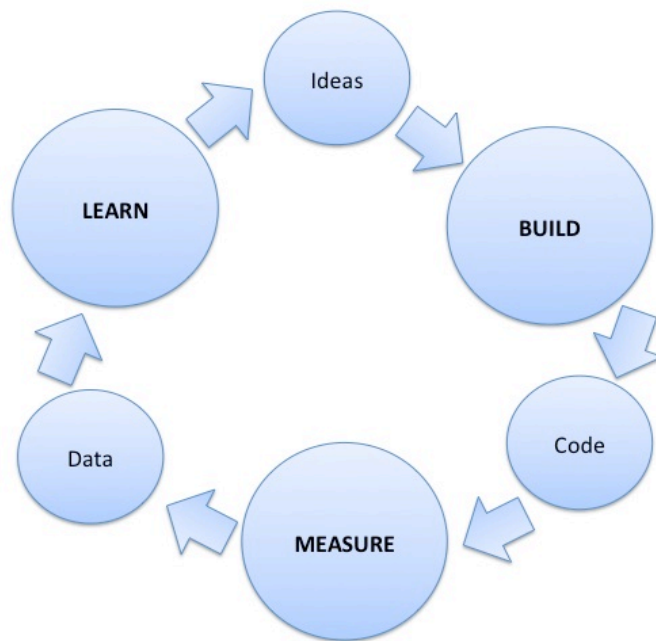


Figure 1: The Build-Measure-Learn Feedback Loop

Before entering this loop, entrepreneurs must start off by identifying two hypotheses to be tested by the MVP: one concerning value potential and the other one concerning growth potential. The hypotheses are referred to as “leap-of-faith assumptions”, upon which the whole business idea depends. Once these assumptions have been established, the building phase is entered through the creation of the MVP, which is not supposed to be technologically perfect. On the contrary, it targets early adopters, who are claimed to become suspicious if the features of the product appear too “polished”. The ground rule is that the MVP should be as simple as possible, where additional work beyond what is required to start learning is considered as wasteful activities (Ries, 2011).

When the MVP is completed, it goes into the measurement phase, where its commercial viability is determined through testing the hypotheses in the market. If the hypotheses prove to be false, i.e. if the customers are not reacting in favourable way towards the MVP, alterations to it have to be made in order to test a new hypothesis. This last step is all about “validated learning”, which, according to Ries, is different compared to “normal” learning: Ries believes that “normal” learning tends to become an excuse for executing failures. This means that entrepreneurs, who do not reach their intended results, claim that, at least, they “learned something,” which Ries finds an after-the-fact rationalization aimed at mitigating

the failure. Validated learning, on the contrary, is a method for demonstrating progress backed up by empirical data collected from real customers (Ries, 2011).

The result of the feedback loop approach is that, by the time the product is ready to be introduced to a broader market, it has already established proof of concept. However, for the build-measure-learn process to work properly, engineers and marketers need to collaborate closely, in terms of constantly exchanging information, experiences and perspectives (Ries, 2011).

3.1.2 The role of Innovation Accounting in the measurement process

Eric Ries argues that standard accounting is not suitable when evaluating entrepreneurial efforts, as startups are associated with uncertainty that makes financial predictions too unreliable. For this reason he claims that lean startups need to apply a different kind of accounting referred to as “Innovation Accounting” that can be divided into three steps aimed at testing a hypothesis iteratively (Ries, 2011):

1. *Establish the baseline:* Use the MVP to determine customers’ reaction to the product in the current development stage and to test leap-of-faith assumptions. This part of innovation accounting is highly dependent on cross-functional efforts.
2. *Tuning the operations:* Once the base line is established, startups must begin to fine-tune their operations.
3. *Pivot or Preserve:* Once all changes are made in the pursuit of fine-tuning the operations, the company must make a decision: preserve or pivot. If the company is making progress toward its ideal state, that is, if it is learning and using the learning effectively, it makes sense to preserve. Preserving is, therefore, synonymous with continuing on the chosen track. If this is not the case, the company must realize that its product strategy is flawed and change direction.

Pivot can, according to Ries, be defined as a special kind of structured change designed to test a new fundamental hypothesis about the product and the business model. This is at the heart of the lean startup concept, as it is what makes the lean startups good at facing and managing mistakes, which is illustrated by the following quote from the book written by Ries:

“If we take the wrong turn, we have the tools we need to realize it and the agility to find another path” (Ries, 2011, p. 176).

In sum, one can say that the question of preserving or pivoting is basically the same as deciding, whether the initial hypothesis is correct or wrong. To pivot means, consequently, to develop a new fundamental hypothesis to test. This part of the innovation accounting process is dependent on human judgement, as there is no way to develop a clinical formula for making pivot or preserve decisions. At the same time, innovation accounting per se is a helpful tool when it comes to making the decision, as it ensures that there is relevant data available when the company reaches the point of decision. Once again, cross-functional team efforts are a prerequisite for the effectiveness of the innovation accounting process (Ries, 2011).

4 Previous research

The collaboration between marketers and engineers has been the topic of many research articles and, thus, is well explored. In this section, we will outline the types of studies previously conducted within the field of marketing-engineering collaboration and use this outline in the pursuit of explaining, which literature gap we are bridging in our research.

4.1 Search method

In order to get a thorough understanding of the studies previously carried out within our research area, we used different key word combinations (see table below) to search in the biggest scientific databases. The searches delivered a multitude of results. However, we found it neither possible, nor necessary, to go through all of them due to their decreasing relevance. For this reason, we only looked at the results displayed on the first 3 to 4 pages, which accounted for about 60-80 articles for each key word combination (20 per page). This limitation appeared adequate, as, in our opinion, the results became increasingly far-fetched the higher the page numbers. The 60-80 search results in each search word category were then skimmed through in the pursuit of identifying the articles at least relatively close to our research topic.

Search key words	Total search results, #
marketing engineering	59325
marketing engineering integration	20900
cross-functional collaboration product development	20300
product development cross-functional collaboration	20300
marketing engineering collaboration	11250
lean implementation challenges	7375
innovation marketing r&d collaboration	6650
cross-functional collaboration lean	2025

Search key words	Total search results, #
lean startup	900
cross-functional collaboration marketing engineering lean	625
startup innovation cross-functional collaboration	325

Table 1: Search key words

4.2 Summary of search results

As we do not find it relevant to outline all the articles on cross-functional collaboration, displayed on the first 3 to 4 pages that were, nevertheless, dropped in the skimming process, we will instead focus on the previous research papers that we found relatively close to our research topic. This literature accounts for the articles we have read more carefully in order to understand and to be able to motivate the gap our study is bridging.

One of the first things we noticed when reading the papers was that many of the articles on cross-functional teams presuppose that marketers and engineers find it very difficult to collaborate. This implies that managing the collaboration is perceived as synonymous with managing severe problems or even cross-functional conflicts. For example, Robert Ruekert and Orville Walker conducted an exploratory study based on data drawn from three divisions of a Fortune 500 industrial products manufacturer (Rueckert and Walker, 1987). The main objectives of the study were to examine the amount of conflict between marketing and R&D personnel, the organizational structures used to reduce them and their impacts on the effectiveness of the inter-functional relationship between marketing and R&D (Ruekert and Walker, 1987). Another example is a study conducted by Susan M. Keaveney with the aim of shedding light on causes of conflict and possible solutions applicable for cross-functional teams (Keaveney, 2008). A third example is two studies conducted by Vivienne and Christopher Shaw, where, among other factors, differences in expectations together with poor communication were claimed to result in interdepartmental conflicts (Shaw and Shaw, 1998; Shaw and Shaw, 2000). In sum, what the conflict-oriented studies have in common is that they focus on finding conflicts to be studied in terms of causes and mitigation strategies and that they suggest cross-functional communication and co-location as ways to reduce conflicts.

A related category of research involves articles that, although not explicitly discussing conflict issues between the two professions, still focus on prevalence of different types of collaborative problems, one example of which is William E. Souder's article (Souder, 1988). This article contains a number of recommendations on how to improve the marketing-R&D

interface under the assumption that integration per definition is problematic. Another research with the same focal point was conducted by Lena Karlsson et al. (Karlsson et al., 2002). The common denominator with regards to the two articles is, again, the suggestion of enhancing communication between the two professions in pursuit of successful product launch.

Another prominent theme in the previous literature on cross-functional collaboration between marketers and engineers is how to make the “optimal” investment in cross-functional teamwork – a research question based on the assumption that cross-functional teams incur costs. For example, Gerda Gemser and Mark Leenders claim that certain companies should not invest heavily in cross-functional teams from a monetary perspective. Instead, cross-functional team investments are likely to render high pay-offs only in NPD projects, where the risk is high (Gemser and Leenders, 2011). The same topic is discussed in the article by Maarten Cuijpersa et al., where organizational information processing theory is used to build and test hypotheses on the costs and benefits of different kinds of cross-functional collaboration (Cuijpersa et al., 2010). The common finding of articles on this theme is that cross-functional teamwork is not always worth investing in, but that the investment decisions should be context-specific.

Moreover, other types of studies have an explicit marketing focus (Atuahene-Gima and De Luca, 2008; Hirunyawipada et al., 2009). One such example is an article written by Dennis J. Cahill et al., where the usefulness of the marketing concept is discussed in relation to high-tech NPD (Cahill et al., 1994). Another similar study was conducted by Matti J. Haverila, where he identified marketing method variables associated with successful versus unsuccessful attempts to enter the international marketplace (Haverila, 2013).

A common denominator in the majority of the studies we have taken note of is that they have been conducted within large, mature organizations. What is more, none of them have taken place in a lean setting, which we find surprising, given that the lean concept requires cross-functional collaboration between the product development department and the marketing department.

4.3 Contribution to research

We have not found any study that is identifying factors that influence the marketing-engineering integration achieved by small high-tech startups pursuing the lean startup

strategy. Therefore, we intend to contribute to the theoretical field of cross-functional integration by developing a framework that can be used to identify factors influencing cross-functional collaboration in startups pursuing lean.

5 Theoretical framework

The main purpose of this section is to present our theoretical framework and to explain how it has been used in the context of this thesis. Moreover, we have also decided to outline, in brief, the selection process for arriving at the framework and, thus, clarify, why other presumably applicable theories have been excluded.

5.1 Theory selection process

Our theory selection process started out with listing theories and frameworks potentially applicable in the context of our research. The list was then organized into broad categories (see table below), from which we finally selected three frameworks that we found relevant for our research and that we – with some alterations – synthesized into one theoretical framework presented at the end of this section.

Theoretical category	Example of theory within the category	Selected?	Why it was considered?	Why it was excluded/selected?
Conflict management theories	Jeffer Pfeffer's model for producing the use of power and politics	No	Many previous research articles on cross-functional collaboration assume conflict.	We focus on finding factors influencing the collaboration without assuming that conflict inevitably arises.
Cross-functional collaboration theories	Ashok Gupta, S. P. Raj and David Wilemon's framework for studying R&D-Marketing interface in the product innovation process	Yes	Although this model is not explicitly targeted at lean startups, it is very relevant, since the factors identified in the framework are in line with the purpose of our research.	This framework proved to be very useful for classifying the interview data.
	Steven Wheelwright and Kim Clark's framework for Revolutionizing product development	Yes	Our research objects are lean startups and require close and effective collaboration between marketers and engineers.	This framework proved to be very useful for classifying the interview data.
Effective team theories	Susan Wheelan's framework for effective teams	Yes	Same as above	Same as above
Structural theories	Henry Mintzberg's structural configurations	No	The collaborative issues can presumably be placed in a "Professional Bureaucracy", where professions find it hard to cooperate.	A startup can never be claimed to be a professional bureaucracy.
The lean startup concept	Eric Ries' lean startup concept	No	We are investigating the collaboration in a lean startup setting.	The concept is presented in a previous section with the aim of explaining why, how and when collaboration is required in lean startups. Lean is the setting in which the research question arises, but will not be used in a pursuit of answering it.
Traditional lean concept	Pär Åhlström and Niklas Modig's book "This is lean"	No	Traditional lean partly inspired the lean startup concept.	We found no use for the traditional lean approach in this thesis, as it deviates a lot from the lean startup concept.

Table 2: List of potentially applicable theories and frameworks in an alphabetical order.

5.2 A conceptual framework for studying engineering-marketing integration

Gupta et al. have developed a conceptual framework for studying engineering-marketing integration in the innovation process. The framework is based on a synthesis of the literature from diverse fields of study. What it proposes is that the strategy of the firm, together with how it perceives environmental uncertainty, can influence the perceived need for engineering-marketing integration. At the same time, the level of integration actually achieved by a firm depends on organizational and individual factors. Finally, the framework suggests that the gap between the level of integration needed and the degree of integration actually achieved can influence the innovation success (Gupta et al., 1986).

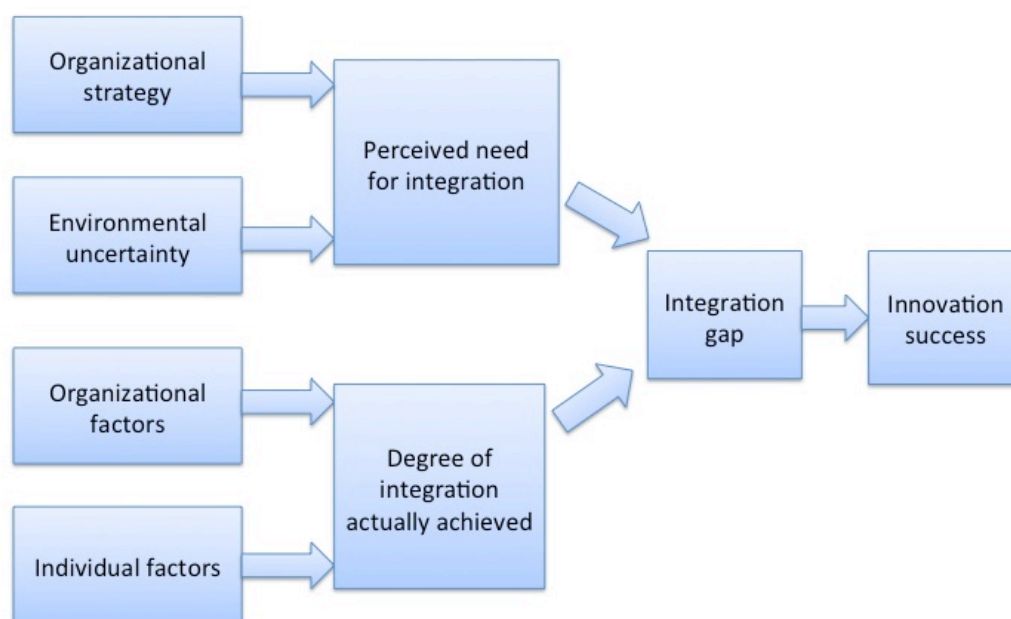


Figure 2: The conceptual framework for the study of engineer-marketing integration

5.2.1 Determinants of how much integration is required

Organizational strategy

Gupta et al. believe that, from a strategic point of view, the need for cross-functional integration between marketers and engineers will decline along a prospector-reactor continuum, where being a prospector involves entering new markets and/or launching new products with unfamiliar technology. This strategy demands a relatively great need of information processing, which requires cross-functional efforts. The other extreme, the reactor, operates with proven technology in familiar markets. For this reason, reactors experience a relatively smaller need of information processing and, thus, require less cross-functional efforts.

Environmental uncertainty

The greater the environmental uncertainty perceived by the organization with regards to the complexity and stability of competition, consumer requirements, technological changes and regulatory constraints, the greater the need for more information processing and, thus, for cross-functional integration, according to Gupta et al.

5.2.2 Determinants of how much integration is achieved**Organizational factors**

Organizational factors, such as structure, management and operational design, are also claimed to influence the level of integration actually achieved between marketers and engineers.

Structural factors

Structural factors can be divided into degree of *complexity*, the degree of *formalization* and the degree of *centralization*. The more functions and types of specialists the company employs, the higher the degree of complexity, which, in turn, makes it more difficult to achieve integration between marketers and engineers. A higher degree of formalization and centralization also prohibits the integration between marketers and engineers. In this framework, formalization equals explicit rules and procedures, whereas centralization implicates that decision-making is done by few participants at a high level within the organization. On the contrary, *physical proximity* is assumed to increase the level of integration.

Management factors

Management related factors influencing the degree of integration actually achieved are determined by the level of *recognition of the value of integration*, *risk-encouragement*, *failure tolerance* and *joint reward systems* for marketers and engineers. In sum, the more the managers explicitly recognize the value of integration, encourage risk-taking and tolerate failure, the greater the level of integration achieved between marketers and engineers. What is more, integration is also supported by a joint reward system.

Operational character factors

Operational character factors are summarized as level of harmony prevailing among the marketers and the engineers, where a higher level of harmony equals greater degree of

integration. Engineering-marketing operating characteristics are considered to be more "harmonious" in cases where:

- Both types of professionals are involved early on in the product development process.
- The professionals attempt to understand each other's point of view.
- Potential conflicts between marketers and engineers are resolved at the lowest possible organizational level.
- Issues related to the integration are discussed rather than accepted.

Individual factors

When it comes to individual factors, Gupta et al. believe that similarity with regards to *professional orientation, tolerance to ambiguity, perspective on time and projects preferred* among engineers and marketers positively affect the level of integration achieved.

5.2.3 The integration gap and innovation success

Finally, the greater the gap between the degree of integration achieved and the level of integration required, the lower the probability of innovation success. Therefore, although a lot of research supports the assumption that well-established integration between marketers and engineers positively contributes to successful innovation, Gupta et al. propose that the level of integration needed should commensurate with firm strategy and perceived environmental uncertainty.

5.2.4 Why the framework was selected

The conceptual framework developed by Gupta et al. is presumably suitable in the context of our research due to its neutral focal point, where the authors refrain from assuming that cross-functional collaboration is inevitably problematic. Such problem angle is prevailing in similar frameworks, which, for instance, is the case in the framework developed by Keaveney introduced in the previous research section (Keaveney, 2010). Instead, the Gupta et al.'s framework is neutral in the sense that it simply presents factors that determine the degree of integration achieved. This approach corresponds well to the literature gap that we are attempting to bridge, as we aim to identify factors that influence the cross-functional integration achieved in a high-tech lean startups without presupposing conflicts or problems.

5.3 A practical framework for creating effective teams

Susan A. Wheelan has conducted research on how to turn a group into an effective team, under the assumption of two conditions (Wheelan, 2010):

- 1) A lot of the work carried out in contemporary organizations is too complex to be performed by a single specialized individual. Thus, many of the tasks require cross-functional team efforts.
- 2) There is a difference between a group and a team, where the former is composed of members, who are striving to develop shared goals and structures. Following this logic, a group becomes a team when shared goals and structures have been established.

5.3.1 The role of the organization in creating effective teams

In her book “Building Effective Teams” Susan A. Wheelan discusses many factors, referred to as productivity keys that she claims to facilitate the development of high-performing teams. A summary of these factors is presented in the table below.

Productivity key	Explanation
Clear goals	Goals should be discussed thoroughly to ensure that all team members have a shared understanding of their meaning. It is also important that the goals are meaningful to the team.
Clear roles	The team members must be aware of their role, have the ability and skills necessary to accomplish assigned tasks and must agree on and accept the assigned role.
Interdependence	Members of an effective team understand that effective cross-functional collaboration will beat an individual in accomplishing organizational goals at all times.
Leadership	In productive teams, the leadership style should be adapted, so that it meets the emerging needs of the team.
Communication and feedback	High-performing teams have an open communicational structure. They also receive and give regular feedback, as well as incorporate constructive feedback in their daily work processes in order to improve.
Decision-making and planning	Effective teams plan decision-making and problem-solving activities through discussions.
Implementation and Evaluation	Effective teams implement the solutions and decisions made by members.
Norms and individual differences	Successful teams establish norms that encourage high-performance, quality and success.
Structure	Effective teams are as small as possible, have enough time to accomplish what they need to accomplish and can work in productive sub-groups when necessary.

Productivity key	Explanation
Conflict management	High-performing teams are not free of task conflicts. However, they possess efficient conflict management strategies.

Table 3: Factors claimed to facilitate the development of high-performing teams as presented by Wheelan

5.3.2 Why the framework was selected

In the field of effective teamwork, there is an abundant body of existing literature, which focuses on how to transform a group into a team. What made us chose Wheelan's framework was that we find it less size dependent compared to many other frameworks that target large organizations with several hierarchical levels. Another reason for choosing Wheelan's framework was that it is, just like our research, not especially focusing on the leader in an effective team setting, which, for instance, is the case in a book written by George J. DeMetropolis on how a leader creates and handles effective teams (DeMetropolis, 2003). Finally, Susan A. Wheelan's research is not concerned with a specific industry and, thus, is more focused on generic organizational aspects. This is quite different from, for example, Pat Croskerry et al.'s book, where the setting is emergency care and hence not suitable for our study (Pat Croskerry et al., 2008).

5.4 A comprehensive framework for achieving successful engineering-marketing integration

Wheelwright and Clark have developed a framework for achieving successful engineering-marketing integration (Wheelwright and Clark, 1992). For the purpose of this thesis, we have organized their findings into productivity keys/factors in a pursuit of arriving at a similar table, as the one presented by Wheelan (see above).

