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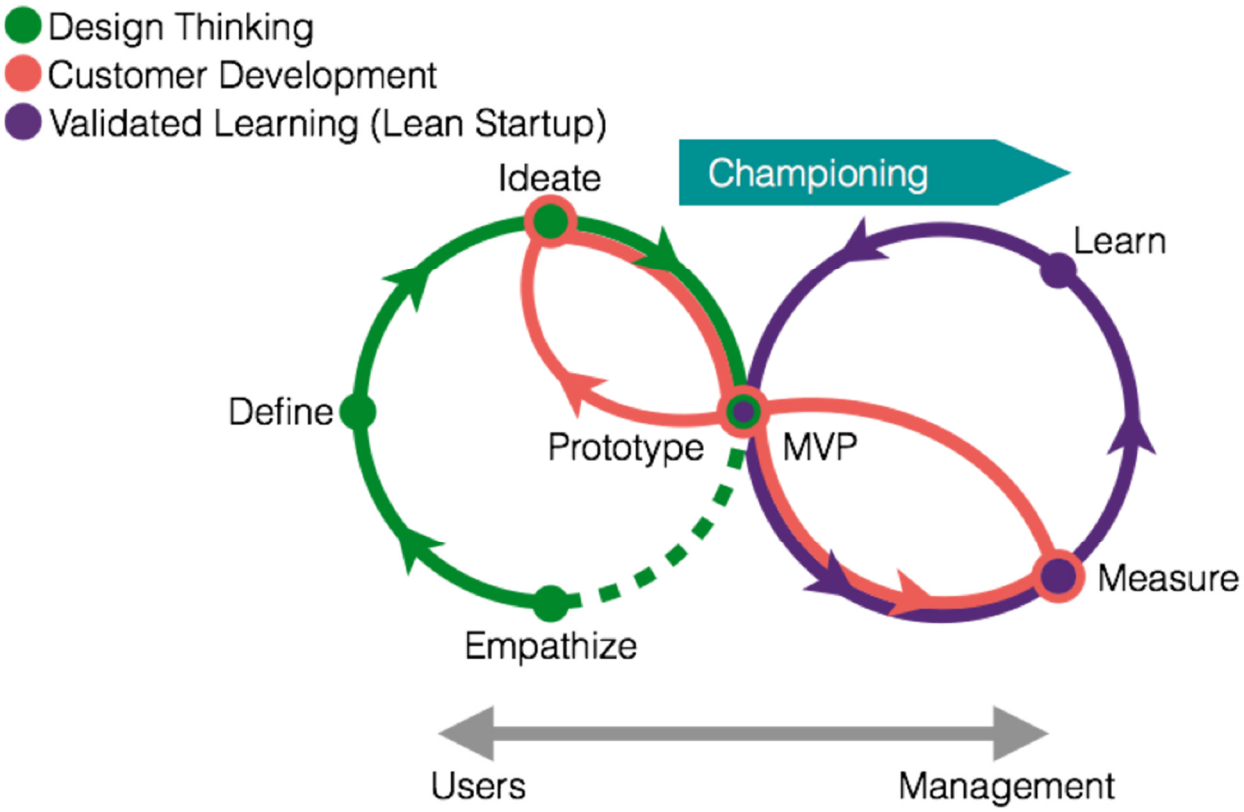

Values from using a user-centered methodology in a large organization

A project at Volvo Trucks

Master of Science Thesis
in the Management and Economics of Innovation Programme

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Cover:
Illustration of the created, by the researchers, CUT methodology process.

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Abstract

Firms of today develop innovative products and services to stay competitive on the fast paced marketplace. Although, large and heavy organization tend to make internal processes slow and resource demanding. To stay competitive, firms need to pick up on initiatives for process improvement and effectively implement those. Conventional methods for implementation of change within organizations have been proven to often fail due to unsustainable solutions.

Several upcoming methodologies address issues of unsustainable solutions by focusing on capturing user knowledge to gain insights of the problems, while iterating solutions accordingly. In this thesis, a combination of the most acknowledged user-centric methodologies have been concluded in an attempt to effectively drive process improvement in a corporate setting and in order to overcome conventional problems of change in large organizations. A methodology, called CUT, was created and used by the researchers for this purpose. Through an action research, the CUT methodology was used to run an initiative for a process improvement at Volvo Trucks towards realization.

The research presents several advantages with applying the CUT methodology, although three core advantages stood out the most. Firstly, the researchers experienced that users became highly engaged in the project, and tended show great support for the initiative. This effect tends to be difficult to obtain through more conventional methods. Secondly, acceptance amongst top management was relatively easy to gain, as iteration of user insight was aligned with the firm's vision and strategy. Further, with great support from users the importance of the initiative became more obvious. Thirdly, a much appreciated solution was created in a relative short amount of time, that is considered to be a result of the CUT methodology.

Acknowledgments

The spring of 2015 was for both of us defined by the project and research we conducted at Volvo Trucks. A lot of hard yet interesting work with many great people provided us enormous learnings, which we can thank our supervisor Goran Bojovic for. His efforts and engagement was priceless, as he always took time for us and stood by our work. We would also like to thank Hans Wikström as he, together with Goran Bojovic, gave us the great opportunity and trust to take part of his project. Both gave us great freedom to work by our own methods while providing support at all times. Further, we would like to show a lot of appreciation to the driving force and daily support of the project, Ronny Hagman. Our brief stay at the organization has given us unique experience, which we are truly grateful for.

Lastly, but definitely not the least, our amazing supervisor and tutor Sofia Börjesson. Thank you for guiding us throughout the entire Master's thesis and enabled us to see clarity in our work.
It was a joy to work with such a truly devoted and understanding professor.

Thank you all,
Roger and Marko

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1. Introduction

This chapter frames the essence of the master thesis, and also what and why it was done.

1.1 Background

In today's rapidly changing and evolving environment, and with a rapid technical development, there is huge necessity for the organization to be agile. New market demands from governmental regulation, competitors or customers are constantly on the rise. Adaption of business processes, services or products need to meet these demands to maintain the competitive edge. (Carpinetti, Gerólamo and Dorta, 2000)

Many of the more modern management concepts such as Lean Product Development, Six Sigma, and Lean Production has a large emphasis on continuous improvements and are a vital part of the modern organization. The philosophy of all these theories is to consider that no process is at its maximum beneficial state, but merely in the presently optimal state waiting to be developed and further improved.

Large organizations, however, entail complex structures and face bureaucratic challenges for improvements of processes (King et al. 2014). In these large organizations such as truck manufacturers, change initiatives are generally initiated from top-down by the senior management of the organization (Gobetto, 2013). However, many organizational changes and improvements fail. Top management can e.g. simply not have all the insights and organizational knowledge that the actual users of the processes possess in order to apply improvements effectively (Brown, 2009).

As large organizations most often rely on a top-down strategy they face difficulties of initiating improvements from bottom-up; they often lack formal methodologies, a supporting culture, and resources to implement such improvements (Attong and Metz, 2013). The need and value of such improvements have in recent years become a vital part of organizational management in order to keep up with the continuous evolving competition. Addressing these issues, there has emerged some disciplines focusing on user knowledge and customer insight, regarding both product and organizational development (Brown, 2009).

Design Thinking theory grounds itself in customer insight from user knowledge, and has in recent time become widely acknowledged as a tool for businesses to become dynamic and create long-term competitive advantage (Martin, 2009).
Another theory building upon both Design Thinking and lean production is Lean Startup methodology. While the mentioned methodologies are somewhat similar regarding focus and mindset, Design Thinking stands as the broad and overall process while the other methodologies complements and cover more specific areas and issues.

This thesis aims to show that successful change initiatives can be initiated and implemented in a large organization by utilizing user knowledge and involvement. Users in this definition being i.e. the first-hand users of systems and activities concerning the studied process.

By receiving a unique opportunity in terms of an assignment to run a project within a large organization as Volvo Trucks, the researchers created and used the Corporate User Thinking (CUT) methodology, which is a combination of user-centered methodologies for the task. The purpose with the assignment was to develop a process improvement solution, and to further anchor, gain acceptance and to finally initiate the realization process of the initiative. The CUT methodology is explained and described in chapter 2.

The project assignment at Volvo Trucks that the researchers worked with will hereafter be mentioned as the Thesis Project. The project aimed at improving a product introduction process that in recent years had become problematic and resource demanding. The researchers were given the responsibility to individually analyze the problems, the environment, and help the project team to drive the user initiated project forward while developing solutions and acceptance among important stakeholders. This thesis aims to describe and analyze how the CUT methodology (i.e. combination of user-centered methodologies) has affected the Thesis Project.

1.2 Purpose

Business processes, defined as a collection of activities that produce a valuable output for the customers, in large bureaucratic organizations involve a large amount of stakeholders, often across several departments within the firm (Davenport, 1993). To cope with this, processes become standardized and often fragmented - leading to coordination difficulties and lacking efficient lateral communication (Gavin, 1998). These become deeply rooted within the organization even though they are obviously inefficient. Consequently, these processes lack flexibility for short term deviations but also for more lasting changes for e.g. dealing with industry competition. In some cases, inefficient and troublesome processes do not only hurt the internal organization, but its product and service offering - affecting customer satisfaction (Gavin, 1998).

The complexity, processes extensiveness, and involvement of multiple it systems, makes it difficult to for any single person or unit to fully understand or grasp the complete problem. Consequently, the only body with full responsibility for the entire process is the process manager, who likely is not directly involved in the daily operations. Therefore, in large organizations, such as Volvo Trucks, initiatives for process change can be difficult to direct and anchor.

Relevant ideas from first hand users have a long way to travel before they have an opportunity to get realized or even to be considered. The existing processes at Volvo Trucks for implementing process change are resource demanding and imply long lead times. Yet, most process change initiatives fail due to lack of support (Brown, 2009).

This project, therefore, is an attempt to manage a process change initiative from an approach rooted in user-centered methods. With limited to none knowledge about Volvo Trucks' processes, a short period timeframe and sparse resources, the aim was to quickly gain

understanding and grasp the issues. This, in order to start implement change and the work on project deliverables as soon as possible, and ultimately, overcoming risk for failure.

Design Thinking theory is often referred to as a tool for solving "wicked problems"; defined in Buchanan's (1992, p. 97) article as: *"class of social system problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing"*. This definition seems fairly close to the circumstances described above for the researchers at the initiation of the Thesis Project. Further, Blank (2013, p.1) and Ries (2011) describe a startup as; "*A startup is a human institution designed to deliver a new product or service under conditions of extreme uncertainty*" and "*A startup is an organization formed to search for a repeatable and scalable business model*". These definitions are building upon the previous, yet with incorporation of deliverables – resembling the overall setting for the researchers.

This thesis aims to describe an attempt to effectively conduct the Thesis Project through a user-centered approach, by immersing into the complexity of the organization and navigate through the project progress. To capture business value, recognized disciplines for successful startup creation have been taken in consideration and used as a mindset throughout. The combination of the theories have been concluded by the researchers, and is called CUT. Hence, the thesis aims to through an action oriented research approach describe how to initiate and anchor process change initiative within a large organization using the CUT methodology.

1.3 Research questions

In order to guide us through the thesis we have conducted two research questions which helps to grasp the advantages and values created by utilizing the created CUT methodology. To overcome conventional difficulties during change and to add value to a project has been interpreted to be the most important factors of this research.

1. How can the CUT methodology overcome conventional difficulties with change management?

2. What values did the CUT methodology bring to the project?

1.4 Delimitations

The researchers have chosen not to validate the results of the actual Thesis Project with a comparison with a similar project performed within Volvo Trucks using a more conventional methodology. This exclusion is due to multiple reasons; lack of time and resources, confidentiality reasons, and the fact that the researchers wished to focus and elaborate on their actual experiences and the value it brought, rather than comparing it with something they have not been part of.

Politics of personal interests and corporate culture has not been elaborated in this thesis, even though it has been a quite big part during the whole progress of the Thesis Project. Politics can vary heavily depending on the culture of the company, can be very subjective and ambiguous, and is hard to generalize. The generalization of any matter can be flawed based on one specific case, but the researchers estimate that politics is very dependent on individuals and is caused by very different matters and interests that are unique. The researchers interpret that a discussion around the politics during the Thesis Project would become more as a subjective diary and not bring any academic value.

2. Theoretical framework

The described theories in this chapter are stated in this thesis due to the relevance to the Thesis Project. The chapter initially describe some challenges and reasons for organizational and process change, this is described in order to highlight the problematic prerequisites that are faced while attempting to initiate and implement improvements. Further, some work methodologies and principles are described as these are the main theories that has been utilized and followed by the researchers during the Thesis Project.

