LEAN AND AGILE PHILOSOPHIIES AND WORK-METHODS IN THE SWEDISH TEXTILE SECTOR – A PILOT STUDY

Master thesis in Applied Textile Management

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Preface

Our vision with this thesis has been to create an understanding and identify the dispersion between lean and agile philosophies and methods of working within the Swedish textile industry. Moreover, since this thesis is a pilot study, conducted, tested and given suggestions for improvement regarding a survey that can be used in future research on this subject.

This thesis has been written at the Swedish School of Textiles, at Borås University during the spring semester 2013.

We would like to thank our supervisor Peter Manfredsson for his support and inspiration while conducting this thesis. Your guidance has been much appreciated to us. We would also like to thank the three participating companies who have answered our survey, without them this thesis would not have been possible to carry out. We would finally like to thank each other for a fun and giving cooperation.

Thank you!

University of Borås, July 2013

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**Abstract**

Lean Production is a well-established concept that has been most prominent within the car manufacturing industry. It bases on the idea to remove all waste and to strip away unnecessary steps that do not add value to the customer. Agile, on the other hand, is a flexible concept, aimed to stay put during volatile circumstances.

This thesis deals with the phenomena of Lean Enterprise, which is an elongation of Lean Production. Now the whole organization, on all levels, is included. The thesis also explores the concept of agile, as in agile development and not in a software focus. The purpose of this study is to identify the dispersion between lean and agile philosophies and methods of working within the Swedish textile industry. No previous research about this subject have been made, solely on Lean Production, both in the textile sector and others, or Lean Enterprise, but then not within the chosen sector. Moreover, have no study been made regarding the Swedish textile sector.

In order to pursue this study the authors had to explain what characteristics that are describing the phenomena of Lean Production, Pettersens (2009) research was chosen to display these. Then, these groups of characteristics were transmitted into a suitable Lean Enterprise way of thinking, to lift lean up from solely producing environments.

By using this information a quantitative survey with 33 assertions have been assembled and executed on three different companies with a total of 16 respondents. The conclusions that can be drawn from this study are that there are indications that lean do exist on an operative level, throughout whole organizations, with the most prominent group of characteristics being scientific management. The least implemented group of lean characteristics within the participated companies is defects control. The results also did indicate that agile characteristics do exist but however in various amounts and in various parts.

This thesis is a pilot study which will be used as the fundament for an upcoming study, therefore the latter part of this thesis’s purpose was to conduct, test and give suggestions for improving a survey.

**Keywords:** Lean, Lean Enterprise, Agile, Textile sector
Table of Contents

1. Introduction ................................................................................................................................. 1
   1.1. The phenomena of lean ......................................................................................................... 1
   1.2. The concept and evolution of Lean Production ................................................................. 1
   1.3. Contestant or companion – Agile ..................................................................................... 3
   1.4. Problem description ............................................................................................................ 3
   1.5. Purpose ............................................................................................................................... 4
   1.6. Research questions ............................................................................................................ 4
   1.7. Delimitations ....................................................................................................................... 4
   1.8. Disposition .......................................................................................................................... 5
2. Theoretical frame of references ............................................................................................... 6
   2.1. Lean ..................................................................................................................................... 6
       2.1.1. Just in time practices ..................................................................................................... 7
       2.1.2. Resource reduction ...................................................................................................... 7
       2.1.3. Human relations management ..................................................................................... 8
       2.1.4. Improvement strategies ............................................................................................... 9
       2.1.5. Defects control ........................................................................................................... 9
       2.1.6. Supply chain management .......................................................................................... 10
       2.1.7. Standardization .......................................................................................................... 10
       2.1.8. Scientific management ............................................................................................... 11
       2.1.9. Bundled techniques ................................................................................................. 11
   2.2. Theoretical discussion – The Lean Enterprise ................................................................. 12
       2.2.1. Formulation of hypotheses ....................................................................................... 14
   2.3. Agile .................................................................................................................................... 15
       2.3.1. Agile Implementations ............................................................................................... 16
   2.4. Pilot studies ........................................................................................................................ 16
   2.5. Survey ................................................................................................................................. 16

3. Method ....................................................................................................................................... 19
   3.1. Quantitative method of choice ......................................................................................... 19
   3.2. Sample ............................................................................................................................... 19
   3.3. Literature search .............................................................................................................. 20
   3.4. Implementation of study .................................................................................................. 20
   3.5. Survey appearance .......................................................................................................... 21
   3.6. Pre Study .......................................................................................................................... 25
3.7. Implementation of survey ................................................................. 26
3.8. Summary of survey ........................................................................... 26
3.9. Presentation of data ........................................................................... 26
3.10. Reliability .......................................................................................... 27
3.11. Validity ............................................................................................... 27

4. Results .................................................................................................... 28
  4.1. Just in time practices .......................................................................... 28
  4.2. Resource reduction ............................................................................ 29
  4.3. Human relations management ............................................................ 29
  4.4. Improvement strategies ...................................................................... 30
  4.5. Defects control .................................................................................. 30
  4.6. Supply chain management .................................................................. 31
  4.7. Standardization .................................................................................. 31
  4.8. Scientific management ....................................................................... 32
  4.9. Bundled techniques ............................................................................ 32
  4.10. Agile .................................................................................................. 33
  4.11. Comments per assertion .................................................................... 33

5. Analysis ................................................................................................... 34
  5.1. Analysis of survey results ................................................................... 34
    5.1.1. Test of hypotheses ......................................................................... 36
  5.2. Analysis of the survey formation ....................................................... 36
    5.2.1. Suggestions for survey improvements .......................................... 37

6. Conclusions ............................................................................................ 39
  6.1. Reflections .......................................................................................... 39
  6.2. Future research ................................................................................... 40

7. References .............................................................................................. 41

Model 1. The Lean Enterprise
Table 1. Characteristics of lean
Table 2. Survey assertions background
Table 3. Survey assertion and theoretical connection
Appendix 1. Original Survey in Swedish
1. Introduction

This introducing chapter gives the reader a background to the chosen topic, with the emphasis on the concept of lean philosophies and ways of working, and with a small focus on agile. The concept and evolution of Lean Production will be presented, along with a model displaying the ultimate goal – Lean Enterprise. Agility will then be presented in short, and then the thesis’s problem description. The chapter ends with the thesis’s research questions, purpose, delimitations and a chapter disposition.