An interesting assumption made by Wheelwright and Clark is that pursuing intensive cross-functional integration is especially crucial for companies facing rapidly changing technological and market conditions – notably, characteristics of our research companies.

Productivity key	Explanation
Shared understanding of customers	In order to achieve successful integration, the engineering department must be able to have full understanding and make use of the knowledge about customers and the way, in which they use the product.

Productivity key	Explanation
Sharing prototypes with the customers	Presenting prototypes of the product to the customer becomes of critical importance for understanding, what features customers want to see in the final product, both for the marketers and for the engineers. Such prototypes do not necessarily have to capture all the intended features; they could just present some of the functionality, the user interface, or the way, in which the product will be used.
Early involvement of both engineers and marketers	In order to avoid unnecessary expenditures on redesigning the product and wasted time, the whole customer interaction process should take place as early in the product development as possible.
Both marketers and engineers should meet with the customer	It is highly recommended for the engineers to meet the customers together with marketing in order to enhance the understanding of the customer preferences.
The importance of milestones	In order to strengthen the involvement of both functions in the product development process, there should be milestones set from the viewpoint of the progress of development of the whole firm, instead of success of separate functions.
The importance of contact and communication	In order to achieve cross-cultural integration, interlinking functional activities in time alone would not suffice. More contact and communication on an individual level between marketers and engineers is required problem-solving in the product development process. Thus, real cross-functional integration occurs on the working level, where individuals and teams solve problems together.
The importance of mutual trust and commitment	The importance of mutual trust and commitment between the departments is not to be underestimated. If the mutual trust and commitment are not present in the organization, the engineers will be reluctant to give marketing early prototypes, since by doing that they unveil weak spots and mistakes, and marketers might refuse to start working with such a prototype in the market.
Leadership	Senior management plays a key role in the integration process, since it sets the frame for functional activity and the specifics and timing of involvement of marketers and engineers in the product development process.
Overcoming negative attitudes towards integration	In some cases professionals might have to overcome some inherent attitudes for the company to achieve successful cross-functional integration.

Table 4: Factors claimed to influence the cross-functional integration as presented by Wheelwright and Clark

5.4.1 Why the framework was selected

Just like in the case of effective teams, the field of cross-functional teamwork is a very well researched area. Therefore, we had to choose between many different frameworks within this theoretical category. We found Wheelwright and Clark's framework suitable in the context of this thesis, as it, first of all, is focused on an innovation setting, which corresponds well to the situation faced by our research objects. For instance, we decided not to use a

framework presented by Glenn M. Parker, as Parker views cross-functional teams rather broadly with neither any particular emphasis on innovative product development nor on the specific marketing-engineering interaction (Parker, 2002). What is more, framework by Wheelwright and Clark was more suitable than many other frameworks, because it does not study the management of temporary cross-functional projects, where upon the completion the members return to their usual functional teams (Chin, 2004), but rather focuses on the ongoing NPD process.

5.5 Our theoretical framework

As explained in the introductory part of this section, the three frameworks presented above have – with some alterations – been synthesized into one theoretical framework. Since the purpose of this thesis is to identify factors that are influencing the collaboration achieved between marketers and engineers in a lean high-tech startup context, the alterations with regards to the frameworks have mainly been concerned with limiting them. We found the frameworks suitable for synthesis, since they cover different aspects of collaboration, yet they contain no contradicting assumptions. The synthesized framework is presented below.

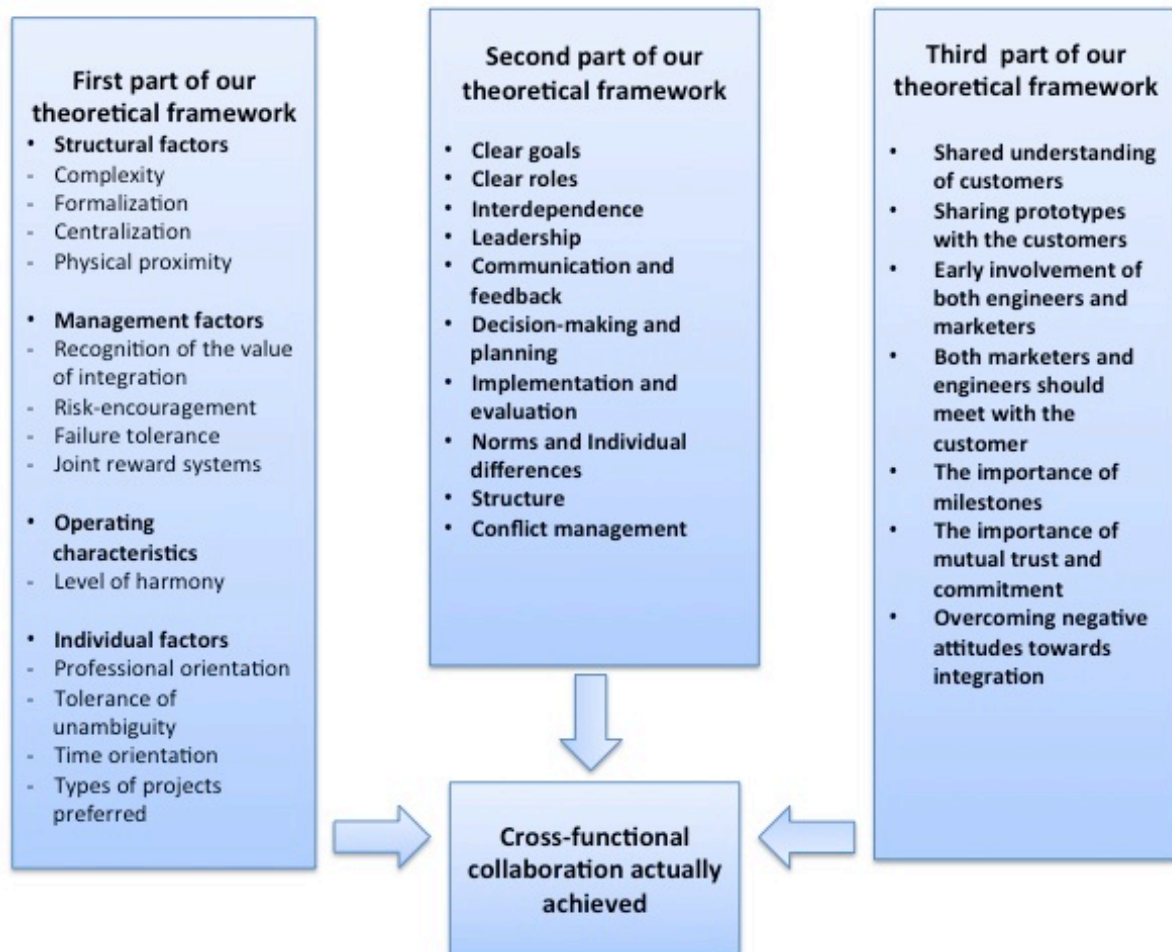


Figure 3: The theoretical framework of our thesis based on synthesis of Gupta et al., Wheelan and Wheelwright and Clark

5.5.1 The application of the theoretical framework

As stated, the purpose of this thesis is to identify factors that influence the cross-functional integration achieved in high-tech lean startups that are pursuing the lean startup concept. Some of these empirically identified factors will be classified according to the framework presented above. In the cases, where the framework fails to cover an identified factor, it will be extended through allowing for self-made categories.

6 Methodology

In this section we intend to explain how we proceeded in order to fulfill the purposes of this thesis and to answer our overarching research question. We will review our methodological approach and motivate our choice of method. We will also discuss potential limitations associated with the chosen methodology.

6.1 Case study approach

As has been mentioned previously, in our research we investigate the collaboration between marketing and engineering functions in a rather new setting of high-tech startups pursuing the lean strategy. We believe that the most suitable way to fulfill this purpose is to conduct our research using an exploratory qualitative case study approach. Such approach is claimed to be appropriate in cases, where the investigated phenomenon is contemporary and cannot be controlled by the researcher (Yin, 2003; Baxter and Jack, 2008). More specifically, the exploratory case study is considered especially useful when the researcher does not have the ability to regulate and control all the variables that are relevant for the research (Sjöstrand, 2004).

Furthermore, data on lean high-tech startups is not readily available, which is one of the reasons why we chose to focus on the qualitative method of data collection, completely leaving out the quantitative approaches. Moreover, the collaboration between marketing and engineering functions is difficult to quantify, meaning that a qualitative approach to research would still be preferable, even if the data on high-tech lean startups was abundant and readily available.

Thus, due to the nature of our research, we have chosen to conduct an exploratory qualitative case study.

6.1.1 Selection of case study companies

Our research is based on case studies of two high-tech startups, Saltonsoft¹ and Truecaller (both will be presented in more detail in the “Results” section), whereby Saltonsoft is our primary case study company and Truecaller our secondary case study company. We decided to make a distinction into primary and secondary case companies in order to limit the scope

¹ Saltonsoft is a fictional name created out of anonymity reasons.

to what is possible to cover within a master thesis due to the limitations imposed on the length of the thesis.

Thus, the data will be mainly gathered at Saltonsoft, which, in turn, implies that the analysis will be mainly based on Saltonsoft. The data from Truecaller is used to increase the population sample of the high-tech startups that participated in this study and to see, whether the findings based on the data from Saltonsoft are also true for other startups.

To begin with, we found Saltonsoft to be a suitable primary case company, as it presumably is comprised only of marketers and engineers, therefore, there definitely exists very close cooperation between the two employee groups.

Moreover, Saltonsoft also categorizes itself as lean in accordance with Eric Ries' definition of the concept. Furthermore, Saltonsoft's founders are organizers of the Lean Startup Circle meetup group in Stockholm, and are regularly invited to attend the Lean Startup Conference. The company is, therefore, very involved in the "lean community" and is one of the trendsetters in the lean startup area worldwide (the lean processes applied at Saltonsoft will be presented in the "Results" section).

Therefore, we believe that Saltonsoft represents an appropriate main case for investigating the collaboration between engineers and marketers in the context of lean high-tech startups.

We received the contact details of Truecaller's CEO from Saltonsoft, who recommended the company as one of the most interesting startups in Sweden at the moment in terms of the product offering and the high pace of development. Truecaller is also a highly technological startup, where the main functional division is between marketers and engineers. The company has been following the lean principles from the start in order to be most efficient in its processes. Therefore, we believe that Truecaller represents an appropriate secondary case study company.

Since our research does not focus on establishing, whether our case companies can indeed be viewed as lean in accordance with its theoretical definition, we saw the companies' effort to conduct business and product development according to the lean principles and main functional division into marketers and engineers as sufficient selection factors.

In the beginning of our research we have also considered studying other high-tech startups to make our findings even more reliable, however, it turned out to be quite problematic to find startups that could match Saltonsoft and Truecaller from the lean orientation

perspective. For instance, we have contacted Virtusize, who were open to participating in our research, but the company has not started implementing lean or integrating customer feedback yet, therefore, we had to omit this case in this thesis.

6.1.2 Interaction with case study companies

As mentioned in the section above, we interviewed two case companies. Both of the companies in question are mainly comprised of marketers and engineers, and, since the purpose of the interviews was to get the most complete understanding of the collaboration between engineering and marketing in the context of implementing lean, inputs from both employee groups were extremely valuable.

The interview design remained the same for both interviewee groups in the critical incident technique part (see section "CIT interview procedure"). However, additional interviews were conducted with the marketers and engineers in managerial positions to get the general information about company strategy and lean orientation.

At Saltonsoft we interviewed all the employees, more precisely two marketers represented by CEO and CPO (both founders) and four engineers represented by CTO (founder) and three software developers.

In the case of Truecaller we interviewed three employees, the Marketing Manager and a software developer, representing the functional groups that are in the focus of our research, as well as the Release Manager, who bridges the gap between the two functions.

6.2 Data gathering

In order to collect the data for our research, we have first studied the underlying theoretical basis and previous research on the subject, described in the sections "Previous research" and "Theoretical framework", and further proceeded to qualitative data gathering with the help of interviews, which will be elaborated further on in the following sections.

6.2.1 Process of data gathering

All the interviews were conducted by us individually and face-to-face. We interviewed the participants in English, since all the interviewees were comfortable with it and could express themselves clearly. We asked for their permission to record the interviews and assured them that their answers would be presented anonymously in order to encourage more open and honest replies.

We have pursued the strategy of constant iterations: after each interview we fine-tuned the questions in order to optimize the interview results, whereby questions, which the interviewees had troubles understanding, were rephrased. Yet we focused on maintaining sufficient standardization to secure the validity and reliability of the data (Barriball and While, 1994).

6.2.2 Critical incident technique

We chose the critical incident technique (CIT) suggested by Flanagan as our main method of data collection (Flanagan, 1954). CIT is an interview method that is targeted at understanding how individuals approach critical situations in terms of actions, tactics, and behaviors. Moreover, this technique is especially useful in interviewing several respondents, since it allows for better generalizability of results, which has traditionally been a weakness in case study researches (Cassel and Symon, 2004).

The aim of this technique is to disclose critical incidents or situations that are memorable to the interviewee in some way relevant to the research subject. The factors that influenced the situation that the interviewee decides to describe determine the perception of the research subject, according to the technique. Moreover, in case of the majority of interviewees disclosing the same influence factors, it can to a high degree of certainty be presumed that these factors shaped the perception of the research subject in the organization (Flanagan, 1954). Thus, the CIT enables us to find out, whether the perception of the research subject is homogeneous or heterogeneous within the organization as a whole.

1.1.1.1 Applicability of the CIT in collaboration context

Historically CIT gained popularity in the field of health care research (FitzGerald et al., 2008), where it became known as a method that encourages the natural tendency of people to tell anecdotes, while increasing their value as data (Bradley, 1992). However, nowadays the CIT is becoming increasingly popular in research within other industries as well. For instance, the CIT has been considered helpful in different service-related contexts, where it is viewed to have been beneficial for deepening the understanding of a variety of issues (Gremier, 2004).

Although we have not found the evidence of the CIT being used in the research on marketing-engineering collaboration, it, for instance, has been used to analyze the behavioral factors that influence the collaborative interaction between marketers and

logisticians (Ellinger, 2000) or between departments in consulting and utility companies (Tjosvold, 1988).

Thus, we believe the CIT to be an appropriate technique to enhance the understanding of what factors influence cross-functional collaboration between marketers and engineers in the context of our research.

1.1.1.2 The advantages of the CIT

Since the CIT does not give any indication of what is the “right” or “wrong” answer, it can be expected that the interviewees express themselves freely without integrating any bias stemming from the formulation of the question. Moreover, the CIT presumes questions that are quite explicit and easy to answer, since the interviewee is being asked to pick a memorable incident that is suitable according to his judgment instead of to perform an objective analysis of what the situation looks like in his company. Moreover, the fact that employees identify the critical incidents themselves means that unexpected issues related to studied phenomenon might be unveiled, which may not be the case in pre-structured interviews (Chell, 1998).

Moreover, an advantage of CIT is that it is retrospective and, thus, recreates the direct causal relationship between the incident and the outcome. The focus on the critical events creates a structure, where the cause, the course, and the result of each event is outlined, allowing for detailed causative analysis (Chell, 1998).

1.1.1.3 The disadvantages of the CIT

According to Fisher, the main difficulty with the CIT is the allocation of incidents to categories, which is done according to researcher’s judgment and, thus, can be subjective (Fisher, 2010). Fisher refers to it as problem of inter-rater reliability and suggests that it can be diminished by several people allocating the incidents to categories independently and then achieving agreement, on which factors should be included and excluded.

We pursued the approach suggested by Fisher when analyzing the data by independently categorizing the factors first and then achieving agreement on which factors are the most prominent and should be included in the analysis. We also mitigated this issue by introducing the threshold of being mentioned in at least three interviews in a case company for a factor to be considered prominent.

1.1.1.4 The process of arriving at the CIT questions

In order to form the CIT questions in the most relevant way for our research, we first began with collecting preliminary data, both in theoretical and in practical context.

First of all, even before outlining our research question, we met with one of the founders of Saltonsoft, our primary case company, in order to discuss the firm's official strategy and perception of lean as well as its business model. This meeting gave us a good understanding of the background of the company and the way its business is structured. It also revealed that there had been difficulties in lean implementation with regards to cross-functional collaboration that the company managed to overcome, which helped to determine the focus of our research.

After that we skimmed through the literature that has been published in the areas of cross-functional, specifically marketing-engineering, collaboration and lean implementation. Having collected the information enabled us to define, what aspects of the company seemed most interesting to us in the context of scientific research and to form the preliminary research question.

In order to test the perceived relevance of our research question, we scheduled another meeting with the founders of Saltonsoft. The CEO, CPO, and CTO were asked to describe the product development and lean implementation processes in more detail. They also confirmed the importance of marketing-engineering collaboration in the lean startup setting and, hence, the relevance of our research question.

Following the second meeting, we conducted a deeper analysis of the literature areas mentioned above and selected the most relevant theories, which are highlighted in the "Theoretical framework" section. Upon studying the theories, we were then able to get an overview of the aspects we wanted the interviews to cover.

Thus, our CIT questions were the following:

- *Please tell us about a situation when you worked together (marketing and product development teams) and achieved success in product development.*
- *Please tell us about a situation when you all worked together, but were not very successful in product development.*

1.1.1.5 CIT interview design

CIT can be designed in several ways, ranging from strictly pre-structured, where the interviewee is asked to answer only the questions prepared in advance, to very flexible, where the interviewee describes as many incidents as he wishes. We chose to have a predefined number of incidents (two) from each respondent with the possibility to ask additional questions, which in the context of CIT corresponds to a semi-structured interview structure (Chell, 1998). We deliberately made this choice, since, in order to explore the inter-functional collaboration in a lean startup setting, both a clear interview structure and the possibility to proactively ask more specific additional questions are necessary. According to Fischer, in semi-structured interviews the respondents have much latitude to respond to the questions in a way that seems most sensible to them, whereas the topics that need to be covered are controlled by the interviewer (Fisher, 2010). We believe that this latitude in answering allows for more disclosure of opinions and, therefore, is very beneficial in establishing, what exactly every interviewee thinks of cross-functional collaboration in his company. Moreover, semi-structured interview approach allows for unexpected findings to emerge from slightly different angles (Wallén, 1996).

1.1.1.6 CIT interview procedure

We have approached the CIT in the following steps.

During the interview we first presented ourselves, clarified the purpose and scope of our research, and explained the CIT. Then we ask the interviewee to shortly outline his position and responsibilities, with the purpose of receiving the background information as well as “warming” the interviewee up for the CIT questions.

Further, we went on to the questions around the critical incidents. Each of the interviewees was first asked to tell us about a situation, where the marketing and product development specialists worked together and achieved success in the product development process. After the interviewees described the situation, we asked them three questions that were identical in each interview about the factors that caused this incident to happen, the role that the cross-functional team effort played in it and the results of the incident. Depending on the depth and clarity of the received answers, we also asked follow-up questions, mainly related to the processes and routines with regards to cross-functional communication and collaboration in the product development process.

After that the interviewees were asked to describe a situation, where marketing and product development specialists worked together, but were not very successful in the product development process. The situation description was, once again, followed by the same three questions in order to get a deeper understanding of its underlying causes and effects. In case the answers lacked the depth necessary for our research, we asked additional follow-up questions.

We deliberately left out “lean” in questions about critical incidents, since different employee groups might have different depth of knowledge about the concept, and we did not want these questions to be in any way misleading. Moreover, by asking about successful or unsuccessful cases of collaboration, we implicitly got the information about whether lean implementation was functioning well or had some difficulties because of lack of marketing-engineering collaboration.

6.3 The overview of the interviews

In total, we conducted 16 interviews with 9 interviewees, out of which 11 interviews were conducted at Saltonsoft and 5 at Truecaller.

Apart from the initial two interviews with Saltonsoft’s founders that were targeted at getting an understanding of the company’s strategy and internal processes, as outlined in the subsection “The process of arriving at the CIT questions”, we conducted three further interviews with each of the three founders in order to get the data about the lean processes in the company. Such background information was necessary in order for us to grasp the firm-specific context and to understand the implicit perceived need for cross-functional collaboration. After that we conducted six interviews in accordance with the CIT with each member of Saltonsoft’s team individually.

Similarly to the process of collecting the data at Saltonsoft, at Truecaller we first met two managers individually to discuss Truecaller’s strategy, its perspective on lean and its implementation processes. After that we interviewed the two managers and one software developer in order to gather the data for the CIT.

In the table below the overview of the conducted interviews is presented. Each interview, except for the second one that involved the founders of Saltonsoft in the discussion about the processes in the company, was conducted with every interviewee individually. The focus of the table is on the interview subject to make it easier for the reader to follow our interview

process, which is why the interviewees are grouped together. The table listing all the interviews is provided in the Appendix.

Interviewees	# of interviews	Interview subject
Saltonsoft: CEO, CPO, CTO	2	Firm's strategy and processes
Saltonsoft: CEO, CPO, CTO	3	Lean processes and orientation in the company
Saltonsoft: CEO, CPO, CTO, and 3 Software developers	6	CIT
Truecaller: Marketing manager and Release manager	2	Firm's strategy and lean processes
Truecaller: Marketing manager, Release manager, and a Software developer	3	CIT
Total	16	

Table 5: Interviews overview by subject.