2.1. Change in large and complex firms

Large firms' strategies most often originate from the top management and is implemented downwards in the lower levels within the organization. This strategy is often called as "top-down" and can also comprise other issues such as improvements. In this strategy, the centralized point of decision making is made from the top management, where the responsibility to acknowledge and perform actions regarding e.g. trends, industry change, needed improvements, and required strategic decisions lies (Mintzberg and Waters, 1985). Another strategy is the so-called "bottom-up", where instead the lower managers and workers use their day-to-day insight and knowledge from actually e.g. performing activities and meeting customers in order to drive and decide strategies and improvements. The top-down initiatives are also most often planned and calculated in order to achieve coordinated and predefined outcomes, while the bottom-up strategy can emerge from unplanned actions that result in valuable outcomes that was not intended from the top management (Burgelman and Grove, 2007).

Both strategies of course come with various pros and cons, and situations where either one is more preferable. For example, big strategy decisions in big firms is most often preferable to be taken from the top management as the magnitude of the amount of lower managers and workers can be so great that it would only become chaotic and hard to bring forward the expertise in order to take beneficial decisions. However, for small, incremental, and often innovative improvements the bottom-up strategy can be preferable as the most insights and expertise of e.g. day-to-day activities lies on the actual users. Top management can impossibly handle and have insight in every process and activity within the organization, and most often only handle issues of bigger magnitude. Also, bigger improvements and innovations for the whole firm or industry can be created from the bottom-up strategy due to better insights and sources of innovation. (Kim, Sting, and Loch, 2014)

That is often why large organization fail to innovate and create incremental improvements. There are often no institutional process or culture to continuously improve processes incrementally. However, not only incremental improvements can be lost by not adopting a bottom-up culture, major improvements, strategies, or innovations may be neglected as the insights and day-to-day knowledge may not reach the top management. Hence, in large firms where the bottom-up strategy is not a part of the culture it can prove to be very hard to achieve change if it is not initiated from the top management, and change originated from the

bottom may never be realized due to the hierarchy structure and challenges. (Kim, Sting, and Loch, 2014).

2.2. Change management

The issue of change management is wide, complex, and regards several different perspectives on the matter of change in an organization. According to Murthy (2007) there are three different so-called "change agents" that are the different components which can be altered when performing change. These so-called change agents are; people, structure, and technology which are the core components in an organization, see figure 1 below.

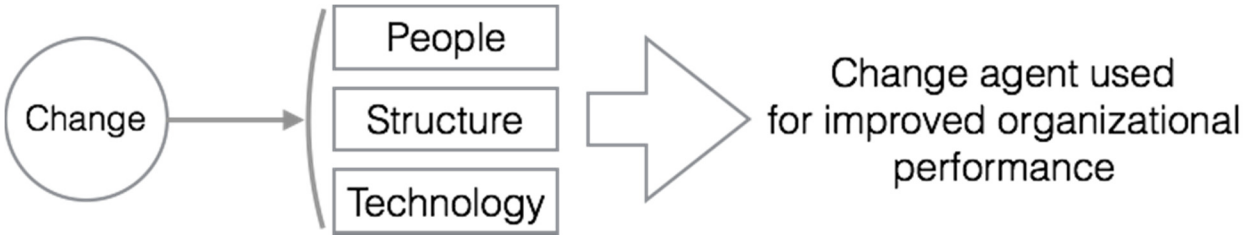

Figure 1: The different so-called change agents in an organization. (Inspired from Murthy, 2007)

Simply, there are two broad forces that drive the need for change according to Murthy (2007). External forces include; the marketplace, government laws and regulations, development in technology, fluctuations in labor markets, and economic changes. The internal forces however the external changes. Different reasons could be; modification of strategies, changes of the organization's workforce, compensation and benefit systems, introduction of new equipment, redesign of jobs, and employees' attitudes.

Murthy (2007) further discuss that change management is the managing of implementing changes in either IT, business processes, organizational structures or job assignments in order to to reduce risks, cost of change, and to optimize benefits. A big part of achieving organizational change is the individual perspective due to the importance of having individuals striving for the same goals. Murthy (2007) explains that there are four approaches to individual change; behavioral, cognitive, psychodynamic, and humanistic. For the managers this means that they have to get their reward strategies right, being able to link goals to motivation for the employees, understand the employee's' emotional states, and have the belief that employees want to grow and develop, respectively for the different approaches mentioned above.

It is easy to think of an organization like a machine with a lot of cogwheels, nuts, and bolts, representing the employees. The idea of where a change of settings or functionalities can be made with just a press of a button or decision is unsustainable. The reality is that change affects individuals, and they do not behave like cogwheels, they will react, resist, and accept change making it either hard or effective to perform organizational changes. Reasons for why individuals may resist some changes are according to Murthy (2007) e.g.:

- Personal loss of e.g. job security, salary, satisfaction of work, friendship and associations etc.
- Negative attitudes
- Lack of involvement
- Loss of status and authority
- Personal criticism
- Inappropriate timing

Change can however also be accepted and welcomed by individuals, and the main reasons for this is basically the opposites of the bullets above and also the opportunity to contribute and determine the change process and the desired goals. By utilizing and keep these factors in mind while trying to initiate and implementing changes, there will be less barriers to success and a more effective change process. (Murthy, 2007).

Collateral organizations is described by Murthy (2007) as an organization created to exist alongside the main organization in order to more easily solve problems. The main organization could have problems with solving some problems due to the constraints of organizational structures, rules, and regulations. By utilizing a collateral organization, the so-called problem-solving unit can work and cut across formal organizational boundaries in order to more effectively solve problems across the organization. This type of organization tends to have more freedom to operate in more creative ways than the formal organization that tend to have more formal rules, hierarchies, authorities, division of labor, and functionally specialized divisions. The collateral organization can be seen as an action task force, specialized in solving problems and finding opportunities of improvement.

Some key factors for successfully develop an organization or an improvement possibility are to:

- Take a holistic view - considers the interrelationships between different subunits of the organization, and also trying to anticipate and proactively solve problems and finding possible new benefits for the subunits of the organization.
- Secure top management support - organizational development and improvement efforts tend to fail if the support of the top management is lacking. Top management most often only support long-term financial beneficial efforts, and is a proper way to validate the sustainability and profitability of the improvement or change.
- Encourage participation - people tend to mostly commit to efforts and goals when they are participating in the development. When people feel that they can influence the results they tend to be more committed to the cause.
- Foster open communication - this will minimize the problems of e.g. resistance, and information research for the participative members of the change process.
- Reward contributors - by failing to doing this will probably condemn the future change efforts as word of mouth travel quickly in an organization. By highlighting

and offer individual improvements of e.g. way of working will enhance the motivation and commitment of the contributive member.

These key factors are pivotal in order to effectively and seamless succeed with changes and improvements in an organization. (Moorhead and Griffin, 1992).

2.3. Champions

A champion is described by Markham, Green, and Basu (1991) as a person which perform two different types of activities within the organization; adopting an innovation during its development phase, and promoting it within the organization. A champion promotes the innovation or project by e.g. "selling the idea" to others within the organization, and supporting the development process both emotionally and materially. By promoting the innovation or project, the champion contributes to the development by creating a better foundation and acceptance within the organization. (Markham, Green, and Basu, 1991).

There are a lot of different definitions in literature of what a Champion is. A description formulated by Smith et. al (1984) of Champions states that Champions sells the idea in question in order to obtain resources from the management. Thus, acting as the major salesman towards the management in order to accelerate the progress towards commercialization. Markham, Green, and Basu (1991, p. 219) defines a champion as "*a role where individuals are strong advocates for a project and generate positive behavioral support for an innovation during its development or work on behalf of the project in the face of organizational neutrality or opposition*".

2.4. Design Thinking

Design Thinking is a methodology to approach problem solving from a user-centered and collaborative standpoint. It begins from deeply understanding the users, their needs and motivations, to gain empathy about their reality. By collaborating one can get more insight and input than working on an issue alone, and by elaborating in concepts as soon as possible sets the stage for effective feedback. The fundamental idea behind the Design Thinking approach is to iterate; get feedback, create concepts and collaborate your way to a solid solution. Design thinking is often linked to the term "wicked problems" - referring to the method as an effective tool for approaching issues of complex character. (Brown, 2009)

The methodology is structured into five phases; discovery, interpretation, ideation, experimentation and evolution, see figure 2.

In the *discovery* phase one is immerse oneself into the issue and the context. To do this effectively one must enter this phase with an open mind; leaving their comfort zone and getting out of the office to engage in the daily activities of the targeted users. The key is to learn from the individuals and groups, the first-hand users of a system or activity. "Extreme" users are often those with strong opinions, which are desired to capture. This is done by

interviews, observations and participations of the individuals and their activities. The goal is to understand and grasp the issue in order to effectively approach it. (Brown, 2009)

Evolving from the discovery phase into the *interpretation* phase with the purpose to make sense of the information and observations made in the initial step. Information and observations are to be documented; personal details of the interviewees, their motivations and frustrations, memorable or surprising stories. The aim is to make sense of the findings, using Post-it notes to organize and cluster data - connecting the dots towards establishing insights. (Brown, 2009)

The following phase, *ideation*, means generating ideas. Basically this stage consists of several brainstorming sessions based on the insights gained from the previous stage. Allow for wild and boundless ideas at start, in order to reach a solid base for discussion, yet again by clustering and connecting dots. Finally concluding to one realistic idea that will be elaborated and evolved into a possible solution. (Brown, 2009)

In the *experimentation* phase the ideas become tangible prototypes. In this phase it is important to share the prototype, even early and rough ones, to get quick and direct response. Learning while creating and building to continuously refine the idea, capturing feedback and iterating the prototyping. (Brown, 2009)

Evolving the concept and idea into the phase of realization; sharing the concept with a broader audience, gaining acceptance and building partnerships. Share the story, pitch the idea, gather people and get them interested - build a community. (Brown, 2009)

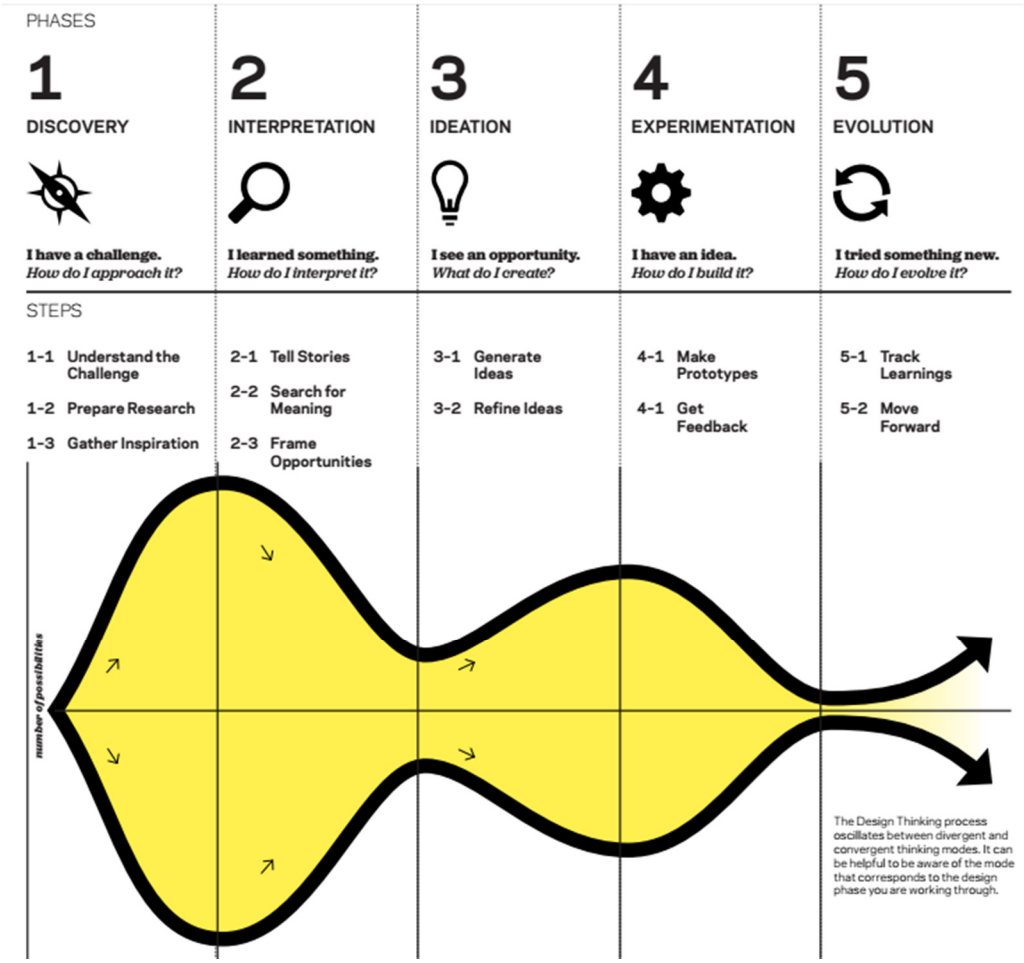

Figure 2: A short compiled description of Design Thinking and its stages. (Designthinkingforeducators.com, 2015)

Even though these phases are presented in a linear way, the process itself is non-linear. The phases can occur simultaneously, be repeated and iterated.