1.1. The phenomena of lean

Doing good with less resources – less human effort, less equipment, less space and less time is how some define the phenomena of lean (Womack et al. 1990; Bicheno & Holweg, 2009), a philosophy that has taken the globe by storm during the last centuries (Dibia & Onuh, 2010). To obtain high performances i.e. high production is something that have been strived after during modern history, with its groundwork in Taylorism and then later Fordism (Flincebaugh & Tracey, 2006), which is where the concept of lean, however not enunciated, started to evolve.

Nowadays, organizations that have implemented lean have stated to experience a 63% reduction in the customer lead-time, an increase in market share by 61%, an increase by 24% in product diversity and a time reduction when launching new product by 39% (Standard and Davis, 1999). This phenomenon does indeed seem like a way of continuous improvement methods that function.

1.2. The concept and evolution of Lean Production

The phrase Lean Production got spread through the book The Machine That Changed the World (Womack et. al., 1990), based upon Toyotas way of stripped production and Ohnos (1988) article where the phrase first was coined some years before. Womack and Jones (1994) describes that companies can develop, produce and distribute products much more efficiently through eliminating all excess waste, aligning all activities, creating cross-functional ways of team working and to constantly strive for improvement. With this book as a starting point, much research have been made regarding what parameters that actually define and are included in the concept of Lean Production (Karlsson & Åhlström, 1996; Bhasin & Burcher, 2006; Forrester & Soriano-Meier, 2002).

The book The Machine That Changed the World stresses the fact that it is not separate working units that define the concept, rather the holistic view of all activities that are included in the production of goods, ranging from product development, manufacturing and distribution. When seeking to implement Lean Production, factors of relevance are the actions taken, the principles that are applied and the overall chances that are made in order to contribute to an organizations desired state of performance (Karlsson & Åhlström, 1996).
Pettersen (2009) investigated how different articles defined the concept of Lean Production, what should be included and which activities that should take place. However, the conclusion consists of the analysis that no concrete definition exists among researchers but that an agreement can be found on the characteristics that defines the concept. As a result of these difficulties of defining the concept, problems of how to admeasure its effects also occur. Hence, researchers must specify what parts of the concept that are being measured, in order to relate it to the concept of Lean Production and thus what effects are collected (Parker, 2003). Hines et al. (2004) does moreover state that the whole definition and concept of Lean Production is liquid, constantly evolving and hence only will be a “still image of a moving target, only being valid in a certain point in time”. Furthermore Pettersen (2009) questions whether a concrete definition is useful at all, since management concepts have a tendency to strive for continuous improvement and movement.

Hodge et al (2011) implies that the most commonly used and important parts of Lean Production is customer satisfaction, just in time, standardized work, continuous improvement, visual management, policy deployment and value stream mapping. The latter one must be implied through the whole organization.

In order to obtain Lean Production, Karlsson and Åhlström (1996) have developed a model in which the way towards the ultimate goal, Lean Enterprise, is presented.

![Model 1: The Lean Enterprise (Karlsson & Åhlström, 1996)](image)

As the model describes, Lean Production implies a holistic view where the whole organization is included. As Bhasin and Burcher (2006) discusses it is suggested that a company does not practice one or two of the above tools, but rather all of them in order to gain greater success from the concept. Moreover, many organizations look upon lean as a process and isolated way of producing goods, whereas they rather should view it as a whole philosophy. When the latter one is implied, tactics and processes become mechanisms which work towards an actualization of the philosophies and thoughts (Bhasin & Burcher, 2006).
1.3. Contestant or companion – Agile

Agility, characterized by movement and flexibility is a philosophy that runs on volatile and uncertain circumstances that can be chosen instead of, or together with Lean Production, or Lean Enterprises, for that matter. Agile ways of working can contribute while implementing or running more lean ways of manufacturing or working on an organizational level (Abramhamsson et. al. 2010).

1.4. Problem description

As discussed above Lean Production is a well-established concept, that does, and has hitherto, been most commonly used within production environments, especially within the car manufacturing industry. Moreover does lean, as in Lean Enterprise, include the methods of working and philosophies within the organizational, administrative level, such as functions of economics, human resources, logistics, sales and marketing and others inside a company, hence not solely the actual producing flank. Furthermore this concept is much poorly researched within the textile industry, and likewise within the textile industry, or sector, in Sweden. A recent study conducted in a producing environment in a textile company in America have been made, however did it focus on, the traditional, producing flank and not the office-worker environments (Hodge et. al. 2011).

How widespread is lean thinking within Swedish textile companies on an organizational level today? Do companies have any philosophies that concur with lean, Lean Enterprise, or perhaps agile or leagal, a mix of the two? How does literature define lean and agile, and how, if at all, can these philosophies be transformed into suiting a more organizational level of companies?

This thesis consists of a pilot study that is supposed to work as a fundament to a greater research project; hence the material obtained in this paper will lay the ground for a further and more throughout investigation regarding this matter.
1.5. Purpose
The purpose of this thesis is to identify the dispersion between lean and agile philosophies and methods of working within the Swedish textile industry. Since this thesis is a pilot study, the purpose will also entail to conduct, test and give suggestions for improving a survey that can be used in an upcoming research.