In order to portray the data anonymously, we will replace the interviewees' names with pseudonyms as suggested by Thomson (Thomson, 2005) so that the data "tells a story without telling, whose story it is" (Corti, 2000). To make it easier for the reader to grasp our analysis, we will divide the interviewees into the two distinctive functional groups - Marketing and Engineering, which will be added to the fictional names when referring to the interviewees.

	Position of the interviewee	Functional classification	Company	Designation
1.	CEO	Marketing	Saltonsoft	Axel
2.	CPO	Marketing	Saltonsoft	Oscar
3.	CTO	Engineering	Saltonsoft	Arvid
4.	Software developer	Engineering	Saltonsoft	Felix
5.	Software developer	Engineering	Saltonsoft	Joel
6.	Software developer	Engineering	Saltonsoft	Emil
7.	Marketing manager	Marketing	Truecaller	Jesper
8.	Release manager	Engineering	Truecaller	Marcus
9.	Software developer	Engineering	Truecaller	Mats

Table 6: Overview of the interviewees.

In the "Results" section the interviews from Saltonsoft and Truecaller are going to be depicted separately, starting with the information about companies' operational environment, processes and lean way of working received and moving on to the critical incidents that were exposed in each individual interview.

6.4 Data processing

6.4.1 Structuring the data according to the theoretical frameworks

As mentioned in the “Theoretical framework” section, we used the frameworks suggested by Gupta et al., Wheelan and Wheelwright and Clark to form our framework to classify the factors that we identified in our interviews. However, because the purpose of our research is to identify the factors that influence the collaboration achieved between marketers and engineers in a lean high-tech startup context, we have omitted the first part of Gupta et al.’s framework that focuses on determining the nature of perceived integration and focused on its second part instead.

More specifically, when analyzing the CIT data from interviews, we structured the factors according to our framework presented in the end of the “Theoretical framework” section, as demonstrated in the graphic below.

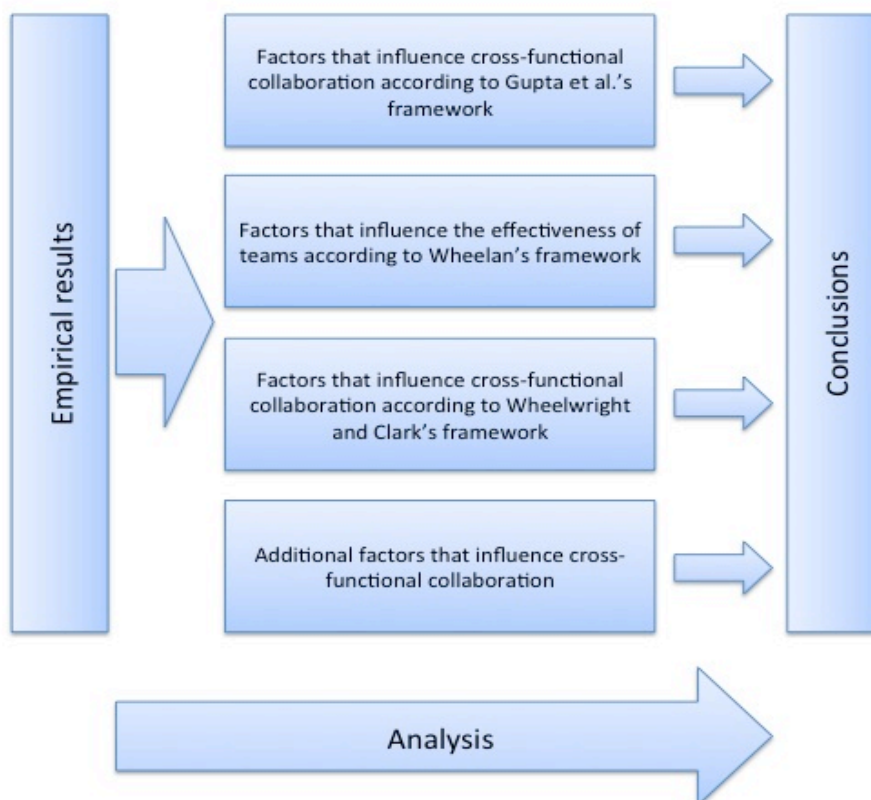


Figure 4: The process of analysis.

6.4.2 CIT interview analysis

After each interview, we transcribed it and identified factors that the interviewee had talked about explicitly or had pointed to implicitly. These factors were then treated as specific for the particular employee in relation to the critical incident described and, in order to keep an overview, were put into a table. As soon as we had identified a factor, we tried to group it in accordance with the factors in our framework. If we did not find a suitable group, we simply allowed for adding other factor groups.

After each interview, factors were grouped in accordance with the process outlined above, and upon completion of such grouping, we excluded groups containing factors that were mentioned by less than three interviewees in either company.

We decided that being mentioned by three interviewees would be a suitable elimination criteria in our case, since (1) at Saltonsoft three interviewees represent 50% of company's population, and (2) at Truecaller we have only had three interviewees, therefore, eliminating factors that have not been mentioned by every interviewee would add rigorousness and compensate for the low interviewee number.

6.5 Other potentially applicable data gathering techniques

Naturally, there is a wide range of methods that could have been used for data collection, even though we consider the CIT to be the most suitable method, as discussed in the previous sections.

For instance, observation could have been a technique to observe the collaboration. It could be used both as preliminary work in a more positivist approach, or as a major component of the research in a more interpretivist approach (Fisher, 2010). We decided to not use this technique, first of all, since it would take our case study companies some time to get used to our presence and to act "naturally". Secondly, we believe that in such a technologically intense setting, in which our case companies are operating, it would be very hard, if not impossible, for an outsider to make sense of the events he observes.

Furthermore, another method, which could have been at least partly used, is panels, and focus groups in particular. For instance, we could have asked the marketers and engineers in each of the case companies to get together and to discuss the subject of cross-functional collaboration in product development in their company. However, we find that in such method it would be easy for some people to dominate the others in the discussion, resulting

in many views on the subject never coming to light (Fisher, 2010). Moreover, as mentioned before, the subject of collaboration could be quite sensitive, so that people could be reluctant to share their views in the presence of their coworkers.

6.6 Limitations

In order to achieve reliable qualitative results from our interviews, we chose to rather focus on few companies, but to perform a deep analysis, than to interview a larger number of companies at the cost of the quality of our research. Although we believe that such rigorous analysis more than compensates for the scope limitation, it has to be pointed out that our findings based on information from two companies cannot be generalized to the whole population of high-tech startups pursuing the lean strategy.

Moreover, due to geographical accessibility, both interviewed companies are based in Stockholm, Sweden, which could also have a certain impact both on the local specifics of firm organization, internal communication, and routines, as well as on behavior during interviews.

Naturally, another limitation of our research lies in having to rely on the answers of interviewees. Although we tried to mitigate the risk of “adapted” answers by beginning with the general questions targeted at making the interviewee feel comfortable and creating a trusting and easy-going atmosphere, we might not be aware of some political agendas in the interviewed companies that might somewhat affect the sincerity of the answers.

Finally, due to the scope of our thesis, we were limited in the amount of the CIT data we could process and interpret. Thus, in Saltonsoft we interviewed the whole company population, but in Truecaller only three employees. Although the interviews still covered the functions significant for this research – marketing and engineering - it could have been beneficial to interview more employees at Truecaller.

6.7 Methodological issues

First of all, throughout our thesis we have categorized the employees in the startups in two distinct groups: marketers and engineers. The previous research that has been done on this topic took place in large well-established corporations with separate Marketing and Engineering (R&D or Product Development) departments, which also have very hierarchical structures. However, in case of high-tech startups, where the employees are few and hierarchy is very flat, it might be the case that the borders between the two groups –

marketers and engineers – are very thinned out or even inexistent. Then the potential conflict comes down to interpersonal conflict between different employees. We tried to mitigate this problem by choosing very technology oriented startups as our case companies, so that, even in the absence of distinct marketing and engineering units, we could still assign the employees to these two groups.

When it comes to data gathering and analysis, it has to be noted that the results of the CIT interview questions have to be interpreted in such a way that important influence factors can be singled out. For instance, we used the criterion of 3 out of 6 interviewees at Saltonsoft and 3 out of 3 interviewees at Truecaller mentioning the same factor to single out prominent factors. This process leaves a lot of room for analysis and interpretation, which, of course, also means that the results are going to be influenced by the researchers' bias.

Although our research is based on primary data, the answers of the interviewees might be affected by several factors. First of all, our CIT questions contained such terms, as team effort and success, understanding of which is not identical for any two persons. Thus, it is to be expected that the interviewees answer our questions according to their previous experiences, personal thoughts and beliefs, which might not only differ for every interviewee. Therefore, it would be quite challenging, if not impossible, to "quantify" the answers according to some scale in order to draw conclusions about the intensity of influence of single factors, which were identified in multiple interviews, on cross-functional collaboration. However, we are rather aiming at identifying, which factors influence the cross-functional collaboration achieved in high-tech startups pursuing the lean startup strategy.

Another issue with data collection could be that investigating the effectiveness of internal collaboration or potential issues connected with it could be a difficult task in itself, since it might be a sensitive topic. Thus, extra attention had to be paid to phrasing the questions correctly and leaving room for the interviewee to express himself, which is why CIT seemed to be a proper choice of method in our case.

However, the choice of CIT as our main interview approach with the focus on critical events can also be viewed as a methodological limitation, since non-critical issues also relevant for our research might not be uncovered, as might be the case in, for example, unstructured interviews.

6.8 Reliability and validity

Reliability implies the possibility of achieving the same result when repeating the research, given that the research object and underlying conditions remain the same (Wallén, 1996). The primary data that our research was based on was collected via interviews, which carries certain risk for the reliability of the research, since the interviewees might give different answers when asked the same question multiple times. However, it is hard to mitigate this risk, because if the interviewees were subjected to the same interview several times, they would have time to reflect upon the situation described in CIT and their answers in the first interview session and revise their answers for the next sessions.

On top of the interview design, interview procedure in itself could also affect the interview outcomes. For instance, there is a risk of deviations between interviews in how the interviewer clarifies the exact meaning of questions and what follow-up questions he/she asks. We tried to avoid much deviation by sticking to the same questions in all the interviews.

Moreover, in order to ensure high validity, or in other words, to measure what we are aiming to measure (Wallén, 1996), we have carefully thought through the design of the interviews in relation to our research question and made sure that every question we ask contributes to our research.

There is a risk that both reliability and validity of our research might be impacted by the choice of data collection and analysis method. CIT, however suitable for our research, leaves a lot of room for researcher's own judgment when analyzing the interview data, segmenting separate factors that contributed to the critical incident, and then grouping them. We aimed to remain as objective as possible when analyzing all interviews by anchoring them to our theoretical framework and by first arriving at individual conclusions about the factor groups and then discussing them together.

6.9 Deviations

In our research there were no significant deviations in relation to what persons we were aiming to interview from the persons we actually managed to interview. Saltonsoft was our initial choice for the primary case company because of the reasons outlined in the "Selection of case companies" section, and as for the secondary case company, we were quite flexible in our choice, as long as it was comparable to Saltonsoft and fulfilled certain requirements

outlined in the respective section. Therefore, we did not have to deal with a situation when companies of our primary choice for interviewing did not want to cooperate.

6.10 Generalizability

Since we chose quite a narrow scope for our research, the findings of our research are naturally limited to high-tech startups that define themselves as lean.

Moreover, the choice of case study approach in conducting our research implies that the results of the research are going to be highly influenced by the unique situations of the case study companies. Therefore, there might even be limitations to generalizing the results of our research to other high-tech startups pursuing lean strategy.

6.11 Ethical considerations

We conducted our research in such a way that it could not harm or affect anyone negatively. We have always proactively clarified the aim of our research to all interviewees as well as asked them for permission to record their answers. We also found it important to give our interviewees the possibility to remain anonymous, since it allowed them to speak more freely than they might have done otherwise.

We also aimed to be extremely aware of the question formulation regarding the existence of potential collaboration issues within cross-functional teams, since it might be a sensitive topic.

7 Results

In this section, we will present the interview results.

We will start off with presenting the case companies, whereby the general information in the section stems from such sources as companies' internal material and the more specific information about their operational environment and development processes has been acquired during the interviews on the 20th of December 2012 and on the 15th of January 2013 at Saltonsoft and on the 24th of April 2013 at Truecaller. As for interviews about lean processes, they were conducted on the 5th and 24th of April 2013 at Saltonsoft and Truecaller respectively.

The data presented in the sections depicting the critical incidents is very close to interview protocols and will be outlined in accordance with the structure used during the CIT interviews conducted on the 5th and 24th of April 2013 at Saltonsoft and Truecaller respectively.

In the end of the CIT section for each case company, a table with an overview of identified factors is presented to enable an easier transition to the analysis part. In the appendix a table depicting factor classification with more detailed references is presented.

7.1 Interviews at Saltonsoft

7.1.1 Presentation of Saltonsoft

Saltonsoft is a Swedish software startup founded in 2010. Today the company employs a team of four engineers and two marketers, who work on simplifying web development through eliminating wasteful activities that prevent developers from focusing 100% on their codes.

1.1.1.7 General information about Saltonsoft

Value proposition

Saltonsoft summarizes its value proposition as follows:

"Saltonsoft makes it super-simple to create and discover code, build web apps and publish them to the web".

This means that the company makes hosting more convenient through solving the problems associated with deployment and scaling. However, what differentiates Saltonsoft from its

competitors the most is the user-friendly desktop interface with a drag-and-drop function. The product is claimed to reinvent hosting as it enables the user to host web applications, blogs and websites and to collaborate on the source code in a much more convenient way than comparable services.

Development stage

Saltonsoft is now at the startup stage and is working on releasing the final version of the product. The founders are also engaged in attracting further sources of financing, such as venture capital or business angels. The meaning of this level of development in relation to our research question is that Saltonsoft is at a stage, where reaching successful collaboration between marketing and engineering can be claimed to be especially crucial. Both attracting good investors and developing the final product are highly dependent on the intense internal collaboration between the two functions.

Customer segments

Saltonsoft has chosen to differentiate its product from other products on the market through targeting a customer group that is a slightly different from the conventional one within the industry. In sum, the typical customer of Saltonsoft is a “mainstream developer”, who is relatively inexperienced in the field and not interested in creating the infrastructure necessary for writing code. The application of the lean startup concept with regards to the target customer implies that the marketers at Saltonsoft are constantly delivering customer feedback to the engineers that, in turn, regularly provide the marketers with prototypes updated on basis of this feedback.

Lean orientation

From the very beginning Saltonsoft has been implementing lean processes, where different hypotheses have been constantly tested on prospective customers, and further development has been adjusted accordingly. One of the founders even wrote his master thesis about lean and tested the concept on his own startup, Saltonsoft, which resulted in the creation of the lean startup canvas, a practical guide to lean followed by the company to this day.

Saltonsoft's founders are active followers of lean: they have created the Lean Startup Circle meetup group in Stockholm to be able to meet like-minded entrepreneurs and exchange ideas. They have also been invited to participate in the Lean Startup Conference in the US several times.

1.1.1.8 Operational environment and development processes at Saltonsoft

As highlighted by all interviewees, Saltonsoft operates in an extremely fast evolving industry making it difficult to make plans for the future, as well as to conduct proper time estimates. Saltonsoft is trying to mitigate this problem through weekly iteration planning aimed at distributing resources and at ensuring that cross-functional efforts holistically contribute to the product development process.

Marketing Axel and Marketing Oscar constantly interact with customers and collect customer feedback, which is discussed on a weekly product meeting attended by the three founders. During this meeting the founders look at the product roadmap and make changes to it on basis of the customer feedback received. Thereafter, Marketing Oscar meets with the developers (who develop the code that constitutes the product offered by Saltonsoft) for iteration planning and for breaking down the priorities, dictated by the customer feedback, to a weekly level. This way, everyone gets aware of what the customer thinks of the product more or less as soon as the feedback reaches the marketers and they also become aware of what needs to be done during the coming week.

The iteration planning is in turn part of an “episode”, consistent of several iterations, which collectively concentrate on the features that need to be released at the end of the episode. Essentially the last iteration in the episode entails the “code-freeze”, where nothing is added to the code. The purpose of the code freeze is to make sure that its current features are completed and properly working, otherwise they will be excluded from the release and pushed on to the next one.

Additionally, so-called “scrum-meetings” are being held on a daily basis, which stem from the agile “scrum system” and imply a meeting that is as short as possible. The purpose of such meeting is for everyone to tell each other what they have done during the day, what they are going to do tomorrow and what potentially could hinder them from accomplishing their plans.

In the context of planning, all three founders explain that from the very beginning Saltonsoft did not formally employ planning routines such as iteration planning and scrum meetings. However, as the company developed and they hired more engineers they simply realized that they had to become more structured. This formalization, in terms of going from no formalization to some formalization, has been very advantageous for the company, especially with regards to the cross-functional collaboration.

1.1.1.9 *Lean processes at Saltonsoft*

Marketing Axel claims that what makes Saltonsoft lean is the absence of a “yes-culture”, implicating that the culture at Saltonsoft is more of the reflective kind, where everybody can question any action. What is more, he also states that through reflection the company enforces solid bases for its hypotheses. Marketing Oscar adds to this argument through stating that Saltonsoft follows the lean startup approach closely, which contributes to a great awareness of its actions. Engineering Arvid exemplifies lean practices at Saltonsoft through claiming that a multifaceted product, such as the one offered by the company, becomes increasingly hard to overview and unfortunately, as a result people tend to “wall themselves in” with their certain tasks. To mitigate this problem, Arvid introduced the practice of “team programming”, which presumably has “lean roots”. The purpose of this type of programming is that the team gets together and works on the same code collectively in a pursuit of getting everyone on the same page.

Both Marketing Axel and Marketing Oscar outline the lean startup approach with regards to collecting customer feedback in the following way: Marketing Axel and Marketing Oscar constantly interact with the customers, although they are concentrating on slightly different segments. Marketing Axel focuses on the customers who are interested in trying the product, but who have not yet done so due to, for instance, a missing product feature. Marketing Oscar, on the contrary, communicates with active customers, that is, the ones who are already users of the product and who have more hands on feedback to share, which Marketing Oscar seeks to collect during his visits. This process referred to as “user testing” in brief entails letting the customer try out product prototypes, also known as MVPs. Such testing is an essential part of Saltonsoft’s application of the lean startup concept, since the “real” users can test the product to a greater extent compared to the testing conducted by the team members. As for now, it is mainly the marketers that meet with the customers and receive their feedback. However, Marketing Axel explains that the company is considering to allow the developers to attend the feedback sessions, a routine that he believes can be fruitful from the perspective of the developers. His reasoning goes as follows, that it is essential for the developers to see the customer “pain” with their own eyes and thereby become more “emotionally” involved in lean way of working. At the same time, Marketing Oscar believes that it is quite easy for the developer to grasp the essence of the lean

approach anyway, since a similar concept called “agile development” is a central part of their engineering education.

As mentioned earlier in relation to the iteration planning, the customer feedback collected through the processes outlined above is then forwarded into the product development process through the weekly iteration planning meetings, preceded by the meetings attended by the three founders.

To sum up, the lean feedback process employed at Saltonsoft is displayed graphically in the figure below.



Figure 5: The primary lean process applied at Saltonsoft.

7.1.2 The critical incidents at Saltonsoft

1.1.1.10 Positive incidents at Saltonsoft, where engineers and marketers worked together and achieved success in product development

Marketing Axel: to small victories through routines and communication

Axel believes that a startup should never consider itself successful, but rather strive further. However, he does believe that small victories along the way must be celebrated within the team in order for its members to stay motivated. For instance, one such small victory was scored when Saltonsoft managed to put together a very early MVP that could be presented to stakeholders. According to Axel, the success was due to the fact that the prototype was

beyond expectations, which, in turn, was the result of the product developers' ability to take initiatives and to think outside the box. The outcome of this positive incident with regards to cross-functional collaboration was an improved product as well as good atmosphere within the team.

Axel says that one of the keys to this success was the fact that the company had managed to get "right" behaviours and routines in place (for example, the daily scrum meetings and the weekly iterations). Axel notes that these "right" behaviours and routines do not just happen by themselves, but have to be planned for, and the best way to do that is through focusing on aspects that already feel natural to the members of the team.

Axel also explicitly mentions good communication, both among the developers and between the developers and marketers, as one of the main success factors that caused this incident to happen. The role of communication in this case was especially crucial in prioritization of work tasks on part of the developers, according to Axel.

Marketing Oscar: impressing investors and customers with a MVP

The positive incident occurred shortly after Saltonsoft hired three additional software engineers in pursuit of taking the prototype to the stage of the final product. The situation was such that Oscar and Marketing Axel had publically announced the launch of the product, which created external pressure, meanwhile the product development process turned out to be much more time consuming than expected. In order to be able to present the product concept to the investors and customers, Saltonsoft decided to build a preliminary product version, more focused on the user experience side than on the technical aspects. Therefore, the founders told their newly hired engineers to build a simulation of the product Saltonsoft was going to offer, which turned out to be a success due to the cross-functional efforts.