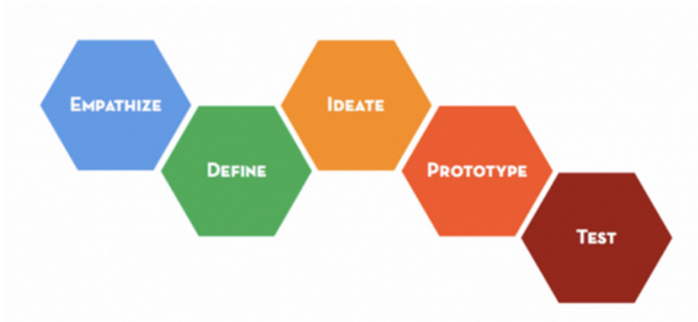

Figure 3: Different terms of the stages of Design Thinking. (Brown, 2009)

Although there are several definitions for the different phases of the Design Thinking process (see figure 3), there is a unified principle - an iterative, human-centered process for innovation.

Human-centered in the way that a major part of Design Thinking is about gaining empathy for those that the innovation is to be designed for. This is elaborated within the whole process by early engagement of concept creation and feedback. (Cohen, 2014)

2.5. User-centered startup methodologies

Design Thinking is as discussed in the earlier section a user-centered methodology that is utilized within existing organizations and is a relatively diverse discipline. However, there are a handful of well known user-centered methodologies as well. These usually have a more focused approach, either on software development or startup companies.

The uprising of the internet in the late 1990's brought not only increased importance of computers in everyday life, but also new business possibilities. Established companies created their own e-businesses, quickly boosting their market value. Entrepreneurs looking for the next big thing were not lagging behind to catch on the new wave of opportunity. Not surprisingly, online retailing became the one of the drivers of the dotcom bubble (Geier, 2015).

According to Butler and Tischler (2015) "Boo.com" was one of those, being one of the first with entirely e-commerce based business model. Their idea was to sell well known fashion brands online and many investors saw potential. The company rose $135 million in venture capital, and managed to spend all of it in only 18 months - before the product launch in late 1999 (Butler and Tischler, 2015). At that time the company had already employed 400 people in eight offices. The website was created with the latest technology and massive funding was spent on advertising (Wray, 2005). Seemingly everything was in place, but the company was forced to bankruptcy in may 2000 (Butler and Tischler, 2015).
"Boo.com" missed to recognize the customers needs and capabilities. Their advertising efforts did not reach out, where only mere 13% of internet users at that time knew about the company. The website design was too ambitious and heavy while most customers only had dial-up connections at that time, which did not have the capacity to load the website (Wray, 2005).

Research shows that startups fail 75% of the time (Blank, 2013). Similar statistic can be found for change initiatives within the traditional organization, where 70% of these fail (Nohria and Beer, 2000).
For startups, a new wave of theories and disciplines trying to provide better tools for startups to minimize risks of failure emerged. Among these are UC Berkeley professor Blank's (2013) model "Four steps to epiphany" and an evolved version by Ries (2011) described in the book "The Lean Startup".

2.5.1 Customer Development

Blank (2013) defines a startup as a temporary organization in search for a scalable and profitable business model. The Customer Development process is developed for the search of such, and is divided into four stages; Customer Development, Customer Validation, Customer Creation and Company Building (Lohr, 2010), see Figure 4 for an overview.

For this thesis the mindset of the Customer Development model was adapted, primarily entities of the first two stages. Similar to Design Thinking, Blank (2013) uses the term "getting out of the building" to describe the approach he wants to convey with the Customer Development mindset. He argues that entrepreneurs must leave the office and talk to users, customers, partners and other parties affected by or affecting their business. Ask questions like: *What are your customers top problems? Does your product concept solve them?* And, ultimately, draw a day in life of the customer.

The aim is to quickly create and test your hypotheses regarding all aspects of the business model, from the product or service itself to the channels of distribution and pricing. Finding a few enthusiastic users that will adapt your product or service before everyone else, and initiate a close relationship with these users, whom Blank calls earlyvangelists. He argues that these are *smarter* than you, since they will be using the product, therefore one must listen and learn from them.

The best learning, Blank argues, is the use of an *MVP*, Minimum Viable Product. This means that you create a prototype with the minimum set of features that can be used to share the vision of the product or service, illustrated in Figure 5. Since the Customer Development model focuses on agility and speed of this process; using the *MVP* allows for quick and easy input, revision and iteration. (Blank, 2006).

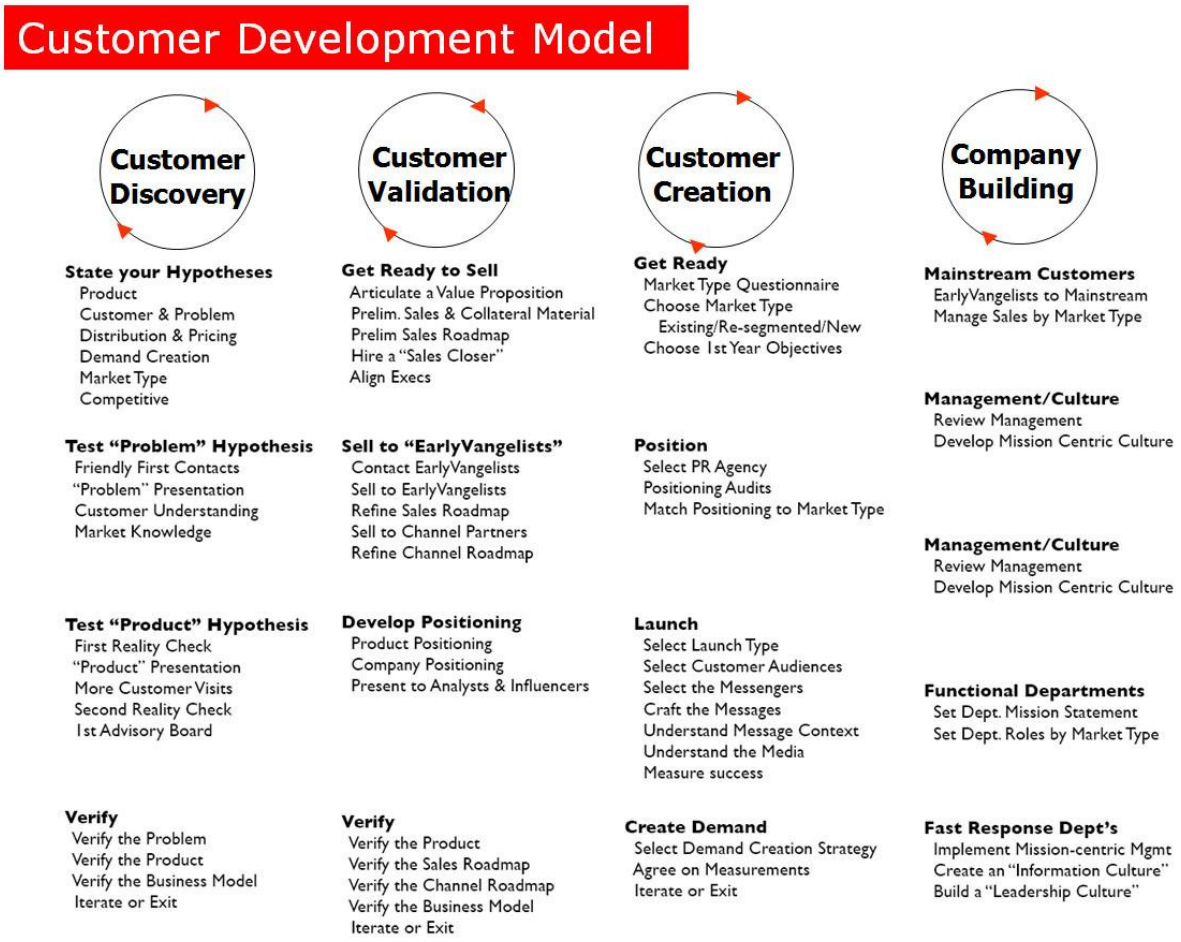

Figure 4. A compiled summary of the stages of Customer Development. (Blank, 2013).

Consequently, it is about embracing change and *build what is needed today*. Focusing on the process rather than the end result and flexibility over perfection, allows for frequent iterations with users and continuous improvements of the product.

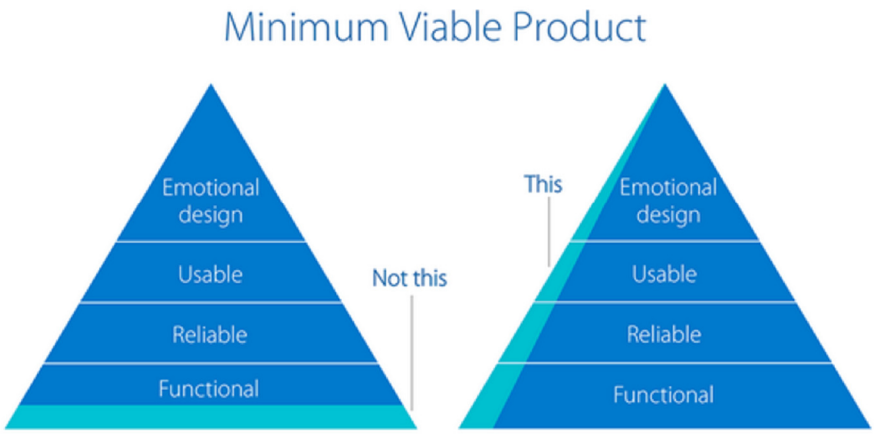

Figure 5: The Minimum Viable Product and what it should include. (Twitter, 2015)

2.5.2 Lean Startup methodology

This methodology builds on several of the theories described in previous subchapters and concludes an approach to creating continuous innovation.
Just like the story of *boo.com,* a startup can be on time and within budget, yet produce a product or a service that nobody wants. The Lean Startup is about to learn what is the right thing to build, what customers want and are willing to pay for, and deliver it as quickly as possible. This can be achieved by creating an iterative loop of continuous improvement by learning from users.
All too many companies/startups plan ahead every detail of their journey, and while they execute it they often do not get the result wanted. Lean Startup methodology is inspired by lean manufacturing, with the fundament that expenditures of resources for any other goal than the creation of value for the end customer is waste. This is target is constantly chased by continuous improvements. (Ries, 2011).

Ries (2011) created the concept "Validated Learning" and is one of the key concepts of Lean Startup. The focus lays on the process of learning how to build a sustainable business, rather than the end result. If the organization quickly learns what values the customers are willing to pay for, they can adapt the business accordingly and grow into a successful one.

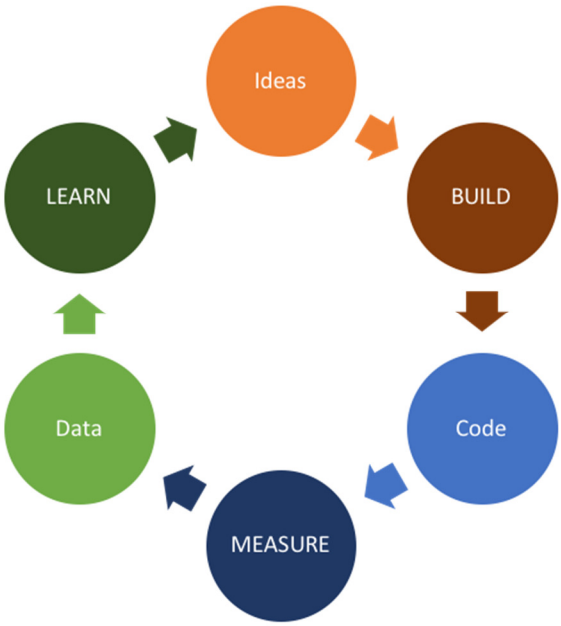

Figure 6: Validated Learning and its phases. (Inspired from Ries, 2011).

Figure 6 illustrates the process of Validated Learning, where Ries (2011) argues that the quicker a firm gets through this cycle, the greater chance you have to succeed. Learning the market values, quickly build upon these learnings and test for validity until you find the right formula. (Ries, 2011)

Rapid prototyping is one of the cornerstones of Lean Startup. Ries (2011) mentions Nick Swinmurn, and how he wanted to know if there was a demand for buying shoes online. He did this by photographing shoes in physical stores and displaying them on his website. If

someone would purchase them, Nick would return to that store to buy them at full retail price and send them to his own customer. Except for his own time, there was no loss for him, yet he got all the insight he wanted. This turned out to become *Zappos* later on, one of the world's largest online shoe retailer. (Ries, 2011).