1.6. Research questions
In order to be able to answer the thesis purpose these research questions must be replied:

-How does literature define lean?
-How does literature define agile?
-Which characteristics are the most prominent within lean and agile?
-How can Lean Production be converted into methods suited for lean management on an organizational level?

Note that these research questions will be answered in the theoretical frame of reference chapter. The first three research questions will be discussed in the chapter Lean and Agile, while the fourth question will be answered within the theoretical discussion chapter. The finding on the research questions, answered within the theoretical chapter, will lay the ground for the assertions constructed within the survey.

1.7. Delimitations
The authors of this thesis have had a limited time frame to work on this paper which has resulted in this study should be viewed as a pilot study and not a full scale research where the results can be generalized on the whole Swedish textile sector.

Since this study is based on the Swedish textile sector the research will only be on Swedish companies and no companies outside of Sweden or in other sectors.

Since this thesis is a pilot study have is the focus where the forthcoming research will lie; on lean. Therefore lean will have a much larger part within the whole study than agile.
1.8. Disposition

Chapter 1
In chapter one an introduction of this thesis is being presented, including the phenomena of lean, the concept and evolution of lean production, a short description of agile and a problem description, the purpose of the study, research questions and delimitations and a disposition.

Chapter 2
Chapter two consists of a theoretical framework including an in depth presentation of what parts are included in lean as well as a theoretical discussion on lean enterprise and formulation of two hypotheses. The chapter also includes a brief presentation of agile and how it is being implemented as well as theory on pilot studies and how to construct a survey.

Chapter 3
In chapter three the methodical framework are being presented that has been used including choice of method, standpoints regarding validity and reliability and operationalisation and a brief summary of the study.

Chapter 4
Chapter four consists of the results of the study, presented in form of charts and text.

Chapter 5
In chapter five a analysis are being presented of the survey results as well as a test of the hypotheses. The chapter also includes an analysis of the survey formation and suggestions for improvements of the survey.

Chapter 6
Chapter six contains the conclusions that the authors draws from the study as well as their reflections and suggestions on future research.

Chapter 7
Chapter seven includes all sources that have been used in this thesis.

After the final chapter the original survey that has been used in this study is being appended.
2. Theoretical frame of references

This chapter provides the reader a ground for this thesis, first will the concept of lean be addressed with basis on Pettersens (2009) article, and here is where the thesis focus will lie. Thereafter the reader will be given a bridge between the Lean Production theories towards an implementation on the latter one towards an organizational culture. Later the concept of agile will be presented in short. The last part of this chapter will be a discussion about pilot studies and survey-making. Note that this chapter will provide answers for the research questions.

2.1. Lean

Pettersen (2009) have conducted a research regarding which areas that defines lean, where the researcher analyzed which characteristics that were the most common in the literature, up until the year of 2009. These characteristics where then put into a table, which this thesis theoretical framework will be based upon. The table consists of nine main groups that include several characteristics, which will be throughout discussed.

<table>
<thead>
<tr>
<th>Collective term</th>
<th>Specific characteristics</th>
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<tbody>
<tr>
<td>Just in time practices</td>
<td>Production leveling (heijunka)</td>
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<td>Pull system (kanban)</td>
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<td>Takted production</td>
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<td>Process synchronization</td>
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<td>Resource reduction</td>
<td>Small lot production</td>
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<td>Waste elimination</td>
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<td>Lead time reduction</td>
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<td>Inventory reduction</td>
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<td>Team organization</td>
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<td>Improvement strategies</td>
<td>Improvement circles</td>
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<td>Continuous improvement (kaizen)</td>
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<td>Root cause analysis (5 why)</td>
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<td>Defects control</td>
<td>Autonomation (jidoka)</td>
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<td>Failure prevention (poka yoke)</td>
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<td>100% inspection</td>
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<td>Line stop (andon)</td>
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<td>Value stream mapping/ flowcharting</td>
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<td>Supplier involvement</td>
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<td>Cellular manufacturing</td>
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<td>Bundles techniques</td>
<td>Statistical quality control (SQC)</td>
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<td>TPM/preventive maintenance</td>
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Table 1. Characteristics of lean, Pettersen (2009), with own alterations
2.1.1. Just in time practices

Just in time practices is the first group, which includes production leveling (heijunka), pull system (kanban), takted production and process synchronization (Pettersen, 2009). All articles and books analyzed used these tools as indicators of Lean Production, hence are these vital instruments. Karlsson and Åhlström (1996) states that the basic meaning of just in time practices are that every process should be given the right part, in the exact right quantity, in the exact right point in time. Furthermore, the previous authors state that the ultimate goal in just in time practices is that solely one part is provided in the process at the precise time it is needed. Heijunka, which is Japanese and means leveling, is a critical part of Lean Production. Heijunka can refer to either production leveling by its volume or by its type, however the goal of production leveling is to produce the right amount and types that is required, hence demanded by the customers, to achieve stability (Jones, 2006).

Kanban, another Japanese word, is a method used in pull systems that indicates a need of material or resources within the production line. This can be done through that the workers send a kanban, which can be a card or such, to the previous station in the workflow to indicate the arisen need. Kanban can be seen as the opposite of a centrally controlled production flow (Romeo & Esparrago, 1988). The pull system is based upon the demand chain management rather than the supply chain management, since the pull system works in order to prevent goods in stock, the customer must first give a demand for the goods to be produced. The goods will stay in its origin form until it is needed in an altered form downstream (Andersson, Eriksson and Torstensson, 2006). To give weight to the customer pull rather than push from the organization, preferably through a kanban system, is one of the major definable of lean thinking (Womack et al., 1990; Womack & Jones, 1996).