The outcome of the incident was that Saltonsoft had a product that could be demonstrated to stakeholders and used in the discussion with potential investors. Oscar concludes that this was a truly lean project, as it was decided to not build a full product version, but rather a MVP that served as a feedback collector. Moreover, the project resulted in validated learning, which led to improvements of the processes of the company.

Oscar finalizes by stating that without the team the building of the MVP would not have been feasible and that the MVP is the reason the company has survived.

Engineering Arvid: taking a shortcut to success

Arvid told us about an incident that happened at the product release stage, where there was a lot of pressure coming from investors and customers, who wanted to see, what Saltonsoft had to offer. This, in turn, encouraged Saltonsoft to establish clear and meaningful goals in order to make everyone aware of the objectives with regards the outside pressure.

The key to the successful product launch was realizing that the company could take a shortcut through building a MVP. According to Arvid, the MVP reduces the scope of the work, so that what is delivered is not perfect, but good enough.

Arvid also outlines other more general factors that he finds essential for startup firms with regards to the cross-functional collaboration: team communication, planning ahead, flat hierarchy, and a shared vision/focus within the team. More specifically, Arvid elaborates on the importance of establishing a joint product vision, which, from time to time, is difficult due to the complexity of Saltonsoft's product.

Finally, Arvid states that the developers need to synchronize their work at all times. Therefore, it becomes critical for Marketing Oscar and Marketing Axel to adapt to the process, as, unless the synchronization is achieved across functions, the full efficiency will not be realized.

Engineering Felix: the agile handling of customer feedback

Felix begins the story of his positive incident by updating us on the fact that Saltonsoft has created a closed product beta version, which is currently subject to limited user testing, but will be officially released within short. He notes that it has been an important milestone for the success achieved by the team.

Felix claims that the recent progress comes from the company's agile way of working, which enables quite "frictionless" work in the sense that no one is wasting time waiting for another person to finish his task. That is, agile processes help the company to synchronize work, which, according to Felix, is one of the biggest challenges within software development and can be costly if not properly achieved.

Felix also mentions that Saltonsoft has learned to avoid having “go-to-guys”², in the sense that the developers are trying to enable everyone to do, more or less, everything related to product development. Therefore, Felix believes that his role entails that he should be able to work on any part of the system and, at the same time, make sure that everyone else can do the same. Felix claims that such distribution of responsibilities has contributed to successful development in the company.

He summarizes his answer through stating that scrum and iteration planning has proven to be very important for the cross-functional collaboration, as it keeps everyone updated on the customer feedback and involved in the process. Moreover, it also helps to establish a shared view on product development in the team.

Engineering Joel: the importance of being on the same page

Joel has difficulties choosing one particular incident, since he believes that the team makes progress with regards to product development on a continuous basis. Most of the positive events start off with Marketing Oscar visiting the customers in order to create a list of things that the customers want to improve. This information is passed on to the developing team through meetings and workshops, and it is up to Joel and the rest of the developers to fix the issues in the product associated with the negative feedback. However, since Joel is not the typical user of Saltonsoft’s product, he believes that observing users directly by attending customer meetings could be a good compliment to the feedback forwarded by Marketing Oscar.

Joel points out that one success factor with regards to cross-functional product development is that the whole team is on the same page and does things in the right order. This implies that the frontend developer, the backend developers and the marketers need to be synchronized. According to Joel, unless everyone is on the same page, engineers and marketers have to guess what their colleagues are doing and then hope for a fit with regards to what they have been working on themselves.

Engineering Emil: “nicely” distributed tasks

Emil thinks that the biggest achievement with regards to cross-functional efforts so far happened last fall when the team was under a lot of pressure to produce a version close to

² The term “go-to-guy” is used at Saltonsoft simultaneously with a developer that has a very distinctive specialization and always needs to be present in the product development process, which otherwise cannot be completed.

the final product in the pursuit of attracting investors. Therefore, the team programmed for 48 hours straight, which resulted in a functioning demo in the form of an MVP. According to Emil this felt “nice”.

One of the factors causing this incident to happen was the clear distribution of tasks. Emil notes that everyone focused on different aspects, yet saw the importance of each others’ diverse efforts. According to Emil, the incident resulted in a couple of happy investors and the team being satisfied with what they had achieved in such short time.

1.1.1.11 Negative incidents at Saltonsoft, where engineers and marketers worked together, but were not very successful in product development

Marketing Axel: leadership through clear goals

In Axel’s negative incident, the main problem evolved around the fact that the some of the approaches to the technology were overly complex and consumed many working hours without causing visible progress.

One of the main factors contributing to this negative experience was, according to Axel, insufficient leadership. More specifically, the head developer, who is supposed to provide guidance for the rest of the developers, knew how to spend his time wisely without overdoing things, whereas the other developers, on the contrary, did not have as much experience. Instead, they got the impression that the low-level solutions were very important and ended up focusing the wrong things. In sum, Axel saw tendencies of developers working on things that they would not have worked on had they known, where the company was heading. One aspect complicating the detection and avoidance of this kind of problems was that it is difficult for non-developers to tell a productive developer from an unproductive developer in the shorter perspective, since it always looks like a developer is producing something when he is coding. According to Axel, this lack of transparency is particularly evident in situations, where the developer is working on low-level solutions, which are small pieces of the whole product development process.

However, Axel believes that one way to mitigate the risk of repeating this unsuccessful cross-functional incident, apart from installing clear goals and better leadership, is to ensure sufficient communication, both in terms of quality and quantity. On the more general level, Axel believes that at the time this incident happened too few routines were put in place.

Marketing Oscar: learning by doing

Oscar finds it difficult to pinpoint single “failures”, because a lot of the events and actions that are not so successful per se result in valuable insights that lead to success later on.

A not very successful incident was, however, when Saltonsoft focused too much on building the “perfect product” before showing it to prospective customers. In Oscar’s opinion, it would have been useful if Saltonsoft had a “plan B” that could be put into action when it became clear that the original plan was not going to work out the way it was supposed to. One of the reasons causing this event to happen was, according to Oscar, the fact that Saltonsoft engages in a lot of R&D, where the team is talented, but not very experienced. Moreover, the situation became even more problematic as the person in charge of development, who “ran the show” applied a very self-confident leadership approach. To be more specific, the “leader” knew, what he was doing, and did not declare any specific plan for development to the team. However, for the rest of the team, who had less experience, the lack of a plan made the development process extremely difficult.

Engineering Arvid: a no-go to “go-to-guys”

Arvid is hesitant to refer to cross-functional team incidents less successful, as the team has always learned from the negative experiences. However, one situation that comes to his mind is an incident involving great difficulties in aligning team members in terms of a shared vision and goals. The main reasons for this shortcoming was, on the general level, lack of processes in place in terms of communicational routines etc. For Arvid personally the reason for this incident to happen was that he had no experience of programming in a team.

As a result, the developers “walled themselves in” and concentrated on their narrow tasks without discussing the holistic perspective or understanding the targets. What made matters worse was the existence of “go-to-guys”, who became specialists responsible for very distinctive areas and, thereby, irreplaceable in the product development process. Later on the concept of “go-to-guys” was abandoned as a consequence of the learning from the negative incident.

The situation was resolved when Arvid started to embody the role of the project leader and, thereby, get more involved into what everybody was doing. As a result, the developers became much more productive.

Engineering Felix: estimate the time wisely

Felix claims that unsuccessful teamwork usually results from improper iteration planning, which tends to be caused by the team not being fully staffed when the planning is conducted. As a result, the valuable input from the absent team members is not taken into account.

According to Felix, another factor usually causing the “failure” incidents to happen is poor time estimates, which is not very surprising, as exact estimates are impossible to conduct due to the level of complexity of software development projects. The main result of the unsuccessful incidents is delays in the product releases.

Engineering Joel: communicate and plan to make investors happy

Joel notes that one unsuccessful cross-functional team incident happened when the marketers failed to realize, how far the developing team had come with regards to product development and, as a consequence, made unrealistic promises to investors and users. According to Joel, the factors leading up to this event were bad planning and insufficient communication between marketers and engineers. More specifically, Joel concludes that at the time of the event there were not enough routines in place to support communication. He believes that this has changed today, as the company learned from its mistakes and has installed a better structure and routines.

Engineering Emil: make implicit functionality explicit

The negative incident that came to Emil’s mind happened when the marketing was looking for investors. However, as the technical team was not totally aware of what the marketers were communicating, certain product features and functions have been overpromised to customers.

Emil claims that insufficient communication was the main cause for this negative event, which, in turn, resulted from much of the functionality of Saltonsoft’s product being implicit. According to Emil, the developers tend to forget to communicate certain things that appear obvious to them to the marketers, and, thus, gaps in communication are not easily discovered.

Emil concludes with saying that the incident was resolved as the team “fixed the things that needed to be fixed”, which is the central part of the agile way of working. Today the team has improved its performance, which Emil believes partly to be the result of the changed location structure: before the developers were located in a separate dark room. Currently,

however, they have moved and are now co-located with marketing, which enables more straightforward communication.

	Oscar	Axel	Arvid	Felix	Joel	Emil
<i>Clear roles</i>	Yes, made clear throughout the interview.	Yes, made clear throughout the interview.	Yes, made clear throughout the interview.	Yes, made clear throughout the interview.	Yes, made clear throughout the interview.	Yes, made clear throughout the interview.
<i>Validated learning</i>	Yes, mentioned in both negative and positive incident.	Yes, mentioned in both negative and positive incident.	Yes, mentioned in the negative incident.	Yes, mentioned in both negative and positive incident.	Yes, mentioned in the negative incident.	Yes, mentioned in the negative incident.
<i>Presenting prototypes</i>	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.	-	Yes, mentioned in the positive incident.
<i>Recognition of the value of integration</i>	Yes, mentioned in the positive incident.	-	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.
<i>Communication and feedback</i>	-	Yes, mentioned in the positive incident.	Yes, mentioned in both negative and positive incidents.	Yes, lack of it led to the negative incident.	Yes, lack of it led to the negative incident.	Yes, lack of it led to the negative incident.
<i>Interdependence</i>	Yes, mentioned in the positive incident.	-	Yes, mentioned in the general interview.	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.
<i>Decision Making and Planning</i>	-	Yes, mentioned in the positive incident.	Yes, mentioned in the interview about lean.	Yes, mentioned in the positive incident.	Yes, lack of it led to the negative incident.	-
<i>The role of outside pressure</i>	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.	-	-	Yes, mentioned in the positive incident.
<i>Clear goals</i>	Yes, mentioned in the positive incident.	Yes, their absence led to the negative incident.	Yes, mentioned in both negative and positive incidents.	-	-	-
<i>Leadership</i>	Yes, lack of it led to the negative incident.	Yes, lack of it led to the negative incident.	Yes, lack of it led to the negative incident.	-	-	-
<i>Shared understanding of customers</i>	-	Yes, mentioned in the interview about lean.	-	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.	-

	Oscar	Axel	Arvid	Felix	Joel	Emil
<i>The understanding of agility</i>	Yes, mentioned in the interview about lean.	-	-	Yes, mentioned in the positive incident.	-	Yes, it helped to resolve the negative incident.
<i>Degree of formalization</i>		Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.		
<i>Degree of centralization</i>	-	Yes, mentioned in the interview about lean.	Yes, mentioned in the positive incident.	Yes, mentioned in the negative incident.	-	-
<i>Degree of complexity</i>			Yes, mentioned in interview about development processes		Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.
<i>Both marketers and engineers meet with the customer</i>	-	Yes, mentioned in the interview about lean.	-	-	Yes, mentioned in the positive incident.	-
<i>Early involvement of both engineers and marketers</i>	Yes, mentioned in the interview about development processes.	Yes, mentioned in the interview about development processes.	-	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.	-
<i>Proximity</i>	-	-	Yes, mentioned in interview about development processes	-	Yes, mentioned in interview about development processes	Yes, it helped to resolve the negative incident.
<i>Joint reward systems</i>	-	Yes, mentioned in the positive incident	-	-	-	-
<i>Risk encouragement</i>	-	Yes, mentioned in the positive incident	-	-	-	-

Table 7: Overview of factors identified at Saltonsoft.

7.2 Interviews at Truecaller

7.2.1 Presentation of Truecaller

1.1.1.12 General information about Truecaller

Value proposition

Truecaller's vision is to make it easier for the people around the world to get in touch with each other.

Truecaller offers a product that can be described as a trusted collaborative global phone directory in a form of an application for several platforms and a website. Truecaller is the first product that enables people to easily search for any number, both in a public and private directories, worldwide. It is especially valuable in such countries, as India, where there are no official public phone directories, which made the Truecaller application go viral there. The phone directory of Truecaller grows as users enable the "advanced search" function, which then automatically uploads their contacts to Truecaller's cloud servers. The application helps to identify the callers' numbers, which otherwise would have been displayed as "unknown". The service also allows the community to "mark" spam callers, so that any user they are trying to reach is warned in advance. There is also a unique feature of "name search", which enables users to send contact requests to the people they are trying to reach.

Development stage

Truecaller was founded in 2009 and employs 20 people at the moment.

Customer segments

Truecaller targets the users of smartphones, who want to find and filter phone numbers more easily, especially in the countries where public phone directories do not exist.

Truecaller's service gets better with every new user updating his contacts to the server, since this is the way its global database grows. Such close dependence on the customer base makes a very strong orientation towards customer satisfaction a must. Therefore, at Truecaller a lot of emphasis is made on engineer-marketer collaboration in order to make sure the communication to the customers is done properly and to enhance the customer experience.

Lean orientation

The company is constantly evolving and there are new challenges, such as different software bugs, that need to be solved quickly every day. At the same time, everyone in the company has to have a big picture and be updated on all the changes in the product, because all the processes are interdependent. Therefore, a lot of attention at Truecaller is paid to being very efficient in product development and cross-functional communication, which is why Truecaller considers itself lean.

1.1.1.13 Operational environment and development processes at Truecaller

Since the product is very innovative, a lot of new problems have to be solved, starting from legal restrictions to the proper communication. Users tend to explore the features of the product gradually: all users immediately appreciate identification of spam callers, but it takes time for them to discover the key feature - finding numbers that were not in their contact list – and to start uploading their contacts. Thus, Marketing Jesper emphasizes that it is extremely important, how the new features and functionality of the application are communicated: phrasing makes a big difference. Marketing Jesper is working very closely with Engineering Marcus, who is Release manager responsible for the development process and could be called the connecting link between marketing and product development.

Both Marketing Jesper and Engineering Marcus underline the importance of internal and external communication in their business. Engineering Marcus believes that the good thing about being a small company is having an ability to discuss issues on daily basis. He notes that everybody at Truecaller is located in one open space area, which makes the communication very easy. Thus, there is no major division between departments, and there is constant communication between developers, support functions, testers, and marketers. At Truecaller it is believed that everything should be discussed together, so that different perspectives are always considered. The CEO is also always present in the office, which also fosters communication.

The communication is done in several ways. There are cross-platform meetings held every week or even several times a week, where developers, support, marketing and founders get together and exchange the information. It helps a lot to have good communication to the customers, because everyone then has the same information. Such meetings are targeted for 15 minutes, but generally they take up to 20-30 minutes. They are aimed at giving general answers and offloading everyone, specific questions are taken individually after the meeting.

Engineering Marcus makes sure that everyone understands, talking to “farmers in a farmers’ language”, same as the info going to customers is “translated” in those cross-platform meetings.

They also have learning-by-doing: when a release is done, it is Engineering Marcus’ job to give this information to everyone else, because the customers might have questions about it. Thus the support and marketing get materials explaining how to use the features.

Engineering Marcus mentions that a lot of feedback comes through marketing from the social media channels (Facebook, Twitter, Tumblr, etc.). However, he notes that sometimes such feedback is impossible to implement because of platform or legal restrictions. In case it is possible to implement, Truecaller looks into its business value: how to get better data on this and increase value of what they are doing. According to Engineering Marcus, the value is seen from the viewpoint of the consumer, but also of the company to ensure its survival.

1.1.1.14 *Lean processes at Truecaller*

Marketing Jesper clarifies that the process of developing new features is such that everybody in the company gets together for a brainstorming session to discuss what is important for user experience. There is always a concrete question for the session, for instance, “How can the app be made more viral?”. Everybody then thinks for about two minutes and comes up with as many new ideas as possible individually. Then all the ideas are gathered, put on a whiteboard and grouped according to their type. After that voting is held, where the ideas are classified into “low-hanging-fruit”, implementation of which can be done quickly, and into “the most vital”, which Truecaller really believes in. In that way prioritization is made, in what way the features should be implemented.

After the brainstorming session, it is Engineering Marcus’ task to document it and put it into “feasibility stage”, where the developers and he together look at the ways of how to implement the changes. Then the new features are taken to the development step and introduced to the client (Android, etc.), and after the backend and frontend are completed, it is launched and published. When it is published, it is the responsibility of Engineering Marcus to fully inform Marketing Jesper about how this feature functions, its benefits and so on, so that he can deliver this information to the users and the journalists. And vice versa, sometimes Marketing Jesper has the information about what features the users want to see in the application, which is then brought into brainstorming or feasibility stage, where it is

decided, whether this can be achieved and how. Such sessions are both scheduled and ongoing.

After a feature is developed, a beta-version is released and tested on the market. If there is feedback from the market, it is integrated into the final product version.

Engineering Marcus believes that Truecaller is very quick in getting something from the “idea” to “done” stage. Sometimes it takes a day, sometimes an hour. However, usually the process of implementing changes takes from a week to two weeks. Marcus considers Truecaller lean because of being quick in development from a concept to a finished product and very observant of the market’s developments.

Marketing Jesper also notes that being a startup, Truecaller can really implement changes and adapt to the market very fast, since the team is quite small, there is no bureaucracy and decisions are made very quickly. Marketing Jesper believes that this decision-making efficiency is what distinguishes Truecaller from other companies and startups.

To sum up, the lean feedback process employed at Truecaller is displayed graphically in the figure below.

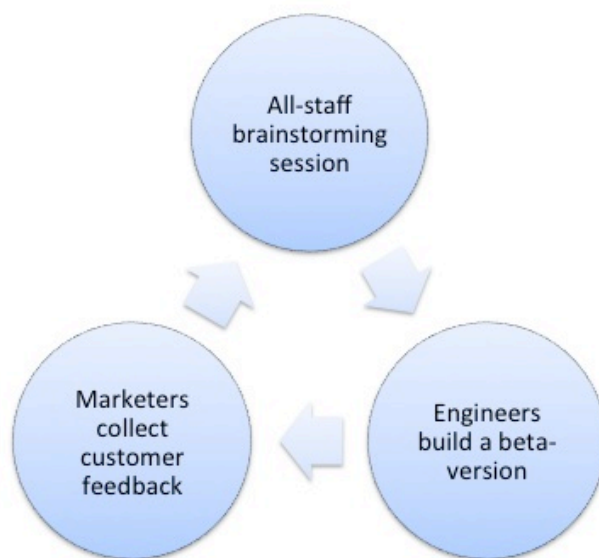


Figure 6: The primary lean processes employed at Truecaller.

7.2.2 The critical incidents at Truecaller

1.1.1.15 *Positive incidents at Truecaller, where engineers and marketers worked together and achieved success in product development*

Marketing Jesper: involving everyone for increased user experience

Jesper talks about one of the brainstorming sessions mentioned in the previous section, where everybody was involved, from the support to the office manager. The goal of the brainstorming session was to make the app more viral. The outcome of the session was extremely good. Several decisions had been made about the design of the app, such as implementing the “like” button in the right place and asking customers for review at the right stage. Another feature that was decided upon was push notifications: if a user does not use a function for a month or has not used it at all yet, he gets push notifications to remind him that such feature exists. The result of the implementation of the push-notifications was the increase in monthly “likes” on Facebook by 120%.

Jesper mentions that the main criterion for making changes to the app at Truecaller is that everything should make common sense and increase the user experience. Implementing even small changes that enhance user experience can increase the application popularity a lot.

Jesper concludes that the deciding factor for success of the brainstorming sessions is that everybody was involved. He believes that it is very important to compliment marketing with technical expertise. Moreover, even the office manager, who does not have much insight into marketing or product development, compliments the discussions with common sense and user experience. Thus, feedback from everybody in the team is extremely important.

Engineering Marcus: no accidental discoveries, but a lot of hard work

Marcus believes that an incident of successful collaboration happened when Truecaller developed a new version of the application, introducing a function called “name search”. Truecaller’s view was that the users could search for any number in the world. It was the time for everyone in the company to work together.

Marcus clarifies that the success of this project was obvious, because this feature had been asked for by the users for a very long time. However, there were still privacy restrictions that had to be taken into account: the user has to confirm that the other party can get his number. That is why it was very important for marketing to explain these restrictions to

customers in the right way. The key was to not get people scared off by those restrictions, but rather motivated to use the new feature and excited about it. The ongoing development process would be very hard to be made useful and understood, if the marketing team did not do their job well and communicate the changes to the customers in the right way. In this case marketing “told the story”: created a video and made snippets to show, how the new function was to be used on Instagram, Facebook, Twitter. The feedback from the users was immediate and very positive, and the usage has grown thanks to the communication part. Thus, the brainstorming session resulted in a very successful release, introducing a new way of monetizing. Marcus notes that it is especially crucial that the paid features are explained very well, along with why they need to be paid for, because users tend to expect that everything should be free.