Nick Swinmurn used a roughly designed website only to obtain the knowledge about customers' willingness to purchase shoes online, actually worked sufficiently for the customers to use. The Lean Startup methodology argues that finding your MVP, Minimum Viable Product, is the key. MVP is the minimum set of functions the product or service contains that will produce the highest return on investment versus risk. You simply should not waste time and efforts on creating something that customers have little or no value in - adding the risk of wasting the time and money invested. (Ries, 2011).

Fundamentally, what Lean Startup theory mediates is that the entrepreneur need a clear vision for what they want to accomplish. The common mistake is to go straight for the product and deliver something that does not fulfill the customers' needs. As demonstrated in figure 7 below, a clear vision needs to be established and solid, and upon that a strategy of how to achieve it. The product is only the means for to achieve the strategy. (Ries, 2011). Figure 7 below demonstrates how the structure between vision, strategy and the product should be constructed.

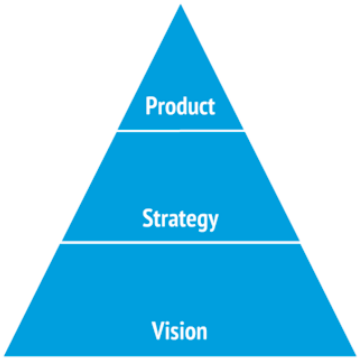

Figure 7: The vision as a foundation, the strategy to support it, and the product as a realization of the former two. (Ries, 2011)

2.5.3 Agile Software Development

Agile Software Development, or ASD, is a group of methods that self-organized and cross-functional teams use to create solutions by using a more user collaborative and iterative perspective and point of origin. Some of the strength of ASD is according to Stamelos and Sfetsos (2007) that the development process encourages continuous improvements, facilitates unforeseen and required changes even if they occur late in the development, and also high quality solutions.

The foundation of ASD is actually not a method in itself, but rather a collection of different methods and principles from e.g. Lean, Scrum, DSDM etc. However, the most important cornerstones of ASD is; iterative, incremental, self-organizing, and emergent. (Stamelos and Sfetsos, 2007)

The iterative approach in this context means that the team tries to find approximations to the solution from a minimum set of requirements at the initiation. A total solution design is often designed at the initiation as well, where the different subsystems are continuously developed and tweaked along with iterative repetitions. The iterative approach is beneficial when the problem is complex and has fast changing requirements.

The incremental cornerstone implies that each part of the system should be developed separately, gaining new requirements needed from other parts of the system, and then integrate them all together. In this way each part of the system is optimized and then adapted to fit the total system, creating a viable and well thought out finished system.

Self-organizing means that the team should organize itself, finding and selecting the specific competences they prefer, work structure, schedule, team dynamics etc. This is preferred as the team can by themselves complete the tasks in the best possible way.

Emergent implies three different meanings that is connected to the two previously cornerstones. It means that the structure and way of working is created naturally while it emerges. The nature of the system emerges along with the increments. The decided way of working emerges as the team self-organize. This also means that the learning is continuously during the project, and each new project is a new learning experience that is based on the iterative, incremental, self-organizing, and emergent techniques of the project progress.

2.6. Towards an integrated methodology created by the researchers fitting the specific setting - the CUT methodology

We have chosen to utilize aspects of all the above stated methodologies in this specific project at Volvo Trucks. Design Thinking is the main framework detailing the overall workflow of the methodology. Customer Development, Lean Startup, and Agile Software Development act as complements to areas where the researchers find Design Thinking lacking or being too broad in order to fully include the essence of some specific factors. From Design Thinking we chose its process as the roadmap, but also methods to handle data such as using and clustering post-its in order to find patterns and insights. Customer Development was included due to its focus of the value of creating solutions from the user perspective, and the values of creating and utilizing an MVP. Lean Startup has been chosen in order to include the mental mindset of finding value along the whole business chain. More specifically for the Thesis Project, this means to e.g. include the management in the process in addition to the users in order to iterate and adapt the solutions fitting their and ultimately the whole organizations needs and requirements. The Lean Startup parts helps to create a viable solution for the whole organization with the help of Validated Learning which is

utilized by the researchers. Lastly, Agile Software Development has been utilized as the creation of an IT platform was included in the Thesis Project. The ASD cornerstones of incremental and self-organizing have been included as the researchers find incremental progress favorable when having an iterative approach in order to be less vulnerable to sudden changes, and self-organizing in order to have a specialized team depending on the matter of interest.
Furthermore, the acquisition and utilization of Champions has been an integral strategy throughout the project and is considered as an important part of the researchers' overall methodology in order to facilitate the realization process, involve management, and create acceptance among decision makers.

This combined user-centered approach for change initiatives methodology created by the researchers was developed in order to fit the specific setting and prerequisites of the company and the project, and has been concluded subjectively by the researchers. This methodology will hereafter be mentioned as the "CUT methodology" - Corporate User Thinking. A visual representation of the CUT methodology is shown in figure 8.

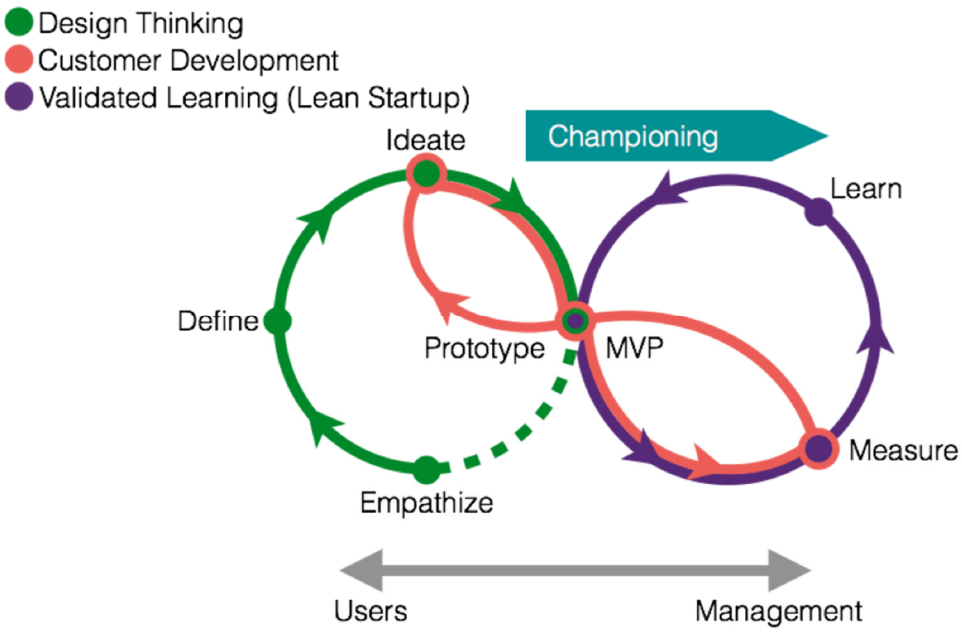

Figure 8. The process of the CUT methodology.

The CUT process starts with "Empathize" and follows the Design Thinking process until the "Prototype" stage. In this phase insights about the process and problems are gained from the users, and ideas generated. Thereafter, an MVP is created and enters the Validated Learning phase. In this phase the MVP will be measured; how smooth integration with current systems can be made, how management perceive its viability and how adaptable it is to the users. Key learnings are taken in consideration to further iterate the MVP. As the process enters this phase, there is a problem formulated and a vision to display, therefore Champions need to be identified and engaged to drive the project towards realization. Championing is a crucial step to engage management and enable full potential of the initiative.

Customer Development is a continuously ongoing process of integrating users and management into the iterations - linking the corporate vision and usability for the users. This while anchoring the initiative along the whole spectra of stakeholders.

3. Description of the Thesis Project and context at Volvo Trucks

This chapter introduce the Thesis Project that was performed for Volvo Trucks. Due to confidentiality all details are not disclosed. However, the Thesis Project's overall settings, organization, and characteristics are presented in order for the readers to obtain a sufficient understanding of the project's complexity.

3.1. The project context

The Thesis Project was performed at the Global Brands department at Volvo Trucks. However, the department of product development, an IT was also involved in this project. Within these departments there was several divisions and important stakeholders that were included such as; Product Manager, Purchase, Decision Bodies, Sales, and the Product Development representative. Hence, the improvement project was cross-functional and had a lot of stakeholders and affected employees.

A project group with different competences from several including divisions had also been assembled before the researchers were assigned to the project. The project group consisted of six members, without the researchers. The project group initially had weekly meetings where developments were discussed, goals set and objectives assigned. Some of the project's characteristics were; uncertainty, a change initiative, and not a part of the project members' formal work assignments. Therefore, the project was not a high priority for the members. These project characteristics created the need of members that could drive the project forward, coordinate, and work with the project full time in order to successfully and effectively develop proper solutions and end results. Hence, the researchers were assigned to the project.

3.2. The Thesis Project at Volvo Trucks

The project that the researchers were assigned to (i.e. the Thesis Project) considered an introduction process of a certain product. The product can be considered as a standardized product that is not further refined by Volvo Trucks. The product must go through several decisional and administrative processes by various divisions and competences responsible for the different aspects. The different decisions are quite diversified as they regard e.g. product portfolio, and budget aspects performed by various decision makers. The administrative work regard several aspects and divisions within Volvo Trucks. The administrative work is a part of e.g. formal decision forms, technical data needed in various systems, descriptive forms between different divisions within Volvo Trucks, and also market regarded aspects to sales representatives and end customers. The decisions and administration followed the standardized introduction process that is used for the majority of the products. One important note is, as mentioned above, that the product this particular process regarded was not further refined within Volvo Trucks.

The standardized introduction process is however considered by most employees to be favorable for the products that, in turn, are further refined. This is due to that the majority of products are of that characteristic, and the standardized introduction process is more or less customized to those products.

The total lead time for the introduction process of the specific product was ten and a half months from registration by the suppliers until they were utilized in start of production. This is problematic since the product gets introduced late into the market. The process performance is considerably worse than several competitors.
Another major issue is the compatibility between different information mediums, the number of intermediaries, leading to the risk of human errors due to manual labor. Multiple documents with different types of data and parameters of the product are utilized within the company in order to fulfil all demands and necessities of the various divisions within the company. Updates and changes of data require that all forms and systems are updated as they are not synchronized and interconnected. This and the aspect of performing human errors during manual input of data consumes much time and resources each year to correct issues followed by the way of working. Another consequence of these issues are the possibility of having the introduction delayed.

Another problem was that the sales representatives were presented with an insufficient amount of product data in their main IT tool during the sale occasion with the customers. The data available was not considered by the project group to be sufficient in order to offer the customers with the optimal configuration and offer full support. During the whole introduction process, new documents with relevant data for the downstream activities are created in order to deliver proper data more effectively. However, the process and lack of resources results in delivering the sales representatives and customers with insufficient data. Although all data is accessible for the sales representatives, it was considered that finding and accessing the data required excessive amount of time and efforts in order to be a viable option. To conclude this problem, although all data is available within Volvo, the data availability is decreased during its flow towards the customers and is described visually in figure 9.

Figure 9. The decreased availability of product information towards the end customers. (Created by the researchers).

The improvement project had three different and somewhat interconnected goals; reduce the lead time of the whole process, improve and secure process steps in order to eliminate the possibilities of faults to occur, and to deliver sufficient information to the sales

representatives. This was to be achieved by i.e. developing a IT platform with new functionalities that would help achieve the different goals. Some initial ideas such as the use of a IT platform were already initiated before the researchers had been assigned the project.

Another important aspect of the Thesis Project was that it was not decided by the management to implement the improvements. The project group had been assigned resources in order to develop and test a solution, there were no guarantees that the project results would be implemented within the company.

3.3. The researchers involvement in the Thesis Project

What was then the researchers' tasks in the Thesis Project? As mentioned earlier, the project team were in need of resources that could drive the project forward, coordinate, and work with the project full time due to lack of priority and time for the initial members. The initial tasks were to learn and understand the whole product introduction process, the limitations, the problems, and the root causes to the problems by reading documents, and interviewing responsible employees for the different areas and parts of the product introduction process. Thereafter, the researchers coordinated the development of both finding and developing solutions simultaneously for the different areas and systems with the help of the other project members and other responsible employees. Furthermore, the researchers analyzed and concluded necessary actions and necessities between the interconnected and cross functional areas, systems, and down- and upstream activities. Other activities that was performed continuously throughout the Thesis Project but that intensified at the later stages were to "sell in" the ideas and the project for important stakeholders and management in order to gain acceptance, and initiation of the actual realization and implementation of the solutions.

The researchers have used the CUT methodology, as discussed in the end of chapter 2, when performing the tasks mentioned just above and is elaborated and explained in more detail in chapter 5.

4. Research methodology

This chapter describes the methodology employed during the thesis development. The main data collection methods are described in addition to the discussion of research quality.