2.1.2. Resource reduction

The second group in Pettersens (2009) table is resource reduction, which includes small lot production, waste elimination, setup time reduction, lead time reduction and inventory reduction. All of the above mentioned characteristics were included in all of the articles that Pettersen (2009) analyzed, which indicated that these parameters are of utmost importance as well as the previous group of characteristics. Karlsson and Åhlström (1996) states that waste can be viewed as everything that does not add any value to the product, hence the end customer, which the customer therefor is not willing to pay for and should be completely eliminated.

Lot seizes is valuable since it decides how long time the machines are running between set ups, moreover, small lot seizes increases flexibility which can be helpful in order to satisfy customer demand and to reduce inventory seizes (Karlsson & Åhlström, 1996). When producing smaller lot seizes the die time when setting up the machines needs to be at a minimum, since this can be viewed as a large waste time (Sanchez & Perez, 2001). The reduction of lead times between work in progress and lead times in transportation in the supply chain does not add any value and should be kept at a minimum. These can include transportation of parts, which is adhered to the number of times a good is transported, the total
physical distance that a good is transported. It can also include the transportation of scrap and rework, in relation to these parameters and the value in sales (Karlsson & Åhlström, 1996).

Sanchez and Perez (2001) state that inventories are a main source of inefficiency in companies within the industrial sector, that storage rarely adds any value to the product and therefore should be eliminated at all times. Karlsson and Åhlström (1996) agree to the previous authors and states that apart from being wasteful, keeping products in inventories can hide problems. However, one should not reduce inventories completely, especially not before the root of the inventories existence is removed, which can be done through reducing the down time in machines and through preventive maintenance (Karlsson & Åhlström, 1996).

2.1.3. Human relations management

Human relations management is the third set of characteristics in Pettersens (2009) table, which includes team organization, cross training and employee involvement. The characteristics in this group are not discussed in all articles analyzed by Pettersen (2009) and are therefore not vital or definable, but important to the concept of lean. All of the above characteristics, team organization, cross training and employee involvement, provides facilitation in the rotation of tasks and flexibility in the production levels, since a worker can accomplish not only one but several different tasks. It can also help solve problems occurring since employees with different backgrounds and inputs work closely together (Velaction, 2013).

When creating multifunctional teams, a possible resistance from workers regarding an increased number of tasks might appear, however this resistance can decrease when employees feel comfortable within the new multifunctional team (Sanchez & Perez, 2001). Lean does from an organizational point of view imply continuous improvements and therefore also continuous change, employees might feel that the circumstances are too turbulent, hence therefore must be applied properly (WTGnews, 2010). Employee involvement is based upon the thoughts that the employees do know the job he or she is doing best, and can therefore contribute with ideas and suggestions for improvements. When an employee is involved in such work, the previous discussed resistance towards change will lower (FourPrinciples, 2013). Team organization creates a high performance environment since every team is responsible for running their own part of the organization, therefore a higher degree of involvement and willingness to uphold the organizations vision might occur (Miller, 2005).

Cross training, to train employees doing many tasks, hence many different jobs within the organization, provides a large flexibility. Now, employees can be shifted between tasks in order to sort out the workflow during vacations, illnesses and needs and demands from the market and customer. It also gives the employees less boredom when solely conducting one task, which levels the job satisfaction (Velaction, 2013). Womack and Jones (1994) states that a function within a company is not only an organization handling a specific task, but also a
platform where learning is collected amongst its individuals, providing each employee greater knowledge which will increase the overall knowledge and skill of the team.

2.1.4. Improvement strategies
The fourth group of characteristics in Pettersens (2009) table, which all analyzed articles discussed, is improvement strategies, which includes improvement circles, continuous improvement (kaizen) and root cause analysis (5 why). Sanchez and Perez (2001) states that the process of continuous improvement must involve employees as well as top management and that improvement teams, such as improvement circles, is a must. Activities connected to improvement circles are improvement suggestion schemes, and to later follow up how these improvements are embracing the organization. This can be done through a traditional suggestion box where employees can leave their own suggestions, which later can lead to employees being rewarded, such as number of suggestions per year (Karlsson & Åhlström, 1996). The traditional suggestion box is however not viewed as a good alternative nowadays, since it is not fostering improvement strategies in a proper manner. Meeting addressed to discuss continuous improvement are instead getting more important, since teams now together can brainstorm and discuss new ideas for improvements (Modig, 2011).

Moreover, Hirano (1990) imply that a factory working in line with lean production strategies will have less quality control employees, since the factory workers themselves will have the ability to check for defects along the line, and might also be empowered to stop the production line to hindrance defect parts moving to the next step. The concept of kaizen denotes small continuous changes, in contrast to large radical ones. These changes include not only the actual organization but also tier one and two suppliers (Karlsson & Åhlström, 1996). The root cause analysis describes a problem solving strategy that sees to the actual cause of a problem rising, and then seeking to eliminate it from occurring again, rather than only solving a problem in a short time basis (Andersen & Fagerhaug, 2006).

2.1.5. Defects control
Defects control is the fifth group of characteristics in Pettersens (2009) table presented above, which was discussed in all articles analyzed. Defects control includes autononation (jidoka), failure prevention (poka yoke), 100% inspection and line stop (andon). This set of characteristics is based upon the thought of having fault free products from the start, hence this goes hand in hand with the previous set of ideas, improvement strategies. The main strategy of defects control is to discover small errors or faults that could lead to defects, to obtain a higher degree of control of processes. The first three characteristics, autonomation (jidoka), failure prevention (poka yoke) and 100% inspection are ways of conduction inspection of all components in order to make sure that there are no defects. This is made by the machine, which makes it very cost effective and gives the worker the freedom to combine different tasks. Line stop (andon), which is the fourth characteristic, consists of the power of employees to stop the production line when seeing a defect good, as discussed in the previous chapter (Karlsson & Åhlström, 1996).
2.1.6. Supply chain management

The sixth group of characteristics in Pettersens (2009) article is supply chain management, which only 78% of the entire analyzed article discussed. Included in this group are value stream mapping/flowcharting and supplier involvement. Value stream mapping is a way to overview, analyze and design the production flow from idea to finished goods in the hand of the consumer. It can also be implemented in organizations to identify how information and processes travel between teams and employees (Modig, 2011). In this way, processes or information that is non-value adding can be identified and eliminated (Maginer, 2003).