This is the process that Truecaller tries to repeat every time a new feature is developed.

To conclude, Marcus believes that without people being experts in their areas this success would never have happened. It was not an accidental discovery leading to success, rather a lot of hard work done by everyone. Being cross-functional and being able to constantly communicate with each other and have everyone on the same page made it work.

Engineering Mats: making the users happy all together

Mats told us about an incident when it was decided to implement a new feature called “Profile” in the application. In order to create this feature, the development team had to know, how a profile should appear to a user. The team was briefed by marketing, received the documentation from the Release manager and got working on the “front end”. Once completed, the development team demonstrated the new feature to the Release manager and to the support and marketing team, who could then ask questions and make remarks. After this discussion, Release Manager together with marketing prepared materials for the end users that would help them to understand and troubleshoot any problems that might occur.

Mats notes that the team all together managed to make a very successful release of this feature and that everybody in the team was happy to see users’ reaction to what they had created. In Mats’ opinion, the main reason for this success was that the development team was able to demonstrate the application and gather feedback at an early stage.

1.1.1.16 *Negative incidents at Truecaller, where engineers and marketers worked together, but were not very successful in product development*

Marketing Jesper: missed chance to communicate to the user

Jesper cannot think of any specific incident. He thinks it is rather that everybody in the company is so used to seeing a lot of things happening all the time, so that people sometimes forget to communicate decisions to each other. For example, if the CEO wants to see, whether lowering the cost of credits can boost sales, but forgets to tell marketing, which could then communicate the changes to the users, no effect will be seen. However, it is a simple human mistake that is hard to avoid. Everybody tries to document things, but sometimes it is hard to keep track. Sometimes people just make a bad judgment that some small changes do not matter, when they actually do matter.

Jesper explains that, in order to avoid these kinds of mistakes, there are certain instruments in place. For instance, the brainstorming sessions are scheduled regularly, and there is a tool, where the progress of the changes is reflected. Also every Monday cross-platform meetings are held, where the developers go through what is going on in the development and the support person updates on the most common bugs and on what is “burning right now”. Such meetings are simple, but extremely effective.

Jesper concludes by saying that the mistakes that are outlined above are not critical, but rather a missed opportunity to communicate to the user that progress is happening.

Engineering Marcus: communicate and keep the customer satisfied

Marcus cannot think of a specific incident, but notes that, although Truecaller is a very small team, there are still some difficulties in communication. Being a small team and very agile, anyone can make a change, be it in price, communication, or in features. Sometimes it has happened that not everyone had the same information and then got unexpected questions from the customers. Communication is where Truecaller experiences the most issues that are under its control (as opposed to external issues, such as server outages).

Marcus believes that such incidents result in confusion. Especially from the customers' side: they then need more clarification. However, because of such incidents application was not perceived worse in any ways, and the team was very responsive when it happened to make the customers satisfied and to compensate for it in a way.

Since Truecaller lives mostly on its reputation, it has to make sure the customers remain happy. So if there is an issue, they make sure it is solved and explained properly.

Engineering Mats: solving issues through closeness and communication

Mats also cannot think of any specific incident. He just notes that sometimes it happens that the specifications for the features are not fully delivered to the development team, which makes the implementation somewhat harder. However, Mats notes that any issues that occur in connection to these incidents are resolved within the team quite fast due to the efficient communication at Truecaller and physical proximity of everyone in the team.

	<u>Jesper</u>	Marcus	Mats
<i>Communication and feedback</i>	Yes, lack of it led to the negative incident.	Yes, mentioned in both the positive and the negative incident.	Yes, lack of it leads to the negative incidents, but problems also get resolved through communication.
<i>Degree of formalization</i>	Yes, some routines are mentioned in the negative incident.	Yes, some routines are mentioned in the interview about lean.	Yes, mentioned in both the positive and the negative incident.
<i>Degree of centralization</i>	Yes, mentioned in the interview about lean.	Yes, mentioned in the interview about lean.	Yes, mentioned in the positive incident.
<i>Degree of complexity</i>	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.
<i>Proximity</i>	Yes, mentioned in the interview about lean.	Yes, mentioned in the interview about lean.	Yes, mentioned in the negative incident.
<i>Recognition of the value of integration</i>	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.
<i>Presenting prototypes</i>	Yes, mentioned in the interview about lean.	Yes, mentioned in the interview about lean.	Yes, mentioned in the positive incident.
<i>The importance of milestones</i>	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.
<i>The professionals try to understand each other's point of view.</i>	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.
<i>Early involvement of both engineers and marketers</i>	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.
<i>Failure tolerance</i>	Yes, mentioned in the negative incident.	Yes, mentioned in the negative incident.	Yes, mentioned in the negative incident.
<u>Interdependence</u>	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.	Yes, mentioned in the positive incident.
<i>Decision Making and Planning</i>	Yes, mentioned in the interview about lean.	Yes, mentioned in the interview about lean.	Yes, mentioned in the positive incident.
<i>Shared understanding of customers on part of the engineers</i>	Yes, mentioned in the interview about lean.	Yes, mentioned in the interview about lean.	Yes, mentioned in the positive incident.

Table 8: Overview of factors identified at Truecaller.

8 Analysis

In this section we have analyzed our results from both case companies presented in the previous section and, thereby, identified factors that, we argue, influence the cross-functional collaboration achieved in our case companies. We will not, however, present all the answers with regards to the same factor, but rather exemplify each identified factor with the most exemplary answers. A complete presentation covering all the participants' answers within a certain factory category is provided in the appendices (see "Grouping of identified factors")

8.1 Identifying factors influencing the marketing-engineering integration

In the following section are going to identify factors that recurred during the CIT sessions in relation to the positive and negative cross-functional team incidents or that were touched upon during the more general interviews. We argue that these factors influence the marketing-engineering integration actually achieved within our case companies. Our theoretical framework has been used to classify the majority of these factors. In the cases where the framework failed to cover an identified factor, it has been extended by self-made categories, referred to as "Additional Factors". What is more, factors that were not touched upon by a reliable amount of interviewees, 3 for Saltonsoft and 3 for Truecaller, will not be analyzed. Finally, since the factors, the lack of which led to negative critical incidents, were the same factors that improved the situation and caused the positive incidents to happen, in the analysis we focus mainly on portraying the factors that contributed to the incidents, where the cross-functional collaboration in our case companies was successful.

8.2 Factors identified that can be classified according to the first part of our theoretical framework

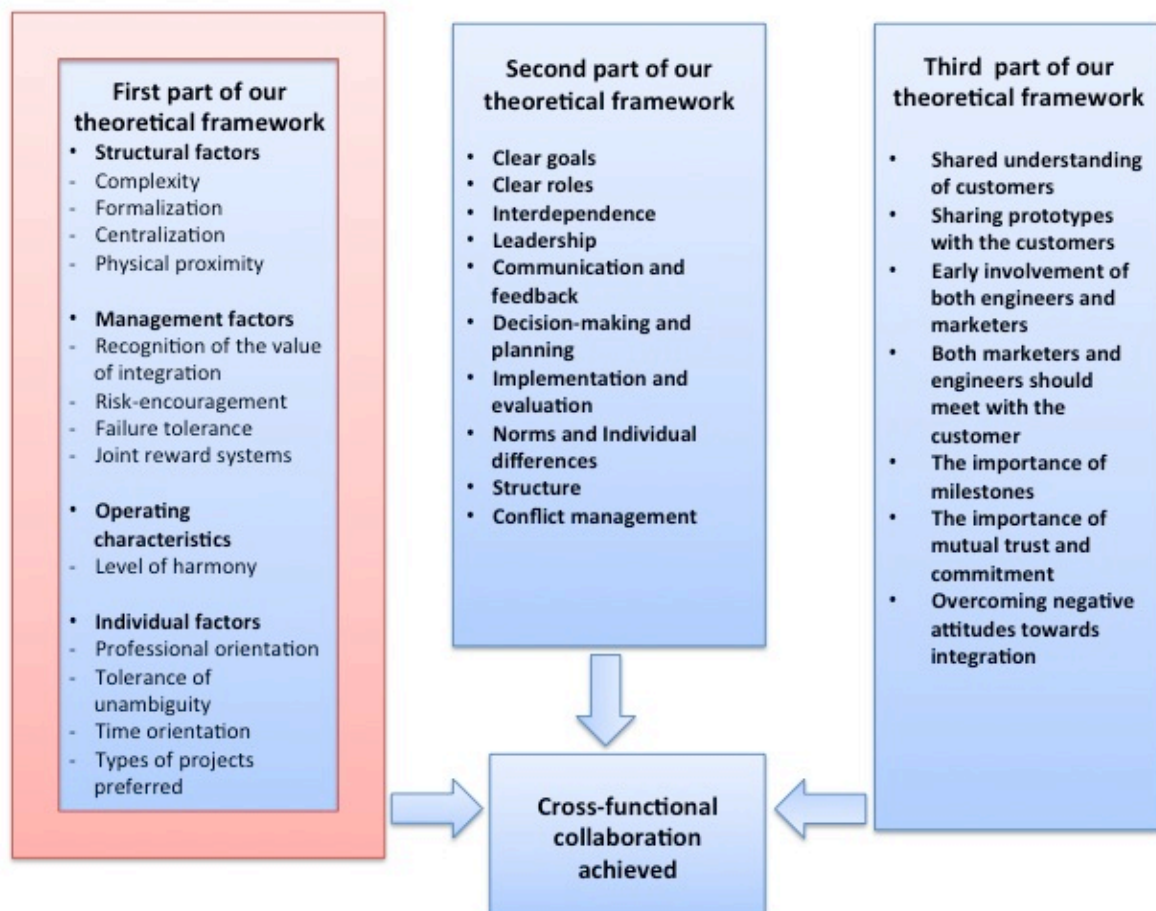


Figure 7: The first part of our theoretical framework.

In the following, we will present our analysis concerning the identified factors categorized according to the first part of our theoretical framework (see the red-marked area). Before each presentation, a short summary of the implication of the factors according to the framework will be provided in order to facilitate our analysis from the perspective of the reader.

Structural factors

A lower degree complexity, formalization and centralization, together with physical proximity between engineers and marketers contribute to a higher degree of integration actually achieved between the two professions.

As Saltonsoft is a startup firm employing only 6 people, the *degree of complexity, formalization and centralization* becomes automatically relatively low, compared to the

degree prevailing in larger, more mature organizations. This reasoning is supported by Henry Mintzberg's structural configuration theory, as Mintzberg states that, when an organization grows larger in terms of its number of employees, it also becomes more complex, formalized and centralized (Mintzberg, 1983).

Complexity is argued to be dependent on the number of functions and specialists employed within the organization, meaning that more functions and specialists entail a higher degree of complexity. Due to the small amount of people working at Saltonsoft and Truecaller (6 and 20 employees respectively), the *level of complexity* becomes automatically low. From the CIT sessions we have identified factors that support the argument that a lower degree of complexity facilitates integration. For example in the case of Saltonsoft, the team engages in "team programming", which Engineering Arvid portrays as an important tool for getting everyone on the same page. At Truecaller the decisions about new features are made in brainstorming sessions, where every team member participates. Such routines involving every employee would not have been feasible within organizations employing multiple specialists and functions.

Formalization and centralization imply, as presented in the framework, that the company has explicit rules and procedures together with the decision-making taking place at a high level within the organization, involving only very few participants. For Saltonsoft, although more or less all the employees, in different ways, mention that a higher degree of formalization has helped the company to improve its daily operations, in terms of, for example, better planning (iteration planning), better behaviors and more routines (scrum meetings), we do not regard Saltonsoft as a formalized company using the connotation of formalization as presented in our framework. Instead, we perceive the formalized elements at Saltonsoft as being on the lower *level of formalization* compared to many other organizations; thus, the higher degree of formalization that the interviewees refer to is concerned with going from no formalization to some formalization.

At Truecaller there definitely are formalized processes in place, such as weekly cross-platform meetings and tools, where the progress of product development is reflected upon. However, it is revealed in all the interviews that the *level of formalization* is still quite low, since, for instance, the whole team resolves problems, as soon as they arise, in an informal manner. In both case companies we have identified factors that support the assumption that a low degree of formalization is positive from the perspective of cross-functional integration.

For example, in Saltonsoft the absence of formal “go-to-guys” have proved to be a success factor for the team and also, Marketing Axel states that the behaviors that the company seeks to encourage are the ones that feel natural for the employee. At Truecaller, communication free of hierarchical boundaries is an explicit objective, which Marketing Jesper and Engineering Markus highlight as an important prerequisite for creating a high-performing team.

As far as the *centralization* goes, even though it is primarily the founders at Saltonsoft that make the decisions on behalf of the company, the founders constitute 50% of the staff (Saltonsoft has 3 founders and employs 6 people). Additionally, Marketing Axel, when confronted with the question “What makes Saltonsoft a lean startup?”, states that the culture at Saltonsoft is not a “yes-culture”, but rather a reflective culture, where everybody can question any action before it gets executed. Taken together these circumstances imply that Saltonsoft is not centralized according to the aforementioned definition of centralization, where decisions are taken at high hierarchical levels with only few participants. Instead the employees at Saltonsoft get the opportunity to participate in the decision-making process, which is mentioned as an important factor in relation to several of the critical incidents. Engineering Felix argues, for instance, that flawed decisions made at the iteration planning meeting, often are the results of incomplete staffing, which in turn implies that valuable input from some of the employees gets left out of the decision making process.

In spite of its slightly larger organization (20 versus 6 people), Truecaller has the same *level of centralization* as Saltonsoft, which is supported by the fact that the company has an all-staff decision-making process, where everybody’s opinion matters. What is more, in every single interview conducted at Truecaller it is strongly underlined that all the decisions impacting the product development process are made collectively by the team. This democratic approach is employed in order to get different perspectives on the decision at hand, as well as in order to compliment each other’s knowledge. Therefore, we can conclude that the level of centralization at Truecaller is extremely low, which is one of the success factors with regards to the cross-functional integration within the organization.

The last structural factor as presented in our theoretical framework is the role of *physical proximity*, where integration is more easily achieved when the marketers and the engineers are physically co-located. Both at Saltonsoft and at Truecaller, all employees are currently placed in one open-space area, which, according to Engineering Emil, Marketing Jesper,

Engineering Marcus, and Engineering Mats, enables more straightforward communication between marketers and engineers.

Summary of analysis: Saltonsoft's and Truecallers's low degree complexity, formalization and centralization, together with the physical proximity between the engineers and marketers add to a higher degree of integration actually achieved between the two professions. A contributing circumstance causing the limited level of complexity, formalization and centralization stems from the fact that the organizations are comprised only of 6 and 20 employees.

Management factors

Recognition of the value of integration, risk-encouragement and failure tolerance, in combination with a joint reward system, contribute to integration actually achieved between the two professions.

The *value of integration* seems to be rather explicitly recognized within both companies, as most of the employees talk about the importance of being on the same page and of synchronizing their efforts across professions. For instance, at Truecaller, Engineering Marcus even notes that the development process would not be useful, unless the marketing team updates the customers on the progress in a suitable way. Marketing Oscar at Saltonsoft expresses a similar point of view in relation to his successful team incident, as he states that the building of the MVP would not have been feasible if it was not for the joint efforts of his team.

As far as a *joint reward system* goes at Saltonsoft, Marketing Axel states that small victories along the way should be celebrated within the team in order for the employees to remain motivated. This indicates that if there is a reward, everyone is entitled to it, which is rather natural when there are only 6 employees co-located within the same office. The factors, referred to as "*risk encouragement*" and "*failure tolerance*" at Saltonsoft, were neither touched upon during the initial interviews with the founders, nor by a reliable number of interviewees in the CIT sessions and for this reason we cannot determine, to which degree Saltonsoft is tolerating risk-taking and failures. The only person commenting on factors close to these factor categories was Marketing Axel, who stated that his positive incident was a result of the product developers taking initiatives and thinking outside the box. However, as mentioned earlier, we do not intend to present factors that were touched upon by less than 3 Saltonsoft interviewees.

As for Truecaller, Marketing Jesper talks about situations, where lack of internal communication led to miscommunication to customers. However, he regards this misconception as a missed chance to talk to the customers rather than as a crucial mistake. Engineering Marcus, in turn, shares the view of Marketing Jesper and adds to it that the confusion among the customers, caused by the poor internal communication, was remedied by compensation. This way the company managed to keep the favorable perception of the application Truecaller is offering intact. Thus, we believe that *failure tolerance* at Truecaller is quite high, probably caused by the amount of adjustments done to the application on a daily basis. The factors, referred to as “*risk encouragement*” and “*joint reward systems*” were not explicitly touched upon and for this reason we cannot determine whether they are present or absent at Truecaller.

Summary of analysis: All employees at Saltonsoft and at Truecaller seem to recognize the value of cross-functional integration with regards to product development. Saltonsoft presumably employs joint rewards amongst marketers and engineers. Truecaller also appears to have a culture that is rather tolerant to failures. All these circumstances have been identified as contributors to integration achieved between the two professions at the companies.

Operational character factors

When marketers and engineers are involved early on in the project and understand each other's viewpoint, together with potential conflicts being resolved at the lowest organizational levels, it is argued that the integration actually achieved between the two professions is enhanced. What is more, integration is more easily achieved when issues related to it are discussed rather than accepted.

When Marketing Arvid and Marketing Oscar, who are also two of the founders of Saltonsoft, were asked to describe, what makes them lean, they explained how they collect customer feedback, which goes into the product development process through weekly meetings attended by the three founders. After this meetings Marketing Oscar meets with the developers to break down the priorities to the weekly level, so that everyone knows what is to be done the coming week. All interviewees at Truecaller describe a similar way of working when they explain that everybody is involved in the decision-making process regarding which features to implement, although it is up to the developers to decide, how to implement the features. We perceive this as a clear indication of the fact that *both marketers and engineers are involved in the process from the very beginning.*

As far as *understanding each other's viewpoints* go, the way Saltonsoft has implemented the lean startup concept implies that, first of all, (1) the customer feedback is made very explicit, which, of course, leads to a higher degree of shared understanding for the customer "pain". Secondly, (2) Saltonsoft plans on involving the engineers to an even greater degree through allowing them to attend customer meetings, where the feedback is collected. Lastly, (3) in the context of the question "What makes Saltonsoft a lean startup?" Engineering Arvid mentions that he has introduced "team programming", where the whole programming team gets together and works on the same code collectively. Also, at the point of the code freeze, towards the end of each iteration, the whole team works together on fine-tuning the product. In sum, one can say that Saltonsoft has no "go-to-guys", but rather strives for making, more or less, everyone capable of performing each other's tasks.

As for Truecaller, all the interviewees talk about the importance of keeping each other updated about any changes that have been made. For instance, Engineering Marcus notes that constant communication across professions in combination with having everyone on the same page led to his successful cross-functional team incident. Moreover, he also states that everybody should have an understanding of what the rest of the team is doing, which is a clear indicator of that fact that the company is constantly striving to improve their *understanding of each other's viewpoints*.

When it comes to "*potential conflicts being resolved at the lowest organizational levels*", once again, the fact that Saltonsoft and Truecaller only employ 6 and 20 people automatically enforces such conflict management. However, we have not explicitly identified any factors indicating, whether the fact that conflicts are being resolved at a "grass root level" have contributed to cross-functional collaboration or not. For this reason, we will not regard this factor as a prominent within this context. Furthermore, we have not investigated if *issues related to conflict are discussed rather than accepted*, which is why we can neither say if this factor is prevailing in our case study companies, nor determine, whether it has contributed to integration.

Summary of analysis: The marketers and engineers at Saltonsoft and at Truecaller are collectively involved early on in the product development process and they also direct much effort towards establishing an understanding of each other's viewpoints. These two circumstances have been identified as contributors to the cross-functional integration achieved. The fact that the organizations only employ 6 and 20 people automatically enforces

conflict management at the lowest organizational levels. However, we have not identified any factors indicating, whether the fact that conflicts are being resolved at a “grass root level” have contributed to cross-functional collaboration or not.

Individual factors

Interpersonal similarities in terms of similar professional orientation, similar tolerance of ambiguity, similar perspective on time and similar projects preferred across the marketers and engineers are claimed to contribute to cross-functional integration achieved.

At Saltonsoft, it turned out that “marketers” had an educational background that covered both business and engineering skills. What is more, the fact, that the marketers founded the company and together with one of the engineers, indicates that, at least 50% of the employees (Saltonsoft employs 6 people), have a genuine interest for the product they are developing. This could in turn be a sign of similarities with regards to projects preferred. We will not elaborate too much on these individual factors though; such analysis runs the risk of becoming somewhat speculative. Therefore, we confine ourselves to noting that we see indications of the employees at Saltonsoft being similar in at least 2 of the 4 individual aspects mentioned in our framework.

In the case of Truecaller, we cannot draw conclusions on interpersonal similarities/differences across the functions within the company, as we have not conducted interviews targeted at depicting such personal background information.