4.1. Research design

The methodology that has been used is an action based approach where the researchers has actively been a big and driving part of an improvement project. Denscombe (2014) describes action research as a participative research where the purpose is to solve a particular problem while also producing guidelines for best practice. Furthermore, the research methodology is most often used in order to solve an immediate problem or to gain a better understanding and method of solving and addressing issues. Denscombe (2014) further discuss that an action research involves to actively participate in a change situation while also simultaneously conducting a research.
The Thesis Project involved an immediate problem that was in need to be solved in order to increase internal efficiency while also eliminating some root causes that created consequences that directly harmed the company. Further, the researchers were included in a project group responsible to achieve the desired results. As this project were outside the project members everyday work responsibilities, the time and available efforts were limited. Consequently, the researchers were given a central and driving role of the project as they could utilize their full time to the project. Hence, by participating in the project and given such a central role and freedom, the researchers have utilized the methodologies of Design Thinking, Lean Startup, Customer Development, and Change Management to lead and run the project.

The other members of the project were not informed that research described above was conducted simultaneously as the actual Thesis Project. This was done in order to not draw attention from the objectives of the Thesis Project, and to not interfere natural behavior or think process, which could prevent and delay the progress.
By studying, interpreting, and analyzing the results, the direct value for the firm, and the development of the project the researchers have been able to present that a different methodology can render in successful results. Important to note is that no comparison with other methodologies has been done, nor has the results been benchmarked in any way, the research purpose is solely to show that successful results can be achieved with a different methodology than conventionally used within the company.

While performing an action based research it is important to draw conclusions based on collected data from e.g. observations and interviews. Otherwise, for example, it becomes more as a newspaper editorial were things thought to be true is written (i.e. opinions), rather than strong arguments, interpretations, and conclusions based on discussions and analyzes of collected data. Therefore, sufficient data collection during the whole research process is important in order to perform a proper action research. (Johnson, 2008). The researchers have secured sufficient data collection by conducting continuous interviews, field notes, document

reviewing, and used them as a foundation for the discussion. More details of the data collection methods can be found below.

4.2. Data collection

The data collection process can be generalized in two different stages; the quest for understanding the environment, and the project execution. Each of these stages has been executed using different kinds of methods and is described below.
The research applied a qualitative approach for data collection where the utilization of different user-centered methodologies was performed in order to discuss and analyze their viability and perceived value in a large organization. Bryman and Bell (2011) discuss that qualitative researches are more focused on words rather than quantifications, and is more suitable when dealing with e.g. social contexts, human interpretations, and more abstract matters that is hard to quantify. The thesis results can not be quantified or does not bring any academic value by being quantified due to the more social context, focus, and subjective interpretations.

4.2.1 Understanding the environment

In order to execute the project at the company, the researchers needed to understand the environment and its different systems, work roles, and the root causes of the problems. This was performed by mainly semi-structured interviews, but also unstructured interviews. Creswell (2003) discuss that unstructured interviews are a way of letting the respondents speak freely of the matter which may surface unexpected but valuable aspects that can be neglected with other types of interviews. Creswell (2003) further discuss that unstructured interviews are preferable when the researchers' initial knowledge of the matter is limited and may be beneficial to their understanding. As the researchers' knowledge and understanding of the project and the environment was more or less non-existing, the initial interviews with various employees of the different systems and work roles were all unstructured.

When the researchers considered that their understanding and knowledge of the matters were sufficient in order to dig deeper, semi-structured interviews were conducted. Bryman and Bell (2011) describe that semi-structured interviews are beneficial when an initial understanding and knowledge of the matter has already been acquired. The questions are conventionally leading but offers open endings in order for the respondents to offer a broad answer. The questions can also have follow-up questions in order to acquire more deep understanding. Consequently, the interview method offers the flexibility to dig deeper into specific questions in order to get more rich information of the topics. (Bryman and Bell, 2011).

This type of interviews was conducted throughout the entire project, while the unstructured were mostly performed at the initial phase of the project. The researchers performed 10 unstructured interviews and 15 semi-structured interviews throughout the initial phase of the

project[1]. Notes have also been taken during all interviews by the researchers in order to capture impressions and thoughts of the researchers.

The researchers also obtained various documents and PowerPoints describing the different processes and systems which helped to gain a better understanding as a complement to the interviews.

4.2.2. Data collection during the project execution

Interviews similar to those described in above section, interpretations by the researchers, and co-operative workshops with the responsible employees has been performed throughout the project execution phase. However, the most relevant methods have been the actual mental mindset and practical progress of the CUT methodology.

In this phase, 15 unstructured interviews and 21 semi-structured interviews were conducted. The reason for the large amount of unstructured interviews was due to the grand project scope. A lot of functions, personnel, and systems were involved and a large amount of improvement possibilities were included in the scope. The semi-structured interviews included workshops where possibilities were discussed and defined.

Field notes was also continuously taken throughout the project, and included both subjective interpretations, and important facts and quotes. The field notes were useful in order to remember the social environment, context, and subjective feelings and thoughts during the meetings. Bryman and Bell (2011) describes field notes as notes describing the researcher's experiences and observations while participating in the research context. Furthermore, field notes can often refer to feelings and emotions during the observations (Bryman and Bell, 2011).

As mentioned in chapter 3, the details of the practical work and the results of the project is not the focal point of this thesis. Further, the details are not possible to discuss due to confidentiality. However, it is the actual work approach and methodology that is the matter of interest in this research. The researchers have used the CUT methodology, understanding the problem and the users, defined the problem, made prototypes, and tested them. Furthermore, Champions have been used in order to gain acceptance and to anchor the idea among important stakeholders, while also following important factors of conventional change management theory.

[1] The interview guides can unfortunately not be presented in this thesis due to confidentiality reasons at the company where the project was performed.

4.3. Reflecting on research quality

As this research deals and reflects on the actual CUT methodology that was used for a company specific project by the researchers, it is hard to discuss the more conventional validity and reliability. Bryman and Bell (2011) discuss that reliability e.g. deals with the level of replicability of a research. Due to that the Thesis Project is unique, performed once, and established by various members that most likely will not work together again, it is impossible to replicate the project and its results. The CUT methodology utilized in the Thesis Project can of course be used again, but the results can not be replicated due to the subjective and unique nature of this specific research. Validity is often described as what really is intended to "measure" really is "measured" during the research (Bryman and Bell, 2011). This research is of a more qualitative nature, which complicates the use of the term validity even further as nothing is really measured.

One of the biggest issues with this research is the ability to validate if the research methodology has been performed properly. As the project only can be performed once and due to that the researchers has chosen not to benchmark with another project, it is difficult to benchmark the results, and therefore very reliant on the subjective opinions of the researchers. This can be considered as uncertain and unreliable, yet, Bryman and Bell (2011) argue that certain richness and insight cannot be gained in any other way than subjective opinions and discussions. The researchers are interested in showing that the CUT methodology is possible to use within an organization unaccustomed to something similar, and to show how specific value has been created by using this methodology in the Thesis Project. The researchers interpret that validation with success factors from change management theory along with project members and other stakeholders' opinions are enough to properly assess the results.

One of the drawbacks with performing an action research is that its difficult to generalize the findings of the research. This research shows value gained by using the CUT methodology for the specific project, but it is not certain that it could be implied generally for all similar projects. However, the research still contributes academically by showing that values could be derived from a real project by using the CUT methodology.

The confidentiality of the Thesis Project is a limitation to achieve the optimal research quality of this thesis. The researchers has not been able to describe detailed activities in order to give the reader clear examples which can be used to determine if the methods and the CUT methodology has been properly performed. However, due to Volvo Trucks confidentiality principles the researchers can not offer the reader the detailed information which must be considered as a drawback.

5. Performing the Thesis Project using the CUT methodology

This chapter presents how the researchers performed the Thesis Project and how collaboration with various stakeholders and users was created. This chapter provides the necessary information in order to have a clear discussion in the next chapter. This chapter is partly structured in the same way as the conventional Design Thinking process that is described earlier in chapter 2. The chapter has also some additional parts in order to fully include the different elements of the CUT methodology created by the researchers. Hence, a chronological description of the Thesis Project is presented. The chapter is concluded with some challenges met during the Thesis Project execution.

5.1. Mental mindset built on the user-centered methodologies

During the whole Thesis Project, the researchers has had the underlying knowledge and understanding of the different user-centered methodologies (i.e. Design Thinking, Customer Development, Lean Startup and Agile Software Development). The researchers have had previous knowledge of all the different methodologies. The user-centered mindset has constantly been present and has affected every action and decision the researchers have taken. Furthermore, methods associated with these methodologies such as using, clustering and structuring post-its has been used. This mindset has been the underlying reason to why we have acted and worked as we have done during the whole Thesis Project, and is more detailed explained in the following subchapters.

5.2. Empathize

Finding relevant users

At the initiation of the project a core group of stakeholders consisting of six employees was put together. These were more or less directly linked to the affected process as their functions are covering different aspects of it. The core group was diverse in the sense of specialized area of knowledge.

This core group of stakeholders were initially the key source of information for the researchers. Information and the different aspects of the affected process' current state was shared through interviews and group meetings. The complex character of the process involved several other processes, needed extensive amount of effort to grasp. Although these processes are well documented in databases, they are difficult for an outsider to understand, while they also do not capture any real life issues that users are facing. Therefore, it was of great essence to identify all affected first-hand users in order to let them explain the processes while at the same time *empathize* with them.

The core group of stakeholders are highly competent employees, with good knowledge of parts of the process belonging to their area of responsibility. Naturally every part of the workflows involved in the affected process cannot be described to full extent by anyone else

than the first-hand users of it. Therefore, through referring from already established relations with users, the researchers were enabled to get in touch with further users to gain expanded understanding of the processes.

The initial approach was aimed at getting to know the users and their processes - letting the users teach; their role within the process, how they are contributing and invite them to speak freely about their view on the process.
While teaching the researchers about their work and the process, the users would demonstrate their tasks, often times they would emphasize on issues they encounter. Consequently, the users got involved in the initiative and provided further key users for the researchers to deeper understand the process - a cumulative process was initiated.
While the progress of interviewing key users was going on, the underlying aim was to involve these users into the initiative - making them feel like they are contributing right from the start.
Soon enough a network of users was acknowledged, interviewed and involved.

Learning the current processes and understanding the users

While building a network of users by interviews, knowledge about current processes were gained. The interviews were unstructured, due to the fact that the researchers had little knowledge about the processes at first, but also since the aim was to let the users speak freely and acknowledge the issues themselves.
The researchers would call for meetings at the users' own workspaces, allowing them to practically display the tools and systems they use. This enabled the researchers to learn, and due to the open dialogue also question their way of working; tools and systems they use, methodologies etc. Yet this was done in the way that ideas from the users themselves were encouraged, rather than suggestions from the researchers.

5.3. Define

Mapped out the processes and finding interrelations

As information was continuously collected, a process of documenting and mapping was initiated. Meeting notes were extensive, containing both observations and thoughts, as well as reflections similar to a diary. What seemed to be key information and important observations were concluded onto post-it notes and clustered on the wall in the researchers' office where an easy overview was accessed. Also, frequent discussions and brainstorming sessions were held with the assistance of the office whiteboard were held, to share insights between the researchers. Individual observations were shared and stories told to reach a common understanding of the process and potential issues.
This process was continuously iterative, as the post-it wall and whiteboard in the office were constantly updated with new information and insights.

Understanding the issues and where they are rooted

Constantly organizing, re-organizing and clustering data, information and observations to gain understanding of the situation. This allowed for both learning the process and gaining insight about the issues.

A few users that showed particular interest for the issue were selected to be the "go-to" stakeholders. These users also saw potential in the initiative, and were ready to use the opportunity to push their interest. Another characteristic of these users was that they also had broad understanding for the process. One of the major characteristics of these users were also that they saw potential in the initiative. These users were successively getting more involved as the researchers approached them frequently with questions about the processes as well as asking for their opinions regarding issues.

5.4. Ideate

Together with key users of systems generating possible solutions

The ideation phase evolved naturally as the meetings and discussions with the users went from learning/empathizing to the fact that the researchers were gaining better understanding of the process. This allowed for taking the meetings to a creative and ideating state. Setting the stage for creative discussions and brainstorming sessions. Weekly "product development" meetings were set up and some key users that were very engaged to participate and experts in their field had a standing invitation.

The same method of using post-its as described in subchapter 5.2 was also used while "ideating". By categorizing and clustering e.g. different factors, necessities, systems, and wishes of the users, the researchers obtained a visual and interactive tool which helped with the creative ideation process. This method was performed in collaboration with different users of concern, but also individually (i.e. both the researchers together) due to lack of available time of the users. Details of these activities can due to confidentiality reasons not be presented in this report.

Ideas were documented and brought to all affected parties to be opinionated and/or further developed. This allowed ideas to expand to grasp greater portions of occurring issues or deflate if they were considered insufficient.