Closely connected to this concept is supplier involvement, since lead times is a large part of both supply chain management and value stream mapping. One ultimate goal of lean is to shorten lead-times and reduce waste, as previously discussed, which might be obtained through close relationships with suppliers (Karlsson & Åhlström, 1996). The relationship between the supplier and manufacturer can be situated in different levels depending on the degree of relationship needed. Simchi et. al. (2000) discusses four different levels; none, White box, Gray box and Black box. None relationship refers to the supplier solely dispatching what is wanted without any further notice, White box relationships refers to a degree of integration where the supplier is given information about design and specifications. The third supplier involvement, Gray box, represent a more throughout relationship where joint developments between supplier and manufacturer can occur and where collaborative teams are formed. The highest degree of integration, Black box, occurs when the supplier is given requirements and independently develops and designs material in order to suit the manufacturer, the degree of thrust in this degree of involvement is very high (Simchi et. al, 2000).

2.1.7. Standardization

Standardization is the seventh group of characteristics in Pettersens (2009) table pictured above, which includes housekeeping (5S), standardized work and visual control and management. Housekeeping (5S) is based on the idea that untidy, not organized work areas are not productive, hence housekeeping intend to provide a solution. The 5S stands for Seiri; which can be described as sorting, systematization and simplifying the organization of a workplace, Seiton; described as sort, self-arrangement, arranging and to set in order, Seiso; described as shine and sweeping, Seiketsu; standardization and standardized clean-up and lastly Shitsuke; which is described as self discipline (MLG Publications, 2013).

Seiri, or sorting, systematization and simplifying the workplace organization are intended to help simplify several issues. Firstly, workers must be able to find the item or gadget they are looking for, in the right time. One cannot spend time searching for things, since this time is looked upon as a waste. Quality and safety issues are also to be included since the right material and right gadgets must be used, and therefore in the right place at the right time. The safety issue implies a non-hazardous environment without having to risk falling or tripping over gadgets.
Seiton, to sort, self-arrange, arrange and to set in order, are all parts of undertaking a consistent and standardized way of doing things. This includes among others a standardized way of manufacturing and a standard way of doing documentation.

Seiso, to sweep and shine in order to obtain cleanliness are based upon the thought that people are happier and work better in a clean and tidy environment. This does also include the fact that the material or gadgets one want to use consistently are ready to use, and does not have to be fixed, refilled, or cleaned before.

Seiketsu, standardization and standardized clean-up is described as the mechanical means of obtaining the previous matters, to set these activities under constant improvement and on a regular basis.

Lastly, Shitsuke, described are self-discipline is the organizational culture, to make people want to provide the best maintenance in all levels of the organization. This can be thought of as a matter for the management since, but includes the whole organization likewise (MLG Publications, 2013).

2.1.8. Scientific management
The eight set of characteristics in Pettersens (2009) table is scientific management, which includes policy deployment (hoshin kanri), time/work studies, multi manning, work force reduction, layout adjustments and cellular manufacturing. All of the above characteristics are based upon the thought that one self might know what is best for the unit and specified tasks that they are doing, hence management must give the authorization to the employees, to constantly strive for improvement and a learning environment (Miller, 2005). To convert the companies visions into the individuals responsibility. This can be done in a variety of ways, the organizations vision can be segmented into different strategies for different parts of the organization in order to conduct a proper implementation technique (Tennant & Roberts, 2001). The difficulty is to find which strategy that is the most proper one. Hoshin kanri, or Policy deployment, is a tool designated to facilitate this activity. Moreover does Tennant and Roberts (2001) state that hoshin kanri purport the management’s way of using all of the organizations capabilities, i.e. people, goods and finances, and to bond these together in an optimal way with quality, timing, costs and volumes, in a deployed plan. The policy deployment does also include long time planning and organization of improvement strategies (Akao, 2004).

2.1.9. Bundled techniques
Bundled techniques are the ninth and final set of characteristics in Pettersens (2009) table. These include statistical quality control (SQC) and TPM/preventive maintenance. The first one includes means of statistical methods to control quality throughout the whole process. Different methods can be used during quality control, which include control charts and continuous improvement activities (Montgomery, 2009). The latter one, preventive maintenance implies the continuous maintenance in order to always have machines and
gadgets running as they should, to not cause any harm or risks for employees or the workflow (Montgomery, 2009).

2.2. Theoretical discussion – The Lean Enterprise

Lean, as commonly known as Lean Production, has been throughout discussed in the previous chapter. The new challenge is to convert the concept from an operational, production point of view onto a strategic, higher level with basis in the organizational culture. Womack and Jones (1994) call this new model the Lean Enterprise. The authors discusses that it might not be impossible for just one single part of a value stream to be lean, the value stream as a whole need to adapt this mindset. Moreover, the authors have stated that the concept of lean can be adapted and merged into all types of organizations and businesses. This theoretical discussion will provide a bridge between the previous chapter, focusing on Lean Production, towards a strategically Lean Enterprise and how the characteristics of Lean Production can be converted into terms adapted for Lean Enterprises. These findings will provide the basis for the survey conducted in this report and does hence answer the fourth research question; how can Lean Production be converted into methods suited for lean management on an organizational level?.