Summary of analysis: We have seen tendencies of similarities between the marketers and engineers at Saltonsoft with regards to educational background and projects preferred. However, as we have not aimed at investigating the reliability of these presumed similarities, we will not elaborate on them in detail. For Truecaller, we cannot draw any conclusions on interpersonal similarities/differences for the reason stated above.

8.3 Factors identified that can be classified according to the second part of our theoretical framework

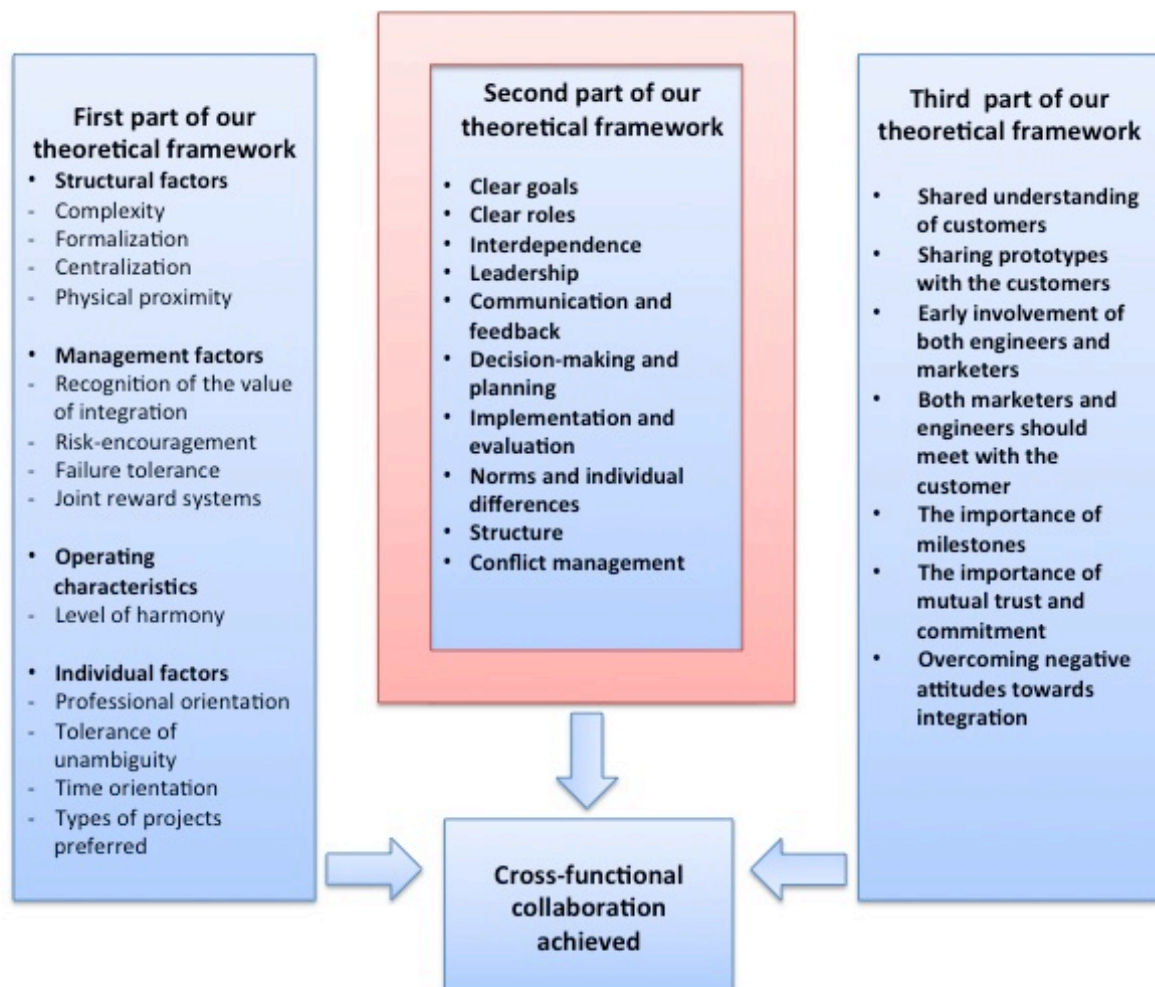


Figure 8: The second part of our theoretical framework.

When a group executes well with regards to the factors in the second part of our framework (see the red-marked area), the group transforms into a team.

In this part of our theoretical framework, *clear goals* are highlighted as significant for the creation of effective teams. Three of the interviewees at Saltonsoft, Marketing Axel, Marketing Oscar and Engineering Arvid, explicitly mentioned, how important it has been for the company to set clear targets for the cross-functional team members in order to make them understand the objectives of the organization. In Engineering Arvid's less successful incident, the lack of a clear goal made people focus on the wrong aspects of product development, which, in turn, made the process unproductive. Marketing Axel refers to a similar situation in his negative case, when he states that if all team members had known

where the company was heading, they would have spent their time and efforts more wisely. Marketing Oscar, on the contrary, mentioned clear goals in relation to his successful incident, as he points out that one important factor contributing to the successful cross-functional collaboration was the existence of meaningful and comprehensive goals. As far as the rest of the team goes, Engineering Felix, Engineering Joel and Engineering Emil, do not explicitly talk about the significance of clear targets in relation to cross-functional teamwork, but they do seem to have an understanding of the objectives of Saltonsoft. For example, all team members of Saltonsoft describe their role within the organization without hesitation and they also seem to have a good overview of how their effort fits into the company as a whole.

As for Truecaller, *clear goals* have neither been directly touched upon during the CIT sessions nor in the more general interviews. Marketing Jesper and Engineering Marcus have rather mentioned implicitly that the goals of the product development process are jointly decided upon through a collective brainstorming session – a decision making routine that ensures that everybody is aware of what the goals are.

Another factor from this part of our framework is *interdependence*, in the sense that members of effective teams understand that cross-functional efforts will beat individual efforts. Almost all of the interviewees show signs of the possession of such insight, where Engineering Felix, Engineering Joel and Engineering Emil at Saltonsoft talk about the importance of synchronizing activities across the marketing and product development functions. Engineering Felix states, for instance, that the lack of proper synchronization can be very costly. Engineering Joel also points to the importance of achieving synchronization through claiming that, unless everyone is on the same page, engineers and marketers have to guess what their colleagues are doing and then hope for a fit with regards to what they have been working on themselves. Engineering Emil is making a similar point when he claims that in his successful incident one factor contributing to the favourable development was the clear distribution of tasks, where everyone focused on different aspects, yet saw the importance of each other's diverse efforts as well. Marketing Oscar and Engineering Arvid make related points through underlining that they understand that success comes from cross-functional efforts.

At Truecaller, every interviewee was very aware of the functional *interdependence* within the company, in the sense that all the negative incidents were described as caused by the lack of cross-functional communication. Moreover, as touched upon earlier, Engineering

Marcus underlines that product development is dependent on the marketing function in the sense that new product features have to be communicated to the customers in an appropriate way. Furthermore, Engineering Mats talks about the importance of receiving proper specifications from marketing that can be executed on within the product development process. Thus, it can be concluded that all functions in the company are very well aware of the interdependence across professions.

Our framework states that applying an appropriate *leadership* style is a fundamental prerequisite for the creation of effective teams. More specifically, the team leader has to adapt, so that he/she meets the emerging needs of the team. Marketing Axel, Marketing Oscar and Engineering Arvid at Saltonsoft all touch upon the importance of installing a leader with the “right” leadership approach. For example, when asked to describe their unsuccessful cross-functional teamwork situation, they all refer to the same event, where the team leader was pursuing a strategy that can be likened to “leading by example”. However, this type of leadership did not work well within this specific context, as the leader was much more experienced than his followers. Or, put differently, the followers could not really tell, what the leader was doing and why he was doing it, and, as a consequence, ended up focusing on the wrong aspects. In light of this experience, Engineering Arvid became to a larger extent involved in what the rest of the engineers were doing and, as a result, the team became much more productive. The topic of *leadership* has not been deliberately touched upon in the interviews with Truecaller, which is why we cannot tell if it has been an important factor from the perspective of cross-functional teamwork.

Communication and feedback is yet another of the keys to team productivity, which refers to the importance of having an open communicational structure involving regular and constructive feedback. All interviewees at Saltonsoft, except for one, explicitly mention sufficient communication as one of the most important success factors in their positive incidents, as well as the lack of communication as the most prominent factor causing their negative incidents. Engineering Emil and Engineering Joel say, for instance, that in their less successful incident, the insufficient communication between market and product development made the marketers overpromise things to the prospective customers. This was, however, not in a pursuit of exaggerating the features of the product, but rather a consequence of the fact that the marketers did not really know what the engineers had completed and what was still to be done. Engineering Felix mentions a similar incident,

when he claims that unsuccessful cross-functional teamwork stems from incomplete staff meetings, where not both parts of the organization (marketing and engineering) are represented. This results, more often than not, in situations where the team forgets about important aspects in the product development process. Marketing Axel talks about how communication helps setting priorities straight among the developers, which has been an important tool for avoiding situations similar to the one, where “leading by example” proved to be insufficient. Engineering Arvid discusses a related communicational aspect, as he claims that one avoids “walling oneself in” only through communicating, which enables both marketers and engineers to see the bigger picture.

At Truecaller, as indicated throughout this whole analysis, *communication* seems to be one of the most crucial factors contributing to cross-functional collaboration. For instance, both Marketing Jesper and Engineering Markus talk about the importance of communicating even the smallest changes with regards to the product or to the product specification. Additionally, Engineering Mats states that any issue that arises is quickly resolved due to effective communication across professions.

Our framework also argues for the importance of discussing *planning and decision-making* amongst all team members, a factor that was mentioned in relation to the successful incidents by 4 of the interviewees at Saltonsoft. Engineering Felix talked about how scrum meetings helped the team to remain on the same page as well as got everyone involved in the process. Engineering Joel also mentioned, how planning in terms of installed routines etc. did strengthen the communication process, which, in turn, proved to be a prerequisite for success. Marketing Axel supports this claim through stating, how important planning has been for the Saltonsoft when it comes to turning it from the negative cross-functional team incident to the positive cross-functional team incident. More specifically, he talks about how one has to plan for the “right” behaviours, i.e. the behaviours that feel natural to the employees.

As mentioned earlier in this analysis, Truecaller has an all-staff decision-making process where everybody’s opinion on features to be developed matters. This democratic approach is described as helpful in relation to the positive cross-functional team incidents.

We could not identify any factors that can be classified with regards to the categories “*implementation and evaluation*”, “*norms and individual differences*”, “*conflict management*”, whereas the “*structure*”, as presented in this part of the framework, has already been

discussed in this analysis (see “Structural Factors” in the first part of our theoretical framework).

Summary of analysis: Clear organizational goals shared by all employees, the understanding of the superiority of cross-functional collaboration, improved communication in terms of quality and quantity between the two professions and, finally, decision-making and planning through discussions are factors that were identified as contributors to integration in the cases of both Saltonsoft and Truecaller. Additionally for Saltonsoft, a more involved leadership style as opposed to only leading by example, also improved the cross-functional collaboration achieved within the organization.

8.4 Factors identified that can be classified according to the third part of our theoretical framework

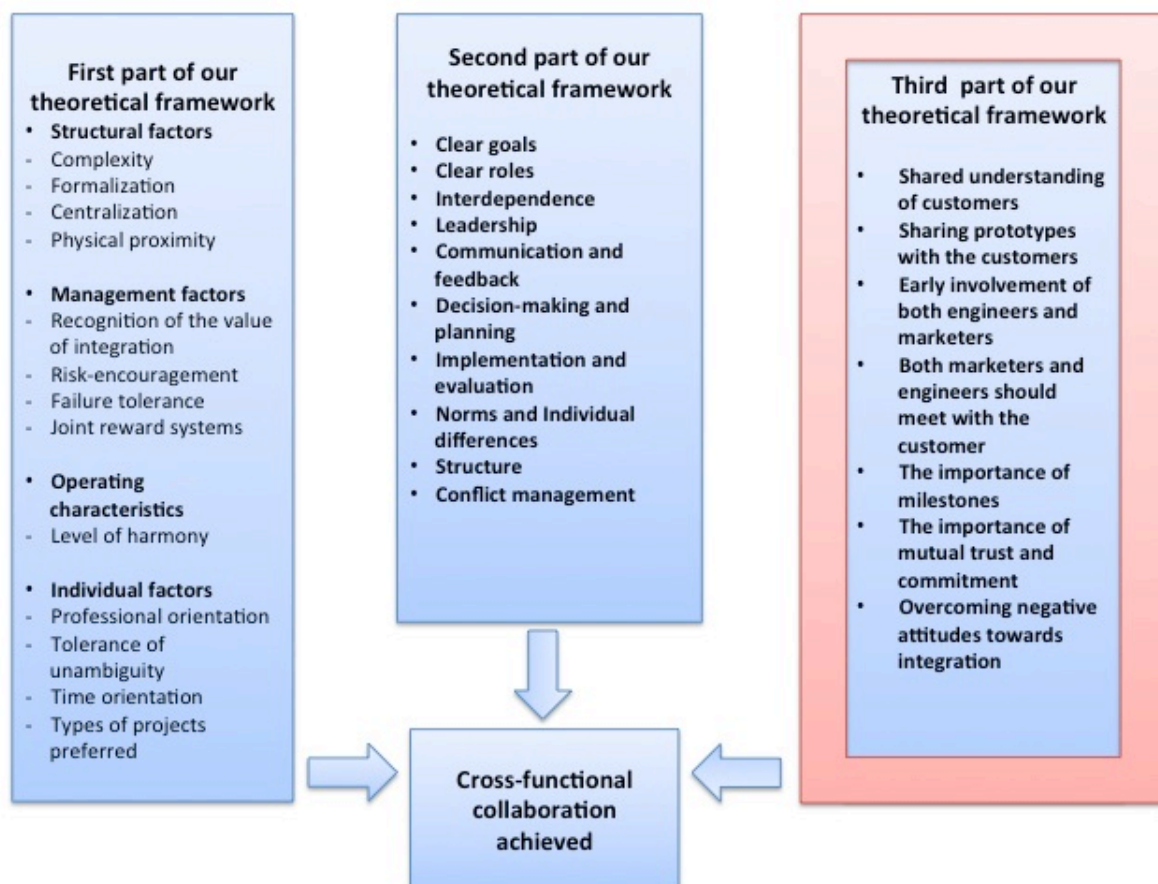


Figure 9: The third part of our theoretical framework.

Executing on the factors presented in the third part of our framework (see the red-marked area) is claimed to contribute to the achievement of successful cross-functional integration between marketers and engineers.

In this last part of our theoretical framework, the importance of a *shared understanding of customers on part of the engineers* is claimed to a prerequisite for successful cross-functional collaboration. The prevalence of this factor was identified at Saltonsoft, as Marketing Axel and Marketing Oscar constantly interact with the customers in the pursuit of collecting their feedback, which then goes into the product development process through weekly meetings. Engineering Felix argues, in turn, that these meetings are very important for the success of the cross-functional teamwork, as the team is trying to build everything from the user experience perspective. Engineering Joel adds to this through explaining the importance of Marketing Oscar's visits to the customers, as he comes back with a list of things that the users are annoyed about or that they like, and this information is then passed on to the developing team through meetings and workshops. The point of these meetings and workshops is for the developers to understand, how they can improve the product from the perspective of the users, which, of course, requires a basic understanding for the viewpoints of the customers.

The same goes for Truecaller, as *customer feedback* is collected by the marketers through the social media channels and then forwarded to the weekly cross-platform meetings, where it is shared with the developers. This process is described as an essential part of the interviewees positive incidents, as, for instance, Engineering Mats mentions, how knowledge about customer preferences was helpful in implementing a new successful feature called "Profile". Marketing Jesper also touches upon the importance of establishing a shared understanding of the customer preferences with regards to successful product development, which was the case when the company was about to implement a "like" button.

The significance of presenting *prototypes* that can be shared with the customers is the second factor that is presented in this part of the framework. More or less all interviewees mention, how the MVP has been a success factor in relation to the cross-functional team performance, both at Saltonsoft and at Truecaller. For example, Engineering Emil at Saltonsoft thinks that the biggest achievement of the company so far, with regards to cross-functional efforts, happened last fall when the team managed to build a MVP. Marketing Axel, Marketing Oscar and Engineering Arvid also refer to this incident in relation to their positive

cross-functional teamwork case. Marketing Oscar states, for example, that the MVP turned out to be a success, to which everyone contributed. Furthermore, he views the incident as a true lean project, where no full product version was built, but where the MVP served as a feedback collector.

At Truecaller the presentation of *prototypes* comes in the form of the company releasing beta-versions as soon as a new feature has been developed. This contributes to the success of product development, as this way the market gets to test the beta version and thereby give valuable feedback. Moreover, in his positive incident Engineering Mats highlights that, in his opinion, the product development was successful in this case because the developers managed to demonstrate a prototype and gather feedback at a very early stage.

Another factor mentioned in the third part of our theoretical framework is the *value of involving both marketers and engineers early on in the process* from the perspective of achieving successful collaboration. From the interviews we get that both Saltonsoft and Truecaller are involving both marketers and engineers in the product development process at an early stage. In both companies everyone is highly aware of the feedback collected from the customers, as well as collective involved in the building of the MVP/beta version.

The factor arguing for the value of allowing both *marketers and engineers to meet with the customers*, in order to enhance their aforementioned understanding of customer preferences could not be identified in any of the cases. However, Saltonsoft, as mentioned earlier, is considering implementing such routine – an idea that receives support from Engineering Joel.

At Truecaller the interviewees talked about success in terms of positive customer feedback in the form of updates on increased app usage and Facebook “likes”, etc.. This type of concrete progress indication was perceived as highly motivating from the perspective of the team as whole and, therefore, we have classified this factor as the prevalence of an understanding for the *importance of milestones* at Truecaller. However, in the case Saltonsoft we did not identify a similar factor, which is why we cannot say, whether it is prevailing or not prevailing within the company.

When it comes to the factor categories “*overcoming negative attitudes towards integration*” and “*the importance of mutual trust and commitment*”, we have not identified any reliable factors in neither of the companies that could be classified accordingly.

Summary of analysis: For both Saltonsoft and Truecaller the establishment of a shared understanding about the customers among marketers and engineers, the presentation of prototypes as well as early involvement of both marketers and engineers in the product development were identified as factors that contributed to the cross-functional collaboration. Additionally, for Truecaller, we could also identify the importance of milestones as a contributor to the integration.

8.5 Additional factors

As mentioned in the beginning of this section, the factors that do not fit into the framework presented above will be grouped according to categories that we find suitable.

In the case of Saltonsoft, one aspect touched upon, explicitly or implicitly, by all interviewees was *validated learning* similar to the type of learning Eric Ries refers to when he argues for the value of demonstrating progress backed up by empirical data (Ries, 2011). As a matter of fact, all negative incidents happened chronologically before the positive incidents and the employees at Saltonsoft testified about how the company had learned from its mistakes and then used this learning in the implementation of organizational improvements. For example, Engineering Felix and Engineering Arvid claim that the lessons learned led to the removal of go-to-guys, whereas Marketing Axel, Engineering Joel, Engineering Felix and Engineering Emil explain, how Saltonsoft has learned and on basis of that learning established the “right” behaviours and routines, co-located the staff as well as introduced scrum meetings and iteration planning.

What is more, three of the engineers at Saltonsoft, in different ways, talk about the value of being familiar with the *agile way of working* – a concept that they learnt about during their engineering education. This is interesting, as some people argue that agility shares similarities with the lean startup concept (Interview with Marketing Oscar, 2013-04-05). In light of this claim, we regard the familiarity with agility as an important factor from the perspective of cross-functional collaboration. Our reasoning goes as follows: if the engineers understand and accept the importance of agility, which has several touch points with the lean startup approach, they are probably more prone to take responsibility for the cross-functional collaboration required by the concept, compared to what would be the case in the absence of such familiarity.

The last additional factor that we have identified when analysing the data from Saltonsoft is the *role of outside pressure*. In 4 of the success stories, outside pressure was the starting

point in the sense that it made people realize that Saltonsoft had to achieve certain targets within a short amount of time. This sense of shared urgency, proved to be an effective coordination mechanism within the cross-functional team and as a result the company performed well. Marketing Axel refers to this situation through stating that the team of developers surprised him, through thinking outside the box in order to meet the approaching deadlines.

At Truecaller there were no additional factors prevalent apart from the ones we have been able to classify in accordance with our theoretical framework.

Summary of analysis: At Saltonsoft, additional factors, i.e. factors that cannot be classified according to our theoretical framework, are following: the developers' understanding of agility, the prevailing "culture" of validated learning and the pressure from the external environment that led to a shared sense of urgency. For Truecaller no prevalent additional factors were identified.

8.6 Combining the identified factors into a framework

After having identified the factors influencing the cross-functional collaboration for the two case companies separately, we will in this part of the analysis combine them into a framework containing only the factors that were identified both Saltonsoft and Truecaller. This way, we eliminate the firm-specific factors in order to increase the credibility and applicability of our results.



Figure 10: Our suggested framework for identifying the factors that influence cross-functional collaboration achieved in startups.