5.5. Prototype

Frequent prototype iterations were made during the Thesis Project. These were either implemented in the IT platform directly, constructed as visual concepts or hypothetical solutions regarding the introduction process. This subchapter describes the prototype activities performed during the Thesis Project regarding the IT platform and introduction process.

5.5.1. IT platform

The IT platform was continuously iterated and developed as new demands emerged, and it can be seen as the single largest and most frequent prototype. Close collaboration was established with the designated IT developer and the affected users which the IT platform is aimed to serve. Meetings and workshops were conducted on a regular basis to conclude users' needs and desires for the new process, then translating those to the supporting platform specifications. The researchers and the IT developer had the most extensive and frequent workshops, where different solutions were discussed, designed, and developed. Although there was some adaption to each user, approaches and work steps used during the IT platform development can be concluded to the following method:

- The researchers discussed with the affected users finding encountered issues and their underlying reasons. Thereafter, together acknowledge the users needs and desires for the new process.
- Needs and desires were translated into specifications and possible solutions were either agreed upon with the users, or created shortly afterwards by the researchers.
- A mockup of the solution was quickly created in PowerPoint by the researchers, to visually be able to present the idea in the IT platform-like environment.
- The PowerPoint mockups were presented, described, and discussed with the IT developer in order to clarify the actual realization possibilities.
- When the IT developer implemented the functions in the IT platform, an iterative process began with the users, researchers and the IT developer to further tweak, change, and improve the solution.

The programmer was not accustomed to this way of working as they usually acquire a list of specifications of the entire solution. This means that the programmer can control and adapt the work and time with regard to the deadline of the assigned tasks. By utilizing the CUT methodology, the programmer was introduced to a different way of working which sometimes was perceived as unproductive and time consuming by the programmer. However, the work method was necessary in order to utilize to the overall methodology used by the researchers for the whole project.

The work methodology utilized with the programmer and the users generated approximately thirty PowerPoints and twenty tools and design aspects implemented in the IT platform. The tools, functions, and design for the IT platform were most often implemented without making any major changes afterwards, simple design aspects not included. However, in some cases the solutions and designs were changed drastically after iterations with the users. The reason for the drastic changes were due to new insights or identified issues that emerged after discussing with additional users which highlighted flaws of the solution. The flaws were both linked to the direct users of the solutions, or incompatibility with other systems and downstream- or upstream activities. As the scope for the utilization of the IT platform was so extensive and continuous developed in parallel with the exploration of the requirements and

possibilities, new insights and issues were naturally identified during the iteratively work methodology.

5.5.2. Introduction process

The original introduction process was presented in a two-column table with a short description of the activities in the left column and specific dates of completion in the right. Figure 10 represent the setup of the mentioned table, which is filled in with random text due to confidential reasons. The table was the representation of the official process which were to be changed and improved as a result of the improvement project. As the researchers and the users of the process developed, added, and removed activities continuously and iteratively, the researchers used an interactive table that was constantly changed with new, deleted, and changed activities and dates. The interactive table were used to easily and visually present the developments of the introduction process to various stakeholders and users. The interactive table was of course not sufficient to describe and keep track of all changes, more detailed descriptions was documented, but was used to present and initiate discussions with users and stakeholder in an effective way. The end result presented after the improvement project was the final version of the interactive introduction process together with descriptions and reasoning.

Nunc venenatis lectus at massa vulputate faucibus	W1526
Nam eu diam imperdiet, varius odio in, accumsan velit.	W1523
Donec quis tellus suscipit, luctus nisi quis, egestas enim.	W1520
Sed euismod nisl eget leo rutrum, sit amet blandit quam pulvinar	W1519
Raesent non nunc ac eros egestas gravida vitae non metus.	W1512

Figure 10; Representation of how the introduction process table were structured. (Created by the researchers)

5.6. Validated Learning and Championing

To gain acceptance among decision makers was the next step in the process. If the initiative and solution were acclaimed and anchored among the users, the improvements cannot be implemented if they lack the required acceptance and decisions from the top of the organizational hierarchy. As the “top-down” organization require resources and efforts to be approved by the management before implementing major improvements and changes. The researchers were involved in acquiring and anchoring the acceptance among these important stakeholders.

As mentioned earlier in this chapter, the Thesis Project and its solutions were developed from “bottom-up”, meaning that the solutions were developed together with the actual users rather than from the management. To maintain the “bottom-up” perspective while anchoring and

gaining acceptance for the solution, the decision makers were not involved before well developed solutions/concepts could be presented, and the support and involvement of various users were achieved. The decision makers were involved when clear and viable prototypes could be presented and justified, as well as having the support of and involvement of the actual users.

A systematic approach was adopted for the approach of decision makers. As these are working with prioritized schedules for improvement decisions, they need to be aware of an initiative as soon as possible. Yet, the issue need to be important enough, and the solution for it presented in a comprehensible way. Therefore, when the time for involving the decision makers emerged the researchers decided to approach them in a alternate way than with the users. While users were involved in identifying the actual problems, emphasizing, and develop solution by cooperation, the approach were considered to be insufficient in regard to the decision makers due to their different perspectives, incentives, and priorities. Meetings with different decision makers were booked for the researchers to present solutions affecting their area of responsibility and thereafter discuss them together. The researchers opted to gather information of what the main interests and so-called “soft spots” were for the decision makers and adjusted the presentations and approach thereafter. For instance, for the decision makers responsible for sales regarded issues the problems, losses, and possibilities of improvements of the sales process were primarily highlighted. The researchers also tried to emphasize their perspective in order to present and discuss the problems as a member of their group.

One of the main tools for gaining the decision makers’ interest were to always have an MVP in addition to being able to present the viability of the solutions. The viability of the solutions were achieved by having them developed in cooperation with the main users that both know the technical limits and the main necessities of the solution. The MVP served as a tangible example for the decision makers to utilize while discussing the ideas with their groups.

The feedback from these meetings were considered to be of high importance and were always treated with the highest priority. The researchers always prioritized answering questions that could not be answered at the time from these meetings in order to keep momentum and providing conditions to continue the developments. In some cases, there were several different solutions presented with different degrees of required resources, efforts, and features in order to not only present a solution that could be considered as unrealistic or incompatible with i.e. other systems, rules, and policies. By having different types of solution the researchers attempted to become flexible depending on the feedback of the decision makers. Depending on the feedback form the decision-makers other solutions were sometimes chosen to focus on. If none of the solutions were possible the researchers used the feedback and the new knowledge in order to pivot and iteratively, with the users, create new solutions. Hence, updating and changing the MVP based on the new learnings from the iterations with both users and decision makers.

Another strategy that was utilized by the researchers was to approach and gain the acceptance and support of various Champions (described in chapter 2.3). Four Champions were involved during the Thesis Project, where two were involved initially and part of the project group. The other two were involved during the course of the Thesis Project, whereas one had a very important role in the company and the top management. By being given a chance to present the Thesis Project to the influential employees at Volvo Trucks, the researchers managed to acquire their full support and approval of referring to them when discussing and negotiating with decision makers and other competences within the company. The Champions also helped to push and involve relevant employees to help the project team, and also spreading the word of the Thesis Project within the organization.

5.7. Challenges

Using a different work methodology at a big organization with standardized processes and way of working can be problematic. The researchers recognized one specific area where this incident recurred more frequently than others. This specific area was the IT department and more specifically the cooperation with the programmer. Their conventional way of working is by receiving a clear and more or less definitive specification by the purchaser (i.e. the department or group that ordered the software changes or new software services) and then deliver the finished product before the agreed deadline. However, the applied CUT methodology for the Thesis Project used by the researchers does not comply with the conventional way of working at Volvo IT. As described earlier in chapter 2, the CUT methodology is more explorative and iterative. This created some conflicts and discussions as a lot of changes were done continuously during the Thesis Project.

Another challenge that occurred was the resistance and so-called “shielding” of some employees due to proposed changes that would affect their work tasks. The explorative and broad nature of the CUT methodology resulted in interviews and discussions with a lot of affected employees. Some of the proposed solutions were directly either changing or replacing activities performed by employees, and this resulted in some employees having a defensive response and withholding information as they felt threatened. This resulted with the need of finding answers elsewhere.

The broad scope of the Thesis Project and the constantly growing number of involved employees and stakeholders created some issues for the researchers. Continuously exploring and iterating with new identified stakeholders and affected employees required a lot of time. Moreover, the solutions required cross-functional cooperation and the Thesis Project had, for the employees, unfamiliar characteristics and way of working. This caused some issues for the cooperative work of finding cross-functional solutions due to lack of time, resources, and inexperience of cross-functional work. These factors created some problems as the researchers did not have the necessary time to fully involve all the affected employees and have effective cross functional cooperation.

Volvo Trucks are a so-called top-down organization, where e.g. decisions and initiatives are originated from the ones with the highest rank within the organization. As the CUT methodology utilized by the researchers, and the characteristics of the Thesis Project are of a bottom-up standpoint, difficulties occurred. Due to these factors, activities such as gaining acceptance among decision makers, as previously described in this chapter, spent a lot of the available time and resources of the researchers. This time and resources could instead have been spent to develop the actual solution, but the organizational structure, which is very conventional at large firms, hindered the researchers.

6. Discussion

This chapter presents a discussion of the performed Thesis Project using the CUT methodology. The discussion mostly relies on subjective interpretations due to the characteristics, but uses theory as a foundation of the discussion. The chapter consists of perceived positive and negative experiences of using the CUT methodology, as well as discussions of future adaptation of the CUT methodology.

6.1. How can the CUT methodology overcome conventional difficulties with change management?

The two identified difficulties that the researchers have chosen to discuss based on their experiences are; the reduction of individuals' resistance among the users, and the acquisition of top management support. The former mentioned difficulty was eliminated by utilizing the CUT methodology, while the latter difficulty was overcome by e.g. acquiring Champions, and by considering both bottom-up and top-down interest simultaneously.

6.1.1 Reduction of individuals' resistance

While performing change either in the organizational structure or work structure, one of the biggest issues is individuals' resistance (Murthy, 2007). Resistance is of course of different fatal levels for the actual change depending on the status and hierarchy power of the individuals. Resistance from a top manager will most likely stop the change, while resistance from a single user will not. It is however interpreted that the collective resistance of individuals has a greater effect of stopping change. The intended results of Thesis Project were affecting a lot of different users across the company, which made the importance of individual support vital for the Thesis Project. Furthermore, as many of the solutions were not yet developed, and intended to be developed in cooperation with the users, the support and non-resistance of the users were considered as vital for the researchers and the Thesis Project.

Murthy (2007) mention some reasons for individuals' resistance; lack of involvement, personal loss of e.g. satisfaction of work, personal criticism, and negative attitudes. The researchers believe that the utilization of the CUT methodology during the Thesis Project has proactively dealt with these reasons in a positive way. This is further elaborated in the following sections below.

By involving the users in the Thesis Project and the iterative development of the solutions the users has been offered a chance to propose their ideas, and also actively develop the solutions which best suit their needs. Hence, the affected users have been involved; their ideas and thoughts were considered, and therefore eliminating a reason for individual resistance.

As one of the main aims of the Thesis Project were to reduce manual labor and facilitate work activities, not complicate them. Many of the work activities were considered by the users to be double work and obsolete as methods to facilitate and enhance the data security of

the activities exist today. By involving the users, they also got the chance to bring forward other issues which were relevant to the Thesis Project that was not thought of by the project team. These issues were most often brought into the project scope and included in the possible solutions. This was possible due to the iterative CUT methodology and the fact that the solutions were developed bottom-up.
It is interpreted by the researchers that by offering user-centered methods, solutions to user issues, and more effective work activities, the satisfaction of work ought to be enhanced for the users. Further, the response and positive feedback that the researchers received by the users strengthens this interpretation. More generally, it is interpreted by the researchers that the CUT methodology will most often enhance the users' work satisfaction as they receive involvement and opportunities to develop their own solutions that best fit their needs.

Personal criticism could in this case be directed to the users actually performing the errors during manual labor and obsolete work activities. However, it is interpreted by the researchers and the project team that these factors were not the root causes of the issues, but the actual work methods and tools. By involving the users that performed the errors in order to identify the root causes and also develop solutions, it is interpreted that this helped to change the focus from personal criticism to the actual root causes for the users causing the errors. Hence, eliminating a factor for individual resistance. By creating a scenario of belonging, involvement, and opportunities to perform desirable changes as discussed in the paragraphs above, it is interpreted that a lot of negative attitudes of individuals is eliminated as a result of these factors.

6.1.2. Increasing acceptance and priority among top management by acquiring Champions

Champions, individuals that sells the idea within the organization, create acceptance among stakeholders, and obtain resources from top management, are important for any project or innovation (Markham, Green, and Basu, 1991; Smith et al. 1984). The importance was vital as well for the Thesis Project as the Champions facilitated acceptance, support, and faster decisiveness. The researchers identified four Champions during the Thesis Project progression, two of them were a part of the project team, while the other two were from different parts of the organization.