Just in time practices

The group of characteristics called just in time practices can in an organizational culture point of view imply the leveling of workload given to the employees, with the intention to create an ultimate workload that gives the employee the opportunity to fulfill the given tasks within the timeframe given. Moreover it can describe how managers can control that the employees are fulfilling, or are going to fulfill, the given tasks within the selected timeframe, and then being able to notice deviations in time to assess changes (Jones, 2006). In this way the right work will be able to be done in the right time, with the right employee working in the right speed.

Resource reduction

Resource reduction, with its given characteristics, can be translated into different ways of working that aims to constantly shorten leadtimes. These leadtimes can e.g. be customer complaints, and how the organization it tackling these, how quick the response may be and however it is constantly being improved. Another characteristic is the small lot production, which can be translated into working with small projects in small cycles, and not larger ones. Moreover can waste elimination see to which problems that can be found within the organization, if there is a structure to identify these, and how they are handled (Karlsson & Åhlström, 1996). Basically how, or even if, the organization tries to find what actions that do not create value for the customer.

Human relations management

The human relations management can in an organizational culture discuss in what way the organization are strengthening the competence of its employees, if there are any internal educations, and if so if these are scheduled or simply just are happening. It can also imply the question of cross training, if an employee can conduct a large variety of tasks or need to be
more focused on a few. Lastly this group of characteristics can discuss how the organization involves its employees, in regards to suggestions for improvement and how these are handled (Modig, 2011).

**Improvement strategies**
The group of characteristics concerning improvement strategies can in an organizational cultural environment discuss how, or even if, the organization strive for continuous improvement. However the organization has a scheme for these activities, if there are continuous meeting with the aim to discuss and tend to new changes and improvement. It might also discuss how these improvements are being followed up, and however there might be a policy for this as well (Modig, 2011).

**Defects control**
The defects control group with all its characteristics can be translated into an organizational concept as well. The basic thought of doing right from the beginning can be applied straight off, and also the need of finding faults, hidden or not hidden. Just as in a producing environment the employees might need the authorization to stop and trying to solve a problem when it has arisen (Karlsson & Åhlström, 1996). Faults in an organizational concept can be inside document or sketches or suchlike. The defects control tools presented in production environments can be viewed as guidelines or rules regarding what one should consider being a disruption or fault, and the question however one can find an automatic program aiming to find these disruptions or if the employee self is accountable for finding these.

**Supply chain management**
Supply chain management can be transformed into questions regarding however the organizations are using flowcharts as a natural part of the culture. This question is not specific for solely producing organizations, since measures regarding the information flow and other activities can be of importance. The same is true regarding supplier involvement, to analyze the degree of integration regarding not only concrete activities but also improvement activities (Maginer, 2003).

**Standardization**
Standardization can in an organizational culture imply standardized work in different levels and standardized suggestions regarding how to act in different situations, the main parameter is that they are throughout described an under continuous improvements. Visual control management, to visualize all activities in a plain and simple way so that all employees can be updated about projects and their status, activities and happenings, or layouts are also parameters needed to shed light on when adapting Standardization into an organizational culture (MLG Publications, 2013).

**Scientific management**
Policy deployment, or hoshin kanri, can be viewed as a major point within organizations, since this implies how to break visions and goals into specific strategies for employees, and also how one can make the company’s vision every employee’s responsibility, so that a clear
connection between an employee’s job description and the company’s goals can be understood. Time/work studies can also play an important role, since this can be translated into the question however different tasks have a set time reference. For example can this imply the waiting time on telephone for customers, and how the organization is handling it and improving it (Tennant & Roberts, 2001).

**Bundled techniques**
Since bundled techniques include methods of measuring and upholding a high degree of quality, it can be translated into an organizational culture in just such manners. From this point of view it can discuss however different complied techniques exist and are being used within the company, in order to create and ensure a high degree of quality (Montgomery, 2009).

**2.2.1. Formulation of hypotheses**
With the base of the theoretical chapter and the theoretical research discussion above, two hypotheses have been created, in regards to which parts, or groups of characteristics that is believed to stand out particularly. To use two hypotheses was chosen, where one group of characteristic is believed to be found while one other group of characterstic is believed not to be found within the participated companies.

Hypothesis 1 is based on the belief that scientific management can be seen as an easily transmitted concept into the organizational level of a company, and that can be impregnated through the whole organization, on all levels. Hoshin kanri, to break visions and strategies into specific strategies for each and every employee, to make each employee feel responsible to obtain the company’s vision (Tennant & Roberts, 2001), can be seen as a concept that can fit into many organizations and a step towards the Lean Enterprise. Hence, hypothesis one abides as follows;

\[ H1; \text{Scientific management characteristics will be found within the participating companies.} \]

Hypothesis 2 is based upon the theoretical discussion and explanation of defects control. In regards to its concept and ways of working can these characteristics be seen as somewhat difficult to implement within the whole organization, on all levels, since defects control mainly assesses automatic producing environments and ways of working (Karlsson & Åhlström, 1996). Therefore hypotheses 2 abide as follows;

\[ H2; \text{Defects control characteristics will not be found within the participating companies.} \]
2.3. Agile

Agility itself is not a new unique phenomenon, according to Kettunen (2009) the term is widely being used in manufacturing, supply chain management and in various types of development such as software-development. This study will focus on the developing side of agility and what the characteristics of agile development are and how these can be used in the improvement of a corporate organization, as a complementary philosophy to lean or by itself. As it is now, there is no exact definition of what agile software development is or what it consists of, which is something Abrahamsson et al (2010) have highlighted. Erickson et al (2005) on the other hand defines agility as follows: “agility means to strip away as much of the heaviness, commonly associated with the traditional software-development methodologies, as possible to promote quick response to changing environments, changes in user requirements, accelerated project deadlines and the like”.