9 Discussion

Through analysing the empirical findings we can conclude that the majority of the factors that we have identified during the CIT sessions, as well as through the more general interviews, can be classified according to our theoretical framework. This implies that several of the factors touched upon by the interviewees in relation to their positive cross-functional team incidents are anchored in theory, indicating that the frameworks by Gupta et al., Wheelan and Wheelwright and Clark consist of valid factors with regards to what contributes to the level of cross-functional integration achieved within an organizational setting.

Another interesting insight gained through analysing the empirical findings of our case companies is the fact that being a startup firm with relatively few employees automatically

implies that the structural factors - *degree of complexity*, *degree of formalization* as well as *degree of centralization* - are low. This, in turn, builds upon the assumption that Henry Mintzberg is correct when concluding that smaller organizations inevitably employ a structure with a relatively low degree of complexity, formalization and centralization. As mentioned in the analysis, Mintzberg claims that the coordination mechanism of an organization is forced to become increasingly complex, formalized and centralized first when more people are employed. His reasoning goes as follows: the more members in the organization, the less feasible it gets to coordinate through, for instance, direct supervision and, therefore, complexity is added (Mintzberg, 1993). According to Gupta et al., a low degree of complexity, formalization and centralization contribute to a higher level of marketing-engineering integration achieved compared to the level prevailing in organizations, where complexity, formalization and degree of centralization is relatively higher. We have, through our interviews, identified factors that support this claim. However, the interviewees have not talked explicitly about the advantages of, for instance, working for an organization with little complexity, but rather mentioned other favourable factors that presumably result from a low degree of complexity. Put together, these observations argue for the concluding remark that organizations employing a relatively small number of people, 20 and 6 employees for Truecaller and Saltonsoft, are better equipped from the perspective of achieving a successful cross-functional collaboration compared to organizations with a higher number of employees. This could, in turn, be interpreted as one of the reasons for the application of lean in the startup context, since being a small startup firm per se enables better integration possibilities between marketers and engineers; which is important, as cross-functional collaboration is required by the lean concept.

From the analysis we have also realized that several of the factors that were mentioned by the interviewees in relation to their positive incidents and that Wheelwright and Clark portray as essential for successful cross-functional teamwork, have touch points with central building blocks of the lean startup concept. In light of this observation we argue that, although the lean startup approach requires cross-functional integration between marketers and engineers, some of its most central parts also facilitate such cross-functional collaboration. To be more specific, the lean startup approach is focused around the “Build-Measure-Learn Feedback Loop”, which involves the sharing of customer feedback across functions, the building of the MVP and the early involvement of marketers and engineers in the product development process (Ries, 2011). These three building blocks correspond well

with the first three factors presented in the framework by Wheelwright and Clark (“shared understanding of customers”, “sharing prototypes with the customers”, “early involvement of both engineers and marketers”).

Put together with the aforementioned claim that small startup firms achieve more cross-functional integration compared to larger companies, *ceteris paribus*, we can conclude that the lean startup approach provides good conditions with regards to achieving its required cross-functional collaboration between marketers and engineers.

10 Conclusions

In the following section, the main conclusions of this thesis will be presented. More specifically, we begin by summarizing our main findings, which constitute the general conclusions of our research, and then move on to highlighting their practical implications. The section ends with a discussion on the limitations of our findings, which concludes with avenues for further research.

The purpose of this thesis was to identify factors that are influencing the collaboration achieved between marketers and engineers in a lean high-tech startup context. Thus, in the pursuit of fulfilling this purpose we have addressed the following overarching research question:

Which factors influence the cross-functional collaboration achieved by high-tech startups pursuing the lean startup concept?

Our results rely on the empirical evidence gathered in two Swedish high-tech startup firms pursuing the lean startup strategy. The findings of our study, i.e. the identified factors that we argue influence the cross-functional collaboration achieved in the two case companies, have been classified according to a theoretical framework. This framework builds – with some alterations – on a synthesis of three frameworks conducted within the fields of marketing-engineering integration, effective teamwork and successful cross-functional collaboration. In cases where the framework failed to cover an identified factor, the framework was been extended through allowing self-made categories.

At the general level, we conclude that the majority of the factors that we have identified during the CIT sessions, as well as through the more general interviews, can be classified according to our theoretical framework.

In the case of Saltonsoft the factors in the figure below were identified as factors that influenced the cross-functional collaboration achieved between the marketers and engineers. Factors put in brackets constitute the ones that were less prominent compared to the other factors and thus also presumably slightly speculative in nature.

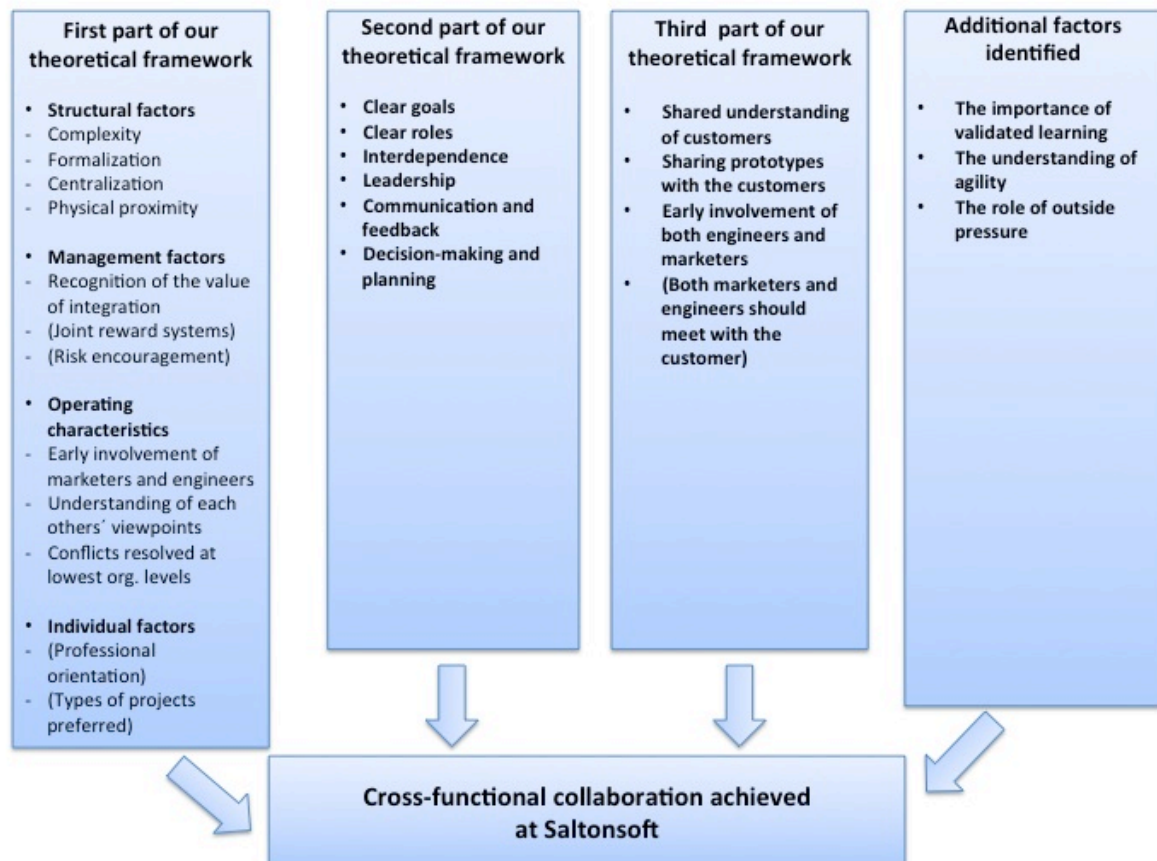


Figure 11: The summary of identified factors at Saltonsoft.

First of all, we can conclude that the structure of Saltonsoft entails a low degree of complexity, formalization and centralization, together with a physical co-location of the marketers and engineers employed. Secondly, we have also identified factors, which were portrayed by the interviewees as important in relation to their positive incidents, that presumably are results of the aforementioned structure. Thus, we can conclude that the simple structure of Saltonsoft in terms of its *low degree of complexity, formalization and centralization together with the physical proximity* between the two professions are found to positively influence the collaboration achieved.

Other factors identified as influential from the perspective of contributing to cross-functional collaboration achieved at Saltonsoft were: the fact that all employees seemed to

recognize the value of integration, the many routines employed for establishing an *understanding of each others' viewpoints*, the *clarity of goals and roles*, together with the prevalence of an *understanding of the superiority of team efforts* over individual efforts. Furthermore, when asked to describe what contributed to the positive incidents, where the cross-functional team worked together and achieved success in product development, the interviewees mentioned factors such as *communication* in terms of high quality and quantity, the fruitful discussions preceding the decision-making and the *scrum and iteration planning meetings*. They also, implicitly or explicitly, pointed to the importance of establishing a *shared understanding of customer preferences*, sharing *prototypes/MVPs* with the market and *involving both marketers and engineers early on* in the product development process.

Factors that were identified at Saltonsoft to have positive influence on the cross-functional collaboration and that could not be classified according to our theoretical framework were *validated learning*, *the understanding of agility*, as well as the *role of outside pressure*. Additionally, factors identified that could be classified according to our theoretical framework, but that, nevertheless, were weak in terms of their prevalence were tendencies of *similarities* with regards to educational background and projects preferred (counted as individual factors in the framework), together with the employment of a *joint reward system* and a grass-root management *system for resolving conflicts*.

In the case of Truecaller, as is displayed in the figure below, the factors identified as contributors to the cross-functional collaboration achieved and that can be classified according to our theoretical framework are more or less identical to the factors presented above in relation to Saltonsoft. For this reason, we will not go through them again, but rather highlight the differences between the two companies with regards to the factors. Again, factors put in brackets constitute the ones that were less prominent compared to the other factors and, thus, also presumably slightly speculative in nature.

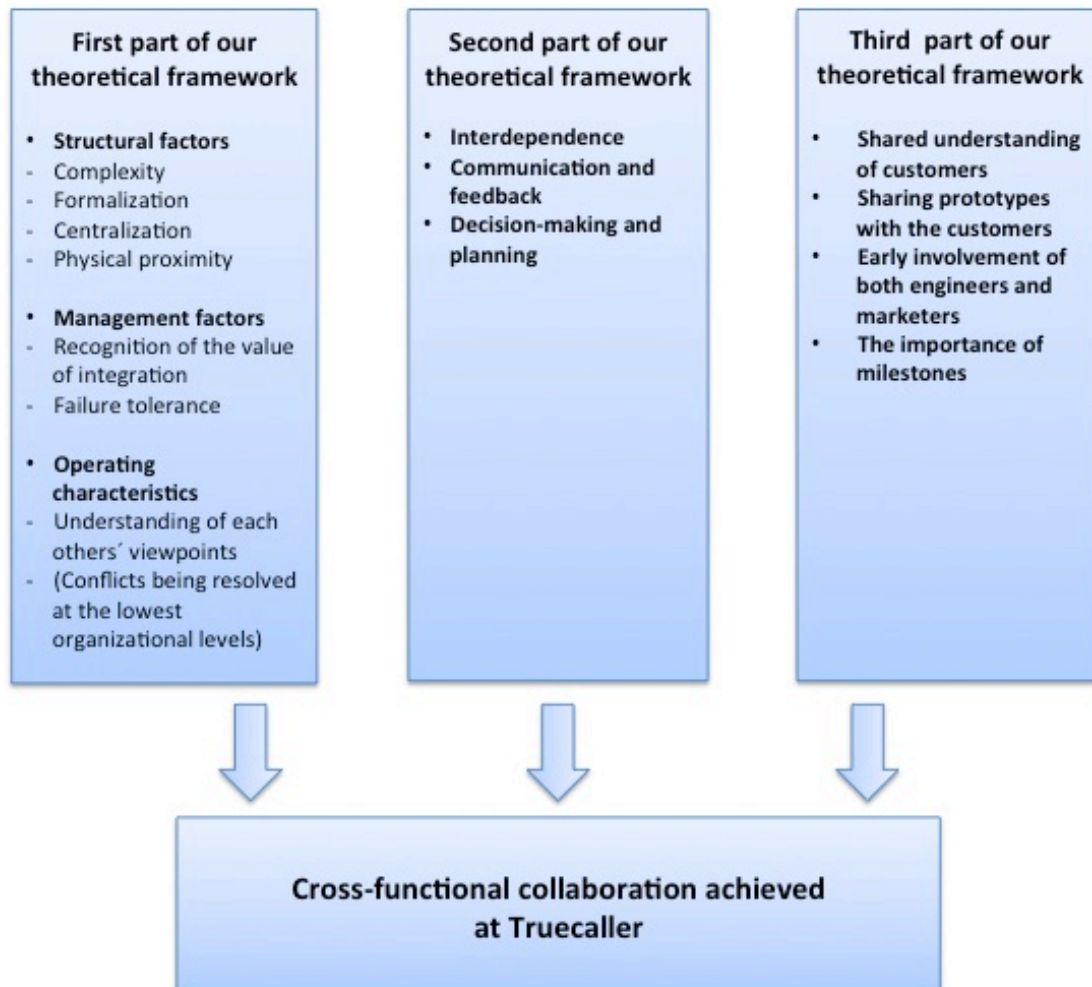


Figure 12: The summary of identified factors at Truecaller.

To begin with, as we interviewed a smaller part of the relevant company population at Truecaller, compared to the part interviewed at Saltonsoft, where all employees participated in the study, we decided to apply an ambitious threshold for determining, which factors to regard as reliably identified. For this reason, as mentioned in the methodology section, we have not taken note of factors that were touched upon by less than 100% of the interviewees. This, in turn, can explain, why the number of identified factors is smaller in the case of Truecaller compared to the corresponding number for Saltonsoft. One factor mentioned by the interviewees at Truecaller, but that we could not identify in the empirical findings of Saltonsoft, was the management related factor referred to as *failure tolerance* in our framework. With that being said, the figure presented for Truecaller also covers the factors identified for Truecaller *and* Saltonsoft together when removing the aforementioned failure tolerance. A factor category that the employees at Truecaller did not in any way touch upon was individual factors with regards to similarities across functions. Additionally, we

could not identify any reliable “additional factors”, i.e. factors that could not be classified according to our theoretical framework and that evoke the need for adding self-made categories. In light of the previous argument regarding the fact that we covered a smaller part of the relevant population at Truecaller and, hence, decided to apply an ambitious threshold for its factors, we do not regard the absence of additional factors at Truecaller as a sign of its collaboration not being influenced by factors outside our theoretical framework. Instead, the interviewees at Truecaller did touch upon aspects that did not fit into the categories in the framework, but none of these aspects were mentioned by 100 % of the people being interviewed and, thus, they were left out of the analysis.

A more general conclusion with regards to the lean startup concept builds upon one assumption and one observation, both presented in the Discussion section. First of all, we argue that organizations employing relatively few employees (6 and 20 for Saltonsoft and Truecaller respectively) are better equipped from the perspective of achieving a successful cross-functional collaboration compared to organizations employing more people. This assumption is, in turn, a result of the automatically low degree of complexity, formalization and centralization prevailing within less populated organizations (Mintzberg, 1983 & Gupta et al., 1986). Secondly, we have observed that several of the factors identified in terms of their positive influence on cross-functional collaboration and that Wheelwright and Clark portray as essential for successful cross-functional teamwork (Wheelwright and Clark, 1992) have touch points with central building blocks of the lean startup concept (Ries, 2011). Put together, the assumption and the observation lead to the general conclusion that the lean startup concept, when applied in a small firm with relatively few employees (which presumably often is the size of startup businesses), provides good conditions with regards to achieving the required cross-functional collaboration. Or put differently, the lean startup approach not only requires cross-functional collaboration between marketers and engineers but also facilitates such integration.

10.1 Theoretical implications

The research we have conducted contributes to the field of research on cross-functional collaboration achieved within organizations. We have done so by identifying the factors influencing the cross-functional collaboration in the context of high-tech startup firms pursuing the lean startup strategy.

A synthesis of frameworks from the authors Gupta et al., Wheelan and Wheelwright and Clark served – with some alterations - as basis for our theoretical framework. In the concluding section of analysis we have presented our findings in the form of an empirically anchored version of this framework, where some factors that we did not identify have been removed. More specifically, our theoretical contribution to the field of cross-functional collaboration is a framework that is adapted to identifying the factors influencing cross-functional collaboration in startups pursuing the lean startup strategy.

10.2 Practical implications

We believe that our findings can be helpful for startups in general, i.e. both those that are lean and those that are not lean (yet), and that are seeking to improve their product development processes with regards to cross-functional efforts. However, it must be mentioned that the factors identified in this thesis are very firm specific, implicating that what works for one firm could not be assumed to be equally efficient in context of other firms. Thus, the success rates with regards to executing on the factors could deviate significantly.

Following from the argument about the limited generalizability of our findings stated above, we suggest that managers of startup firms pay the most attention to the factors that were identified both in the case of Saltonsoft and in the case of Truecaller and that are displayed in the figure below.



Figure 13: Our suggested framework for identifying the factors that influence cross-functional collaboration achieved in startups.

The managerial implication of the factors presented in the figure is that it is important to be explicit about the value of integration and functional interdependencies. Furthermore, efforts should be directed towards making the employees understand each others' viewpoints and allowing them to take part in decision-making and organizational planning. Another important factor that contributes to cross-functional collaboration is communication. Finally, returning to the general conclusion made previously, where we conclude that the lean startup approach not only requires cross-functional collaboration, but also facilitates such integration, we argue that managers at startup firms that are not yet lean and that seek to improve their cross-functional integration are advised to look into the possibilities of embracing the lean startup concept. This is especially recommended if the firm in question is employing a small number of people.

10.3 Limitations and avenues for further research

The main limitation of this study stems from the limited sample and, thus, also its limited generalizability. A second limitation arises from the fact that, although our research question addresses the identification of factors that influence the cross-functional collaboration, we have neither studied the factors in terms of how much or how little they contribute, nor compared them to each other. Instead, we have confined ourselves to noting, whether a factor can be claimed to influence the cross-functional collaboration or not influence it. Thus, a promising avenue for further research is to extend our study by examining a larger sample of lean high-tech startups or to add to it through illuminating, which factors contribute the most to the cross-functional collaboration achieved.

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Online source:

Business dictionary

<http://www.businessdictionary.com/definition/collaboration.html#ixzz2SF6l7qVn>

12 Appendices

12.1 Questions protocol

12.1.1 General interviews

Neutral questions/“Warming up questions”

- Tell us about your professional and educational background.
- What is your role within this startup company?

Structure and business model

- Which are the main tasks performed at your company?
- How are those tasks divided among the employees?
- Which task/tasks do you believe is/are the most important in order to make the startup company successful?
- Who is in charge of what? Do you have clear roles or is everyone involved “everywhere”?

Strategy

- Who is in charge of developing the strategy?
- What does the process for developing the strategy look like?
- How is the strategy implemented?

Product development

- What does the product development process look like from emergence of an idea to the first product version?
- Who is involved when?
- Who is responsible for what?

12.1.2 Interviews about lean processes

- Is lean an explicit strategic term within the company or rather an implicit strategy?
- What makes your company a lean startup?
- Why did you choose to apply the lean startup concept?
- In what ways does lean contribute to the success of your company?/Why do you think lean has become so popular among startups?

- Which are the biggest sources of waste that you are trying to avoid through implementing lean?
- How do you make sure that improvements made to the product in the name of lean are objectively reflecting what the customer wants?
- How is the lean concept evaluated?
- How do you define quality within your company?
- What are the main difficulties with implementing lean?

12.1.3 CIT

1. Please tell us about a situation when you worked together (marketing and product development teams) and achieved success in product development.

- What factors caused this situation to happen? Which ones were particularly helpful?
- What role did the cross-functional team effort play in this incident?
- What did this situation result in?

2. Please tell us about a situation when you all worked together, but were not very successful in product development.

- What factors caused this situation to happen? Which ones were particularly unhelpful?
- What role did the team cross-functional effort play in this incident?
- What did this situation result in?