The two Champions that were in the project team were very driven and primarily helped to sell in the idea among different users and stakeholders that got involved, but most importantly they utilized their network of contacts within the organization. The researchers were new to the organization setting and thus did not know how to progress with the actual realization of the solutions. While the researchers could manage to develop the solutions and analyze the process, we did not know whom to talk to in order to progress the actual realization of the solutions. While these tasks were by no mean impossible for the researchers to perform, the Champions the search for the right stakeholders, and also higher priority and credibility among the important stakeholders required for the project progression. The researchers experienced a higher level of prioritization of the Thesis Project matters when the

Champions who knew the stakeholders before and had some kind of influence among them took the initiatives rather when the researchers themselves tried to. Hence, meetings were scheduled faster and the matters discussed was brought forward faster within the organization, even though the champion were present at the actual meetings or not. It is interpreted by the researchers that Champions with influence and higher status bring a higher level of decisiveness even though the presented content to the stakeholders are the same. The researchers noticed a big difference even when e-mails sent included the Champions, rather than without in term of responsiveness. Hence, it is interpreted that only by being able to show the support of Champions with high status and influence within the organization results in higher responsiveness and decisiveness from the stakeholders, even if the champion is not actively adding anything to the project progress. Having Champions physically selling the idea was considered as a great bonus, as they knew how to talk to various stakeholders and what interested them.

The other two Champions that supported the Thesis Project progress was not part of the project team facilitated new contacts and more flexibility in process changes. The researchers had a problem to change a certain process as the process owner insisted that changes were impossible. The researchers initially dropped that idea after the process owner's statement, but returned when the researchers met the process owner's boss and managed to plan a meeting. The researchers presented the prototype of the process and the overall Thesis Project and received a good response and directly opposed the process owner's statement and presented a similar possible process that the researchers had proposed. The new champion that supported the Thesis Project and its potential continuously supported and promoted the project from that point. Had the researchers not continued to pursue the prototype realization of the certain process, the improvement may not have been discovered at all. It is hard to discuss what caused the process owner to give the declining statement even though it actually was possible to perform the change, but it is interpreted that lack of knowledge and personal resistance could have been the cause. It is also interpreted that it is dangerous to only pursue one party or individual and thereafter establish limits as big organizations' knowledge is conventionally very scattered between competences within the organization. It is also important to acknowledge that an organization consist of individuals with emotions and self interests that engage in politics for various reasons. Hence, the researchers recommend that in case of rejection for a proposal from one party, another one should be contacted in order to verify the legitimacy of the rejection due to possible deficiency in individual knowledge or interests.

The other champion that was not a part of the Thesis Project but part of the top management, was gained through presenting the Thesis Project's goals and potential in a meeting set up by a champion within the project team. Hence, convincing the top manager that the project should be supported and prioritized. Even though the top manager did not actively promote or sell the idea further, to mention the name and the show support from a top manager engaged and provided more interest when meeting various stakeholders. The realization process of the solutions was more efficient and decisive after the support from the top manager had been gathered. Furthermore, top managers became involved and interested as a result from the

efforts performed from the champion from the top management, which even further increased the process of realization. The solutions of the Thesis Project even became prioritized among all the change requests within the organization.

The researchers interpret that the bottom-up strategy created solid solutions and ideas, while the top-down strategy enhanced the realization process. The researcher also interpret that there may exist a connection between the two, where user-centered initiatives resulting in solid solutions facilitates and help obtain the support and realization initiatives from top management. Using only one of the strategies and direction (i.e. bottom-up and top-down) ought to prolong the actual development and realization. However, using the strategy the researchers used where solutions were developed from bottom-up and afterwards used as a persuasion tool to initiate top-down initiatives in order to obtain realization is argued by the researcher to be a highly effective strategy.

6.2. What values did the CUT methodology bring to the project?

In this section, the researchers discuss how the performed CUT methodology contributed to the end results and its solutions. The solutions regard both the IT platform and the overall process improvements on and between different process activities.

6.2.1 Developing the IT platform using Design Thinking and Agile Software Development

The IT platform was a highly important and central tool to accomplish several goals of the studied project. Hence, it is as important to emphasize the engagement of the platform developer right from the initiation of the project.

Our approach to acquire key users was by a cumulative causation-like procedure; users knew the processes better than us and would refer us to the next person in line to answer our questions. Naturally, new points of view and sources of information implied new ideas and requirements. During the whole studied project new insights would emerge on a regular basis. These would at times conflict with the existing understandings and specification or, at best, build upon current ones. In either case, they needed to be considered. while at the same time, the platform needed to be in developing motion. For the methodology chosen, we needed an evolving concept for the interaction with users.

As mentioned, one predisposition of utilizing user-centered methodologies was to deliver concepts early, to have input on physical models and mockups of the ideas. Just as Lean Startup methodology implies the importance to identify a minimum set of requirements needed to solve the problem for our targeted users (i.e. our earlyvangelists) so does ASD.

If we were to follow the traditional project management model, a specification would have been handed to the developer with all variables and functions explicitly stated. This could then only have been done after the project was finished and an arbitrary amount of data has

been collected. Although, this strategy would have left us with limited presentation material of concepts to key stakeholders, earlyvangelists and champions during the Thesis Project. As well as the fact that we would not have known if the requirements in the specification were viable technically; interaction with other systems, functionality, user friendliness etc.
The fact that the software developer was used to this type of methodology led to some challenges. Being given a specification sheet means that the developer is only responsible to develop the software/platform accordingly.

Therefore, one particular cornerstone of the ASD was essential to establish - self-organizing. We needed to be clear about why ASD methodology was crucial to adapt, yet taking in consideration the schedule of the developer. As a mutual understanding for the way of working for both parts was established, an effective progress could be noted. The simple fact that the researchers do not have coding experience implies unawareness of the most effective design for certain functions in the platform. Letting the responsibility of choosing the right design and tool for sustaining a particular function was then let over to the developer.

The initial discomfort of using ASD within a large organization with a developer whose schedule is packed with projects and deadlines was certainly a challenge to overcome. But, by pushing and establish the iterative and incremental cornerstones, and for taking on more responsibility early on, we could deliver great concepts to decision makers. These would in turn get better appreciation for the project and allow for more freed resources for the developer. Consequently, the developer would have more time and resources to self-organize and adapt Agile mindset. Finally, as the emergent cornerstone implies; it is about finding the right way of working. Being comfortable with structure and utilize competencies of the team members together with incremental progress will display results. As much as the product needs iteration towards a greater final product, so does the team. Identifying what structure, responsibilities and dynamics works best for the team and iterate towards an optimal working environment.

6.2.2 Creating and utilizing an MVP

Initially, as we did not have sufficient initial knowledge of the matters of interest, it was difficult to create a MVP (i.e. Minimum Valuable Product) to work from. Therefore, great efforts to gain essential knowledge manifested in meetings with users explaining and formulating the processes and activities. The other way around, before constructing the MVP, it was time consuming to explain the goal and overall plan of the project to the users. Hence, a lot of meetings were spent exploring and understanding matters from both ways, which is not often conventionally performed in the company. However, with the prerequisites we had the extensive meetings must be seen as a requirement. With this in mind, entrepreneurs need customer interaction to create their MVP, but they also construct their own startup culture and frameworks to relate to. Whereas in our case we needed to adapt to the environment and structure of a large organization.

So, to create a solid fundament to build the MVP upon, we needed to dig deep into the issue in question. The more people and departments that were involved in a certain activity or

interconnected issue created the need of even more meetings. This was due to that individual meetings with each department were needed in order to gain the required knowledge and understanding for the researchers, and for the simple reason that gathering a lot of employees to a meeting at a certain time is problematic due to schedule issues. We tried not to gather a lot of different employees from different departments if not necessary as their time is valuable for the company. Further, we argue that having long and extensive meetings where all information and discussions are not relevant to the majority of the participants create wastes of time which could be better used, and negative attitudes for future cooperation. Only when necessary employees were brought from different departments. This happened for example when the required knowledge was scattered among the departments, and a cooperative solution were needed. The researchers experienced and interpret that the more cross functional a solution or activity is; the more meetings are required due to the issues mentioned just above.

While acquiring the first MVP it implied that an iterative approach of the CUT methodology is adapted. Naturally, the continued meeting intensity was a fact, although it manifested in a highly efficient and constructive nature. As the meetings brought value and added quality to the solutions it is interpreted to be an acceptable trade off. All meeting efforts from the point of creating an MVP and on were solitarily utilized to develop the solution.

The pre- and post-MVP timeline discussed above is however more or less a necessity when performing the CUT methodology with the prerequisites the researchers has had in order to obtain the preferred results. With the conditions and prerequisites, it is interpreted to be creating a trade off between time and quality. In order to obtain good quality of the solutions using the CUT methodology, a lot of time, mostly meetings and brainstorming sessions have been performed. However, it is interpreted that high quality solutions have been developed, and also more importantly that conventional work methodology within the company would also have generated a lot of time spending and maybe even a prolonged overall process. However, the difference is that it is not usual that project members work full time with the project as the researchers have done.
The researchers interpret that it in order to use the CUT methodology with existing prerequisites and conditions within the company, its more or less necessary that there is at least one employee working full time dedicating all efforts to the project. As a lot of the information is scattered, there are a lot of meetings, small incremental developments, and very intensive project activities, it is interpreted that it is hard to achieve the desired results using a conventional project structure. Coordinating, gathering all information, and driving the development of the project is, interpreted by the researchers, needed to be performed by having at least one 100% dedicated project member in order to optimally obtain the best results.

6.2.3. How to minimize the risk for failure

By having a lot of information collected about the users needs and demands, we knew what essential functions to fulfill with our MVP. Although it is necessary to point out that the

MVP also have the job to convey the vision for the end result we wanted to achieve. We therefore made sure to clarify and share the insights we gained with the earlyvangelists, to create a unified vision to work against. And, therefore it is important to collectively acknowledge the actual underlying reason of why a function or procedure exists. Understanding why something is done, allows the group to iterate through multiple ways of how to achieve such end result. The different expertise within the earlyvangelist group also have knowledge preferences of the existing systems and processes. Consequently, we made sure that the iterations of the MVP passed all the involved earlyvangelists. The aim was to eliminate barriers and minimize efforts to transact to the new solutions, by utilizing users preferences and knowledge. Solutions would be approved or adopted by each iteration and essentially converge to an optimal form. A form that was accepted by all stakeholders, where barriers were eliminated for integration of current interacting systems and be in line with the overall vision of the project as well as the company.

6.3 Validation

This section presents a validation of the CUT methodology. The validation consists of two different aspects. Firstly, a comparison between the Thesis Project and with theory describing some success factors is discussed. Secondly, feedback and responses from users and managers within Volvo are elaborated. These two aspects form the validation of the CUT methodology due to the limitations, also discussed in subchapter 1.4.

6.3.1. Some success factors as a result of the CUT methodology

Moorhead and Griffin (1992) discuss five different key factors for successfully develop an organization or an improvement possibility. These key factors are; taking a holistic view, securing top management support, encouraging participation, fostering open communication, and rewarding contributors. These factors were discussed more in depth in chapter 2.2.

The researchers had to get a grasp of the overall process and its different activities and systems which were very broad and extensive. Gathering a detailed understanding of all parts of the process would have taken too much time and was seen as quite unnecessary as other employees involved in the Thesis Project possessed that knowledge. Their knowledge in combination with their years of experience and specific focus, and their willingness of cooperation made the need of in depth knowledge for the researchers excessive. Consequently, the researchers concentrated on the overall process, systems, and their interconnectedness which gave them a holistic view.

Securing top management support was a big part of the Thesis Project. Moorhead and Griffin (1992) mention that change initiatives often fail if the top management support is lacking. The project team had already at the initiation of the project set goals in order to gather support from various stakeholders within the company. As mentioned in chapter 5, the strategy used was bottom up where qualitative solutions and prototypes were created in order to have strong material that could help gaining the support of the management. The progress

of securing top management support was made continuously and partially during the Thesis Project.

Creating a sense of participation and a chance to influence the results is important in order to make people commit to efforts and goals (Moorhead and Griffin, 1992). The CUT methodology that the researchers have used, and more specifically, Design Thinking has participation of users and different competences as one of its major cornerstone. Further, as the development were focused on being performed bottom up, the participants had a very big influence in the development and its results.

Furthermore, open communication was also obtained in a similar way as described just above, where all involved had their say and opportunity to be influential of the results. The way of working with the users and others involved is interpreted by the researchers to create a flat organization without any clear hierarchy which consequently foster open communication.

Lastly, by giving all the involved a chance to contribute and offering solutions which are beneficial to their work activities, the development of the Thesis Project did naturally reward the contributors by making their work easier and more effective. Moorhead and Griffin (1992) mention that failing to reward contributors can condemn the future of the change as word of mouth travel quickly. However, the researchers interpret that the opposite is valid as well, where satisfied and rewarded contributors will spread a good reputation among other employees. Consequently, involving new employees proved to be rather easy as many of them had heard positive things of the Thesis Project and were interested in contributing themselves.