Ketunnen (2009) have compiled a list of different agile definitions from 1998 to 2006 where the main similarities are that most of them address quick responses to unpredictable changes and to be able to take advantages of unstable situations. How this manifests is of course something that differs from situation to situation.

Agile development is a people-centric view to software development and considers that in order to call a developing method agile it has to fill the following criteria:

“The processes need to be incremental and work with small releases and in rapid cycles. It needs to be cooperative where the customer and the developer work closely together and with a high grade of communication. The process has to be straight forward, which implies that it has to be easy to modify, understand and to be well documented. The method also needs to be adaptive where changes can be made in the process” (Abrahamsson et al, 2010).

Hilkka et al (2005) state that agile methods target the soft- or human side of software-development over institutional aspects. The agile philosophy stresses diversity of products and methods which needs multi-skilled workers and an approach where the for the moment best suitable supplier are being favored over long term relationships (Comm & Mathaisel 2000). Hunt (2006) states that an agile model shall fulfill its purpose but no more, it shall be easy to understand by its user but does not have to be clear to everyone, the model also needs to be real simple.

The main differences between lean and agile is that agile systems are mainly used in environments where the demand is unstable and the requirement for variety is high and the organization needs to be able to respond quickly, while lean is more suited for a predictable environments where the demand for high volumes and low variety are most common (Christopher, 2000). Naylor et al (1999) also points at the difference between lean and agile philosophy where agility uses market knowledge and virtual establishment to exploit profitable opportunities in an unpredictable market place while lean is more focused on eliminating all waste.
2.3.1. Agile Implementations

Even if agility mainly is being associated with software development and supply chain management, Christopher (2000) states that agility is a business-wide capability that embraces organizational structures, inform systems, logistics process and flexible mindsets, which means that the methods that have been established in software-develop environments also can be applied in other situations. These other types of situations according to Kettunen (2008) are: business/enterprise environments, agile organization and workforce, IT agility, manufacturing, agile supply chain management and agile software-development.

Dybå and Dingsøyr (2008) have in their article compiled a list of six main methods that can be described as the most common agile methods: crystal methodologies, dynamic software, development method (DSDM), feature-driven development, lean software development, scrum and extreme programming (XP; XP2). Abrahamsson et al (2010) further states that agile methods share a lot of similarities but differs in the way that some are more focused than others, some support different phases in the software product development and concreteness in how the methods are linked to actual development.

2.4. Pilot studies

Classic objectives of a pilot study are to identify issues related to design, sample size, selection procedures of data collection, methods of data analysis and study conceptualization (Jairath et al, 2000). A pilot study also serves the purpose of identifying potential roadblocks that needs to be addressed before the full study is being performed (ibid). The purpose of the pilot study is generally not to answer if the study works or not but to test if the intervention is feasible (ibid).

If the main study will contain closed questions, open questions can be asked in the pilot study in order to generate the closed answer questions, if everyone who answers the questions in the same way so the data are doubtful to be of interest because they do not form a variable (Bryman, 2012). Even with a small sample size in the pilot study, the data and the results can be important statistically and time-saving to other researchers; therefore it is important to publish the results even if the study has a small sample size.

According to Hertzog (2008) the general guideline for the sample of a pilot study is 10% of the full study. If the sample size has not been achieved the study should instead be called a small exploratory study (Conelly, 2008). Characteristically an exploratory study tends to focus on one area of interest or just one or two variables and is frequently used in the field of nursing (Huttlinger, 2006).

2.5. Survey

Since we have choose to perform a survey in this study we will in the following chapter explain the main characteristics in a survey and highlight what is important to focus on when performing a survey.
When performing a survey it is similar to performing an interview with the difference that in a survey it is the studied person that fills in the answers instead of the questioner (Trost, 2012). Bryman (2012) defines a survey as “a cross-sectional research design in which data are collected by questionnaire or by structured interview”, by cross-sectional design Bryman (2012) means there needs to be more than one case that are being examined because there can be interesting variations, the data needs also to be collected simultaneously. Trost (2012) on the other hand defines the word survey to include all quantitative questionnaires Trost, (2012).

To establish variation between the different cases it is important that the data is quantitative or quantifiable and that the data have been collected in a systematic and standardized way. Bryman (2012) has compiled a list of several steps that need to be conducted when performing a social survey:

1. Issue(s) to be researched
2. Review literature/theories relating to topic/area
3. Formulate research question(s)
4. Consider whether a social survey is appropriate (if not, consider an alternative research design)
5. Consider what kind of population will be appropriate
6. Consider what kind of sample design will be employed
7. Explore whether there is a sampling frame that can be employed
8. Decide on sample size
9. Decide on mode of administration (face-to-face; telephone; postal; email; Web)
10. Develop questions (and devise answer alternatives for closed questions)
11. Review questions and assess face validity
12. Pilot questions
13. Revise questions
14. Finalize questionnaire/schedule
15. Sample from population
16. Administer questionnaire/schedule to sample
17. Follow up non-respondents at least once
18. Transform completed questionnaires/schedules into computer readable data (coding)
19. Enter data into statistical analysis program like SPSS
20. Analyze data
21. Interpret findings
22. Consider implications of findings for research questions

Bryman (2012) further states that there are two different types of questionnaires: Self-completion questionnaire and structured interview. The latter is in many ways the same as a self-completion questionnaire with the difference that there is an interviewer that administrates and asks the questions. The most common form of a self-completion
questionnaire is the postal questionnaire, a form that also requires some administration in terms of handing or sending out the questionnaire (ibid). A problem with postal questionnaires is that if the survey gets a low response rate it is hard to know if the once that did not answer differs from the once that did, if so the findings relating to the sample will be effected (Bryman 2012).