12.2 List of interviews

	Company	Position of the interviewee	Functional classification	Subject of the interview	Date of the interview
1.	Saltonsoft	CPO	Marketing	General	2012-12-20
2.	Saltonsoft	CEO+CPO+CTO	Marketing	General	2013-01-15
3.	Saltonsoft	CEO	Marketing	Lean	2013-04-05
4.	Saltonsoft	CPO	Marketing	Lean	2013-04-05
5.	Saltonsoft	CTO	Engineering	Lean	2013-04-05
6.	Saltonsoft	CEO	Marketing	CIT	2013-04-05
7.	Saltonsoft	CPO	Marketing	CIT	2013-04-05
8.	Saltonsoft	CTO	Engineering	CIT	2013-04-05
9.	Saltonsoft	Software developer	Engineering	CIT	2013-04-05
10.	Saltonsoft	Software developer	Engineering	CIT	2013-04-05
11.	Saltonsoft	Software developer	Engineering	CIT	2013-04-05
12.	Truecaller	Marketing manager	Marketing	General+lean	2013-04-24
13.	Truecaller	Release manager	Engineering	General+lean	2013-04-24
14.	Truecaller	Marketing manager	Marketing	CIT	2013-04-24
15.	Truecaller	Release manager	Engineering	CIT	2013-04-24
16.	Truecaller	Software developer	Engineering	CIT	2013-04-24

12.3 Grouping of identified factors

	Oscar	Axel	Arvid	Felix	Joel	Emil
<i>Clear roles</i>	All employees at Saltonsoft can describe their own role and the role of everyone else, when faced with the question: "Tell us about your role and main tasks within the company".	All employees at Saltonsoft can describe their own role and the role of everyone else, when faced with the question: "Tell us about your role and main tasks within the company".	All employees at Saltonsoft can describe their own role and the role of everyone else, when faced with the question: "Tell us about your role and main tasks within the company".	All employees at Saltonsoft can describe their own role and the role of everyone else, when faced with the question: "Tell us about your role and main tasks within the company".	All employees at Saltonsoft can describe their own role and the role of everyone else, when faced with the question: "Tell us about your role and main tasks within the company".	All employees at Saltonsoft can describe their own role and the role of everyone else, when faced with the question: "Tell us about your role and main tasks within the company".
<i>Validated learning</i>	Oscar finds it difficult to pinpoint single "failures", because a lot of the events and actions that are not so successful per se result in valuable insights that lead to success later on. In his positive incident he also claims that validated learning led to improvements of the processes of the company.	From both the negative and the positive case the company learned a lot. Learning is a red thread through out the whole interview.	Arvid is reluctant to call cross-functional team incidents less successful, as the team always learns from the negative experiences.	In Felix's story the negative case is chronologically occurring before the positive incident happens and from his story it becomes rather obvious that the team learned from unsuccessful teamwork and implemented the lessons learned in the form of improvements (more meetings to achieve better synchronization, as well as the removal of the "go-to-guy"), which played a central role in the successful incident. The team has also learned from mistakes how to "cheat" properly, which entails not cheating in the process but on the features.	Joel claims that Saltonsoft is a completely different company today compared to what it looked like at the time of the unsuccessful product development incident. Communication has been improved and better structure is installed.	From Emil's story we get that Saltonsoft fixed things that needed to be fixed, which is part of the agile way of working. Today the team has improved its performance, which Emil believes is partly the result of a changed location structure. Previously, the developers were located in a separate (and dark) room, whereas currently they are co-located which enables more straightforward communication.
<i>Presenting prototypes</i>	The key to Oscar's positive incident was the fact that Saltonsoft decided to build a preliminary product version, more focused on the user side than on technical aspects. Therefore, the founders told their newly hired engineers that they had to build a simulation of what Saltonsoft was supposed to offer, which turned out to be a success based on the cross-functional efforts. Oscar concludes that this was a true lean project, as they decided not to build a full product version, but rather to build a MVP that served as a feedback collector.	The most recent victory was the last product release, where Saltonsoft managed to get together a very early MVP that was beyond expectations despite the fact that they had an ambitious plan.	The key to the successful product launch was realizing that the company could take a shortcut through building a MVP. According to Arvid, the MVP reduces the scope of the work, so that what is delivered is not perfect, but good enough.	Felix begins his positive incident story through updating us on the fact that Saltonsoft has a closed product beta version, which is currently subject to limited user testing, but will be officially released within short. This has in turn been an important milestone for the success experienced within the team.	-	Emil thinks that the biggest achievement so far, with regards to cross-functional efforts, happened last fall when the team was under a lot of pressure to produce a version close to the final product in the pursuit of attracting investors. Therefore, the team programmed for 48 hours, which resulted in a functioning demo in the form of an MVP. According to Emil this felt "nice".
<i>Recognition of the value of integration</i>	In the successful case, Oscar states that without the team the building of the product would not have been feasible and if they wouldn't have built that product, they would not have survived.	-	Finally, Arvid states that the developers need to synchronize their work at all times. Therefore, it becomes critical for Marketing Oscar and Marketing Axel to adapt to the process, as unless the synchronization is achieved across functions its efficiency will not be realized.	Saltonsoft has learned to avoid "go-to-guy" in the sense that the team of developers are aiming at enabling everyone to do more or less everything related to development. Therefore, his role entails that he should be able to work on any part of the system and at the same time make sure that everyone else can do the same, which, in his belief has contributed to successful development within the firm.	Joel points out that it is essential for the team to be on the same page and to do things in the right order. This implies that the developers and the marketers need to be synchronized in order to be successful within product development.	In his successful incident, Emil mentions that there was a very clear distribution of tasks, and the team members focused on different work areas, where all parts were essential for the successful development.

<i>Communication and feedback</i>	-	Axel highlights, when talking about the successful incident, good communication as one of the main success factors involved, both among the developers, as well as between the developers and marketers. The role of communicating was especially helpful in this case from the perspective of facilitating the prioritization among work tasks on part of the developers. At the same time he believes that his negative incident could have been avoided through sufficient communication both in terms of quality and quantity.	Arvid says, when talking about the unsuccessful case, that communication between developers was another factor causing the bad incident, as the developers "walled themselves in", concentrated on their narrow tasks without discussing where the product was moving as a whole. Arvid also outlines communication as a general success factor.	Felix claims that unsuccessful teamwork usually results from improper iteration planning, which tends to be caused by the incidence of the team not being fully staffed when the planning is conducted. As a result, the valuable input from the absent team members is forgotten to take into account. This can be interpreted as communication between the different team members being very important for the end result.	At the more general level, Joel believes that the factors leading up to this event were bad planning and insufficient communication between developers and marketers. The marketing team was simply not aware of how far the developing team had come and, as a consequence, made unrealistic promises to investors and users	Emil claims that when developing software there are a lot of aspects that are implicit and that you sometimes forget to communicate. For Saltonsoft this resulted in the fact that the marketing team overpromised certain things to the try-out users, while the developers were not aware of what the marketing team was telling the stakeholders.
<i>Interdependence</i>	In the successful case, Oscar states that without the team the building of the MVP would not have been feasible and the MVP is in turn the reason the company survived.	-	To make the team members understand their interdependencies "team programming" has been introduced, implicating that the whole programming team gets together and works on the same code collectively in a pursuit of getting everyone on the same page.	Felix clarifies that synchronization of work tasks between the different employees, is one of the biggest challenges within software development and can be costly if not properly achieved	Joel points out that one success factor with regards to cross-functional product development is that the whole team is on the same page and does things in the right order. This implies that the frontend developer, the backend developers and the marketers need to be synchronized. According to Joel, unless everyone is on the same page, engineers and marketers have to guess what their colleagues are doing and then hope for a fit with regards to what they have been working on themselves.	In his successful incident, one of the success factors was the clear distribution of tasks, where everyone focused on different aspects, yet saw the importance of each others' diverse efforts.
<i>Decision Making and Planning</i>	-	Axel believes that one of the keys to this success was the fact that the company had managed to get "right" behaviors and routines in place (for example the daily scrum meetings as well as the weekly iterations). However, these "right" behaviours and routines do not just happen by themselves, but have to be planned for and the best way to do that is through focusing on aspects that already feel natural to the members of the team.	Arvid says that for Saltonsoft team programming, scrum meetings, iteration planning and flat hierarchy have proved to be effective.	He summarizes his answer through stating that scrum planning and iteration planning have proved to be very important for the cross-functional collaboration, as they keep him updated on the customer feedback, help establishing a shared view on product development within the team and finally, get everyone involved in the process.	Joel concludes that, in the unsuccessful case, there were not enough routines in place to support the communication process, but this has changed, the company has learned a lot and today looks completely different with regards to communication and structure.	-

<i>The role of outside pressure</i>	One contributing factor to the positive incident was the fact that Oscar and Marketing Axel had publically announced the launch of their product, which created external pressure as the product development process turned out to be more time consuming than expected. However, the pressure made the team productive.	Saltonsoft managed to get together a very early MVP, which could be presented to stakeholders and which was beyond expectations despite the fact that they had an ambitious plan.	Arvid told us about a positive incident that happened at the product release stage, where there was a lot of pressure coming from investors and customers, who wanted to see what Saltonsoft could offer.	-	-	Emil thinks that the biggest achievement so far, with regards to cross-functional efforts, happened last fall when the team was under a lot of pressure to produce a version close to the final product in the pursuit of attracting investors. Therefore, the team programmed for 48 hours, which resulted in a functioning demo in the form of an MVP. According to Emil this felt "nice".
<i>Clear goals</i>	In the successful case, Oscar mention that Saltonsoft started off with setting a meaningful and clear goal, and the challenge was that the goal was really high. Because of the co-dependency of features in product development, it was crucial to break the key features determining the development process into smaller pieces, so that the whole development process could be completed quicker.	In the unsuccessful case, Axel saw tendencies of developers working on things that they would not have been working on if they had known what was and where the company was heading.	In the unsuccessful case, what comes to Arvid's mind is when he did not realize, how difficult it was for everybody to be aligned and have the same vision and goals. There were no good processes in place. Arvid has never worked in a team before, and was only used to developing alone. In his positive case however clear and meaningful goals made people aware of the objectives with regards the outside pressure.	-	-	-
<i>Leadership</i>	Oscar mentions, when talking about the unsuccessful case, that the person who "ran the show" applied a very self-confident leadership approach. To be more specific, the "leader" knew what he was doing and did not have to plan his own work. However, for the rest of the team, who had less experience, the lack of a plan made the development process extremely difficult.	One of the main factors contributing to this negative experience was, according to Axel, insufficient leadership. More specifically, the head developer, who is supposed to provide guidance for the rest of the developers, knew how to spend his time wisely without overdoing things, whereas the other developers, on the contrary, did not have as much experience. Instead they got the impression that as that the low-level solutions were very important and ended up focusing the wrong things.	Arvid mentions, when talking about the unsuccessful case that the bad situation was resolved when Arvid started to embody the role of the project leader and thereby, get more involved into what everybody was doing. As a result the developers became much more productive	-	-	-

<i>Shared understanding of customers on part of the engineers</i>	-	Axel mentions that the strategy is to involve the product developers in customer meetings, so that they get to see the way the customer interacts with the product for themselves. Axel believes that it is essential for developers to feel customer's "pain" so that they get emotionally involved.	-	Felix clarifies that the scrum and iteration meetings are especially important, since the customer feedback collected by the marketers enters the product development that way and influences the process in the sense that the team is trying to build everything from the user experience perspective. Thus, the requirements "boil down" from the customer complaints and direct what needs to be built on the basis of what is currently missing.	Joel explains how Oscar visits the customers and comes back with a list of things that the users are annoyed about and that they like. This information is passed on to the developing team through meetings and workshops. Joel and the rest of the developers then try to fix the negative things	-
<i>The understanding of agile development</i>	At the same time, Marketing Oscar believes that it is quite easy for the developer to grasp the essence of the lean approach anyway, since a similar concept called "agile development" is a central part of their engineering education.	-	-	Felix claims that the recent progress comes from the company's agile way of working, which enables quite "frictionless" work in the sense that no one is wasting time waiting for another person to finish his task. That is, agile processes help the company to synchronize work, which is one of the biggest challenges within software development and can be costly if not properly achieved.	-	Emil concludes the incident was resolved as the team "fixed the things that needed to be fixed", which is a central part of the agile way of working.
<i>Degree of formalization</i>	-	Axel believes that one of the keys to this success was the fact that the company had managed to get "right" behaviors and routines in place (for example the daily scrum meetings as well as the weekly iterations). However, these "right" behaviours and routines do not just happen by themselves, but have to be planned for and the best way to do that is through focusing on aspects that already feel natural to the members of the team.	Arvid talks about flat hierarchy being effective for Saltonsoft.	He also mentions that Saltonsoft has learned to avoid "go-to-guy" in the sense that the team of developers are aiming at enabling everyone to do more or less everything related to development. Therefore, his role entails that he should be able to work on any part of the system and at the same time make sure that everyone else can do the same, which, in his belief has contributed to successful development within the firm.	-	-
<i>Degree of centralization</i>	Not explicitly addressed during CIT	Marketing Axel claims that what makes Saltonsoft lean is the absence of a "yes-culture", implicating that the culture at Saltonsoft is more of the reflective kind, where everybody can question any action.	Arvid talks about flat hierarchy being effective for Saltonsoft.	Felix claims that unsuccessful teamwork usually results from improper iteration planning, which tends to be caused by the incidence of the team not being fully staffed when the planning is conducted.	Not explicitly addressed during CIT	Not explicitly addressed during CIT
<i>Degree of complexity</i>			In the interview about development processes Arvid talks about how team programming gets every single employee on the same page. This would not have been feasible in a large organization.		Joel points out that one success factor with regards to cross-functional product development is that the whole team is on the same page and does things in the right order. This implies that the frontend developer, the backend developers and the marketers need to be synchronized.	One of the success factors within this incident was the clear distribution of tasks, where everyone focused on different aspects, yet saw the importance of each others' diverse efforts

<i>Both marketers and engineers meet with the customer</i>	Not explicitly addressed during CIT	Axel mentions that the strategy is to involve the product developers in customer meetings, so that they get to see the way the customer interacts with the product for themselves. Axel believes that it is essential for developers to feel customer's "pain" so that they get emotionally involved	Not explicitly addressed during CIT	Not explicitly touched upon	Since Joel is not the typical user, he believes that observing users through joining customer meetings could be a way for him to gain a deeper understanding about their preferences.	Not explicitly touched upon
<i>Early involvement of both engineers and marketers</i>	The feedback collected by Axel and Oscar goes into the product development process through a weekly meeting attended by the three founders. After the meeting Oscar meets with the product team to break down the priorities and changes to the weekly level, so that everyone knows what is to be done the coming weeks.	The feedback collected by Axel and Oscar goes into the product development process through a weekly meeting attended by the three founders. After the meeting Oscar meets with the product team to break down the priorities and changes to the weekly level, so that everyone knows what is to be done the coming weeks.	Not explicitly addressed during CIT	He summarizes his answer through stating that scrum planning and iteration planning have proved to be very important for the cross-functional collaboration, as they keep him updated on the customer feedback, help establishing a shared view on product development within the team and finally, get everyone involved in the process	Most of the positive events start off with Marketing Oscar visiting the customers in order to get together a list of things that the customers want to improve. This information is passed on to the developing team through meetings and workshops and it is up to Joel and the rest of the developers to correct the negatives.	Not explicitly touched upon
<i>Proximity</i>	-	-	In the interview about development processes Arvid talks about how team programming gets every single employee on the same page. This would not have been feasible if people were not co-located.	-	This implies that the frontend developer, the backend developers and the marketers need to be synchronized. According to Joel, unless everyone is on the same page, engineers and marketers have to guess what their colleagues are doing and then hope for a fit with regards to what they have been working on themselves.	Emil notes that co-location with marketing enables more straightforward communication in comparison to when the developers were in a separate dark room.
<i>Risk encouragement</i>	Not explicitly touched upon	Axel says that one thing contributing to his successful incident was that the product developers taking initiative and thinking outside the box.	Not explicitly touched upon	Not explicitly addressed during CIT	Not explicitly addressed during CIT	Not explicitly addressed during CIT
<i>Joint reward systems</i>	Not explicitly addressed during CIT	Although Axel believes that a startup should never consider itself successful, but rather strive further, he do believe that small victories along the way must be celebrated within the team, in order for its members to remain motivated.	Not explicitly addressed during CIT			

	Jesper	Marcus	Mats
<i>Communication and feedback</i>	Everybody in the company is so used that a lot of things are happening all the time that they sometimes forget to communicate some decisions to each other.	1. The ongoing development process would be very hard to be made useful and understood, if the marketing team did not do their job well and communicate the changes to the customers in the right way. 2. It was not an accidental discovery leading to success, rather a lot of hard work done by everyone. Being cross-functional and being able to constantly <i>communicate</i> with each other and have everyone on the same page made it work. 3. Marcus notes that although Truecaller is a very small team, there are still some difficulties in <i>communication</i> .	He just notes that sometimes it happens that the specifications for the features are not fully delivered to the development team, which makes the implementation somewhat harder. However, Mats notes that any issues that occur in connection to these incidents are resolved within the team quite fast due to the efficient communication at Truecaller and physical proximity of everyone in the team.
<i>Degree of formalization</i>	Jesper explains that in order to avoid these kinds of mistakes there are certain instruments in place: regular brainstorming sessions, a tool, where the progress of the changes is reflected, <i>cross</i> -platform meetings every Monday.	The communication is done in several ways. There are cross-platform meetings held every week or even several times a week, where developers, support, marketing and founders get together and exchange the information.	1. The team had been briefed and received the documentation from the Release manager and got working on the front end. 2. Mats notes that sometimes it happens that the specifications for the features are not fully delivered to the development team.
<i>Degree of centralization</i>	The process of developing new features is such that everybody in the company gets together for a brainstorming session to discuss what is important for user experience.	At Truecaller it is believed that everything should be discussed together, so that different perspectives are always considered.	Mats notes that the team managed to make a very successful release of this feature all together.
<i>Degree of complexity</i>	Jesper talks about one of the brainstorming sessions mentioned in the previous section, where everybody was involved, from the support to the office manager.	Marcus believes that an incident of successful collaboration happened when Truecaller developed a new version of the app, introducing a function called "name search". It was the time for everyone in the company to work together.	Mats notes that the team managed to make a very successful release of this feature all together.
<i>Proximity</i>	Jesper also notes that the team is quite small, there is no bureaucracy and decisions are made very quickly.	He notes that everybody at Truecaller is located in one open space area, which makes the communication very easy.	However, Mats notes that any issues that occur in connection to these incidents are resolved within the team quite fast due to the efficient communication at Truecaller and physical proximity of everyone in the team.
<i>Recognition of the value of integration</i>	Jesper concludes that the deciding factor for success of the brainstorming sessions is that everybody was involved.	The ongoing development process would be very hard to be made useful and understood, if the marketing team did not do their job well and communicate the changes to the customers in the right way.	Mats notes that the team managed to make a very successful release of this feature all together and that everybody in the team was happy to see users' reaction to what they had created.
<i>Presenting prototypes</i>	Jesper talks about the importance releasing beta-versions in order to check market's reactions to the changes in the product.	After a feature is developed, a beta-version is released and tested on the market. If there is feedback from the market, it is integrated into the final product version	In Mats' opinion, the main reason for this success was that the development team was able to demonstrate the application and gather feedback at an early stage.
<i>The importance of milestones</i>	The result of the implementation of the push-notifications was the increase in monthly "likes" on Facebook by 120%.	The feedback from the users was immediate and very positive, and the usage has grown thanks to this communication part.	Mats notes that the team managed to make a very successful release of this feature all together and that everybody in the team was happy to see users' reaction to what they had created.
<i>The professionals try to understand each other's point of view.</i>	Jesper believes that it is very important to compliment marketing with technical expertise. Moreover, even the office manager compliments the discussions with common sense and user experience side.	It was not an accidental discovery leading to success, rather a lot of hard work done by everyone. Being cross-functional and being able to constantly <i>communicate</i> with each other and have everyone on the same page made it work.	Once completed, the development team demonstrated the new feature to the Release manager and to the support and marketing team, who could then ask questions and make remarks.
<i>Early involvement of both engineers and marketers</i>	Jesper concludes that the deciding factor for success of the brainstorming sessions is that everybody was involved. He believes that it is very important to compliment marketing with technical expertise.	The ongoing development process would be very hard to be made useful and understood, if the marketing team did not do their job well and communicate the changes to the customers in the right way.	The team had been briefed and received the documentation from the Release manager and got working on the front end. Once completed, the development team demonstrated the new feature to the Release manager and to the support and marketing team, who could then ask questions and make remarks.

<i>Failure tolerance</i>	If such mistakes happen, in the end it is a missed chance to communicate to the user believes Jesper. Such mistakes are not critical, but rather a missed opportunity to communicate to the user that progress is happening.	However, because of such incidents application was not perceived worse in any ways. And the team was very responsive when it happened to make the customers satisfied and to compensate for it in a way.	Mats notes that any issues that occur in connection to these incidents are resolved within the team quite fast due to the efficient communication at Truecaller and physical proximity of everyone in the team.
<i>Interdependence</i>	Jesper concludes that the deciding factor for success of the brainstorming sessions is that everybody was involved. He believes that it is very important to compliment marketing with technical expertise	The ongoing development process would be very hard to be made useful and understood, if the marketing team did not do their job well and communicate the changes to the customers in the right way.	In order to create this feature, the development team had to know, what had to be possible to edit in a profile and how a profile should be appear to a user. The team had been briefed and received the documentation from marketing through Release manager.
<i>Decision Making and Planning</i>	Jesper clarifies that the process of developing new features is such that everybody in the company gets together for a brainstorming session to discuss what is important for user experience.	At Truecaller it is believed that everything should be discussed together, so that different perspectives are always considered.	In order to create this feature, the development team had to know, what had to be possible to edit in a profile and how a profile should be appear to a user. The team had been briefed and received the documentation from the Release manager and got working on the front end.
<i>Shared understanding of customers on part of the engineers</i>	There are cross-platform meetings held every week or even several times a week, where developers, support, marketing and founders get together and exchange the information. This helps a lot to have good communication to the customers, because everyone then has the same information.	After the brainstorming session, it is Marcus' task to document it and put it into "feasibility stage", where the developers and he together look at the ways of how to implement the changes.	In order to create this feature, the development team had to know, what had to be possible to edit in a profile and how a profile should be appear to a user.