The researchers did not take these factors in account during the actual Thesis Project, but has rather been the results and consequences of using the CUT methodology created by the researchers. The researchers interpret that by having these factors fulfilled by simply using the CUT methodology is a valid and important argument that it can act as a successful tool in these type of projects.

6.3.2. Feedback and responses

Although feedback and responses from users and managers does not represent the highest quality of validation methods, it is due to the limitations and circumstances of this thesis a valid and relevant measure that should be considered.

The employees within Volvo that we received feedback and responses from can be categorized into two different groups; the users and the managers. The users represent, as described earlier, the actual first-hand users of systems and processes concerning the studied process, while managers are so-called decision makers that mainly contribute to the realization of the improvements.

The users have at the later stages of the Thesis Project formally expressed their approval and positive thoughts to their superiors, and also directly to the researchers, which is interpreted to be a positive validation. The devotion, willingness to consume time, and engagement to being part of the solutions by the users is interpreted to show that the vision of the project, and the CUT methodology was appreciated by the users. As the users were continuously involved, and also showed little resistance to participate but rather appreciated it is interpreted to validate that the actual CUT methodology can be utilized within a big organization in regard to the users. However, the users' appreciation does not validate the actual results of the Thesis Project. Drawing conclusions of the results based on the users' feedback and responses can be considered as biased as the users have been highly involved and also influenced the end results of the solutions. The results and solutions of the Thesis Project using the CUT methodology should be validated by a more neutral part with a broader perspective that can assure the solution's viability within the organization.

Hence, it is the feedback and responses from managers (i.e. decision makers) that can measure the viability in regard to the results of the Thesis Project as they possess the requirements described just above. The feedback and responses from the managers have been very positive in different ways. Firstly, in both formal and informal oral statements directly to us and also between their colleagues and other important stakeholder. The researchers received very positive feedback and appreciation from various managers at the final presentation but also continuously during the Thesis Project. The researchers also experienced that many managers, not involved during the project, expressed their interest and how they had gained knowledge of the Thesis Project by word of mouth circulating within the organization. Secondly, the actual realization progress is interpreted to show the success and acceptance of the solutions and results. In a relative short time (approximately four months) the project team took an idea to a formal implementation decision with detailed solutions and also a fully functional, but not complete, IT platform. The different levels of hierarchies where the implementation decision were needed to be discussed progressed very fast without any major hindrances, and was very well embraced and accepted by the decision makers. This is interpreted to represent a positive validation.

6.4. Implications of implementing the CUT methodology within large firms

This section discusses some implications for utilizing the CUT methodology within large firms in general, and more specifically, within Volvo Trucks. A suggestion for a possible implementation of the CUT methodology is also presented.

6.4.1. Large organizations do not allow for the flexibility required from this type of project management

Supporting systems for project management at the hosting firm are seemingly rigid. So are the work schedules of the employees. Usually employees have several projects they are working on in parallel, and certain allocated time for each of them. These fill up the daily

schedule for the employees, with fixed routines and leaves little room for involving in unplanned engagements.

The method we used to acknowledge employees, by cumulative causation approach, means that it was never known who the next employee of interest was. And, when the interaction was found valuable for the project the employee would desirably be involved. Although, these freshly acquired resources (i.e. users) did not have time to allocate for this particular project. Their managers, who distributes their projects and allocates time frames, needed to be informed and convinced to prioritize. Although, they need the official project description document for reference, which involved yet another set of managers. Consequently, the progression of the project implied a few acquisition of users, their managers and so on. One could quickly draw the conclusion that lack of flexibility in this case was a fact.

To deal with this issue the researchers needed to make everyone aware of the methodology used. Even more importantly, the researcher avoided involvement of any bureaucratic in the extent possible. Instead emphasis was put on establishing the problem areas and lifting solid solution from users. The users tended to strongly support their own solutions and anchor them among others in the project group.

6.4.2. Collateral organization

As mentioned in the previous chapter section above, working accordingly to the CUT methodology and structure is not optimal for the specific organizational structure at Volvo Trucks or similar big organizations. In a similar way as Murthy (2007) discuss, the main organization could have issues solving problems due to constraints of organizational structures, rules, and regulations. A possible strategy to overcome these challenges is according to Murthy (2007) to create a so-called collateral organization. Collateral organizations is created to exist alongside the main organization in order to facilitate the problem solving by creating better conditions to work and cut across formal organizational boundaries.

The researchers draw the conclusion that they have worked in a similar way by being an independent group not clearly belonging to any specific department which has worked cross functionally and tried to overcome formal regulations and processes. Based on the results, efficiency of the solution development, and the reception of both users and managers, the researchers interpret that the CUT methodology has been successful. The Thesis Project show that a collateral organization is possible within Volvo Trucks. The researchers therefore recommend that Volvo Trucks could create a collateral organization with the aim to drive improvements from the bottom up perspective. This would allow the possibility to capture and realize innovations and process improvements from the user perspective, a perspective that is often more or less neglected within big organizations.

The collateral organization could exist of different project leaders which would be contacted by users and employees with innovative ideas that are too extensive to run for themselves.

The project leaders would then work in a similar way as the researchers with the aim to realize as many of the viable and important improvements as possible in order to bring value to the overall organization.

7. Conclusion

This thesis has explored the usability of user-centered methodologies for driving a change initiative within a large firm that conventionally does not utilize such methodologies. In this thesis we have shown how the CUT methodology first-handedly engages users that are affected by the processes in question. By involving earlyvangelists and key stakeholders into the iteration of the MVP, reasons for individuals' resistance were proactively reduced right from the start. Rather than pushing change onto the organization, CUT methodology pulls knowledge from users and adapts to the circumstances. This creates a sense of participation along the chain of users and sets the stage for a smooth transition into new, effective ways of working.

In contrast to the example of “boo.com”, a startup that became a huge success is “Zalando”. Since its launch in 2008 the company has managed to become the largest online apparel retailer in Europe. Their success comes from acknowledging the hugely fragmented market of Europe, and by embracing that knowledge to use it in their favor. They explored how customers in the different markets behave while shopping online and adapted their service and online experience to each market, based on their insights.

In that same sense we hold a conviction that change initiatives must meet the current employees needs and demands, while considering established behaviors and beliefs. Technically complete and seemingly great solutions might deviate from these values and hinder productivity, ultimately leading to rejection. Major misalignments with existing IT systems within the firm will slow the process of change down, and could cool off the interest for the initiative.
By aligning the change initiative along the company vision and utilizing champions to confirm its importance enabled top management involvement. The support from users was a reinforcing factor implying the necessity of change. The realization of the solutions has been accomplished more effectively by considering both bottom-up and top-down interest simultaneously, while iterating and developing towards a common denominator.

The user-centered approach enabled the researchers to manage the project closely to its users and in line with company vision, keeping all parts of the organization constantly engaged. With consideration of all needs and constant iteration, elements of surprise were eliminated. The final solution aligned all parties and their needs, maximized their gains while keeping the implementation barriers low for IT and user adaption. In a stage of transition users will already be comfortable with the solution and familiar with the changed circumstances it implies.

If this methodology will enable more firms to reduce the current fail rate of 70% for change initiatives, much resources in time and funds can be saved, while gaining grounds in the competitive landscape.

8. References

Attong, M., Metz, T., Books24x7 (e-book collection) & Books24x7, I. 2013;2012;, Change or die: the business process improvement manual, 1st edn, CRC Press, Boca Raton, FL.

Blank, S. (2006). *The Four Steps To The Epiphany, Successful Strategies For Products That Win*. 2nd ed. Cafepress.com.

Blank, S. (2013). *Why the Lean Start-Up Changes Everything*. [online] Harvard Business Review. Available at: https://hbr.org/2013/05/why-the-lean-start-up-changes-everything [Accessed 2 Oct. 2015].

Brown, T. 2009, Change by design: how Design Thinking transforms organizations and inspires innovation, 1.th edn, Harper Business, New York.

Bryman, A. and Bell, E. (2011). Business Research Methods. 1st ed. Cambridge: Oxford University press.

Buchanan, R. (1992). Wicked Problems in Design Thinking. *Design Issues*, 8(2), p.5-21.

Burgelman, R.A., Grove, A.W., 2007. Let Chaos Reign, Then Rein In Chaos - Repeatedly: Managing Strategic Dynamics For Corporate Longevity. Strategic Management Journal 28, 965-979

Butler, D. and Tischler, L. (2015). *The Startup Revolution Is About To Surge Again*. [online] Fast Company. Available at: http://www.fastcompany.com/3039882/the-startup-revolution-is-about-to-surge-again [Accessed 2 Oct. 2015].

Carpinetti, L.C.R., Gerólamo, M.C. & Dorta, M. 2000, "A conceptual framework for deployment of strategy-related continuous improvements", The TQM Magazine, vol. 12, no. 5, pp. 340-349.

Cohen, R. (2014). Forbes Tech. [online] Forbes.com. Available at: http://www.forbes.com/sites/reuvencohen/2014/03/31/design-thinking-a-unified-framework-for-innovation/ [Accessed 18 Aug. 2015].

d.school, (2015). Welcome to the Virtual Crash Course in Design Thinking. [online] Available at: http://dschool.stanford.edu/dgift/ [Accessed 4 Nov. 2015].

Davenport, T. (1993). Process Innovation: Reengineering work through information technology. *Harvard Business School Press, Boston*.

Denscombe, M. 2014, The Good Research Guide: For Small-Scale Social Research Projects, Fifth edition. edn, Open University Press, GB.
Gavin, D. (1998). The Processes of Organization and Management. *MIT Sloan Management Review*.

Designthinkingforeducators.com, (2015). Design Thinking for Educators. [online] Available at: http://www.designthinkingforeducators.com/ [Accessed 4 Nov. 2015].

Geier, B. (2015). *What Did We Learn From the Dotcom Stock Bubble of 2000?*. [online] TIME.com. Available at: http://time.com/3741681/2000-dotcom-stock-bust/ [Accessed 2 Oct. 2015].

Gobetto, M. & SpringerLink (e-book collection) 2013;2014;, Operations management in automotive industries: from industrial strategies to production resources management, through the industrialization process and supply chain to pursue value creation, 1;2014; edn, Springer Science, Dordrecht.

Johnson, A. (2008). A short guide to action research. Boston: Pearson/Allyn and Bacon.

Kim, Y., Sting, F. & Loch, C. 2014, "Top-down, bottom-up, or both? Toward an integrative perspective on operations strategy formation", JOURNAL OF OPERATIONS MANAGEMENT, vol. 32, no. 7-8, pp. 462-474.

King, James B. (Business writer), King, F.G., Davis, M.W.R. & Ebrary (e-book collection) 2014, Process improvement simplified: a how-to book for success in any organization, ASQ Quality Press, Milwaukee Wisconsin.

Lohr, S. (2010). Lean Start-Ups Aim to Find Customers Quickly. [online] Nytimes.com. Available at: http://www.nytimes.com/2010/04/25/business/25unboxed.html?_r=0 [Accessed 16 Aug. 2015].

Markham, S.K., Green, S.G. & Basu, R. 1991, "Champions and antagonists: Relationships with r&d project characteristics and management", Journal of Engineering and Technology Management, vol. 8, no. 3, pp. 217-242.

Mintzberg, H., Waters, J.A., 1985. Of Strategies, Deliberate and Emergent. Strategic Management Journal 6, 257-272

Moorhead, G. and Griffin, R. (1992). Organizational behavior. Boston: Houghton Mifflin.

Murthy, C.S.V. 2007, Change Management, Global Media.

Nohria, N. and Beer, M. (2000). *Cracking the Code of Change*. [online] Harvard Business Review. Available at: https://hbr.org/2000/05/cracking-the-code-of-change/ar/1 [Accessed 2 Oct. 2015].

Ries, E. (2011). The Lean Startup. New York: Crown Business.

Smith, J.J., McKeon, J.E., Hoy, K.L., Boyson, R.L., Shechter, L., and Roberts, E.B., 1984. Les-sons from 10 case studies in innovation - I. Res. Manage., (September-October): 23-27.

Stamelos, I.G., Sfetsos, P., Books24x7 (e-book collection) & Knovel (e-book collection) 2007, Agile Software Development quality assurance, Information Science Reference, Hershey, PA.

Twitter, (2015). Jussi Pasanen on Twitter. [online] Available at: https://twitter.com/jopas/status/515301088660959233 [Accessed 4 Nov. 2015].

Wray, R. (2005). *Boo.com spent fast and died young but its legacy shaped internet retailing*. [online] the Guardian. Available at: http://www.theguardian.com/technology/2005/may/16/media.business [Accessed 2 Oct. 2015].