Dillman et al (2009) points out that a clear and eye appealing structures helps to enhance the respond rates, instead of trying to fit as many questions on to one page just to try to make the survey look shorter, only makes it look unattractive. Instead it is better to leave some space between the questions. According to Bryman (2012) it is important to give clear instructions on how the respondents shall answer, if for example one respondent choose more than one answer when there are only demanded one answer, the answer should be treated as if it was not answered.

When asking questions that focus on attitudes there are two ways of questioning, in the first the respondent may consider a set of assertions and from that point out to what degree the respondent agrees or disagrees, the other way is to ask question where the respondent can answer with a yes or a no. Trost (2012) states that if one uses assemblies in a big way, the respondents might get bored with the questions.

When constructing answer options for a survey one can either use open or closed questions, or what is called non structured or structured questions. Trost (2012) recommends the use of closed questions and points at two reasons: It is time-saving to use closed questions because you do not have to decipher what the respondents have answered if they do not use the same type of language, some may answer with key words and some may respond in long sentences. The other benefit of using closed questions is that you do not have to handle problems with respondents that do not answer the questions because they do not feel that they know what they think, they may feel a unfamiliarity with the written langue and tends not to answer the question. Another benefit of using closed questions is that it is possible to pre-code the questions, making the process of analyzing the data much easier (Bryman, 2012).

Bryman (2012) discusses the problem that an interviewer and the respondent do not share the same meaning of words. Words represent different things to different people which can make it hard to explain exactly what you as an investigator want to express. Here it is very important to be clear and use a language that minimizes the risk of confusion as an investigator.
3. Method

This chapter will give the reader an understanding about how this thesis’s study has been made. Firstly will the qualitative method of choice be displayed, and later the survey and its appearance, implementation and summary. This chapter includes an explanation of a pre-study, sample seize and validity and reliability.

3.1. Quantitative method of choice

For this study a cross-sectional design with a quantitative self-completion survey grounded on theories regarding lean and agile methods have been chosen. Since the purpose of the study was to see if companies on the Swedish textile market work with lean and agile methods, the authors have drawn the conclusion that the a quantitative method is most suitable because the study was able to compare and explain connections between different variables (Backman, 2008).

This made the authors able to examine if there was a connection between how workers at Swedish textile companies perceive their daily working routines with what lean and agile work methods are based on in theory. When using a quantitative method it is also possible to compile the results statistic and by that analyse the collected data (Bryman 2012).

For this study a qualitative method could also have been an alternative, for example deep interviews or focus groups could answer the purpose of the study. These methods may have given the authors a deeper understanding in the subject. But with a qualitative method there would not have been an opportunity to perform statistical calculations to examine the connections between the established hypotheses.

In this study there have primary been used data in the form of a survey because there are no usable secondary data in form of previous research on the subject. Secondary sources contain of literature and articles that concerns and describes lean and agile work methods which we have used to analyze the collected data.

3.2. Sample

The survey in this study targets workers at Swedish textile companies; since it is not possible to examine the total population of the Swedish textile sector there needs to be a selection of respondents. Because the study had a limited time frame and budget to work with, the authors have used a convenience sample in order to define the respondents. By using connections at the Swedish School of Textiles the authors had the opportunity to get in contact with three companies in the surrounding area that could answer the survey. To get a better and more trustworthy result 5-7 companies would have been ideal but due the time frame of this study, the authors of this paper could not find respondents that could answer the survey within the specific time frame.
According to Christensen et al (2010) convenience sample means that the researcher use the sample that she have access to, the negative aspect of the sample method is that everyone in the population does not have the ability to be in research and there may occur some deviations, this type of sampling method is on the other hand suitable if you suspect that there are small differences between the studied respondents.

The survey has been handed to respondents at Textile companies that are located in the south-west of Sweden. By limiting the study to just contain companies in the south-west of Sweden there might be a deviation in relation to the rest of the country. To minimize this risk the authors have chosen companies of varying character, size and orientation (Bryman, 2012). A short description of the participating companies is presented below;

Company number one is one of Sweden’s biggest producers of advanced textiles and have around 90 employees and had a turnover of 120 million SEK 2011-2012.

Company number two operates within the active wear segment that produces and sells on the Swedish and the foreign market. They have around 15 employees and had in 2011-2012 a turnover of around 120 million SEK.

Company number three is part of a corporate group that produces and sells apparel for men in both Sweden and on the foreign market. They have around 150 employees in the whole corporate group and had a turnover of around 400 million SEK in 2011-2012.

3.3. Literature search
To gain insight in the fields of lean production and agile development the authors started by studying the literature the library of Borås university had available in respectively area, by studying the literature the authors noted a few crucial key words that was used to perform online research for relevant articles, which were Lean, Lean Enterprise, Lean Production, Agile, Agile software development, and the names of the groups of characteristics in Pettersens (2009) table. This paper theoretical foundation is mainly built on scientific articles found in the online databases Web of Science and Scopus. In order to be sure that the information in the articles are relevant the authors have strived to only use articles that are new and top cited. This can be a problem when top cited articles tend to be a little older and may be out of date while new articles has not been able to gain acceptance as theory (Bryman, 2012). This is something the authors have solved by study both top cited articles as well as newer articles and tried to get good balance between new and grounded theory. To gain insight in the works on how to create a survey and a pilot study the authors have both used established method books but also articles focused on how to conduct a pilot study.

3.4. Implementation of study
The study deals with relationship between the respondents’ perceived sense of working with lean and agile philosophies and methods compared to what characteristic theory and previous studies describes as lean and agile methods. The study also deals with the two hypothesis that states that characteristics of scientific management is believed to be found in the work methods of the companies that have been examined, as well as defects control is a group of characteristics and work methods that companies is not believed to use.
3.5. Survey appearance

Since the study is based on the Swedish textile market the survey was written in Swedish just because the majority of the respondents have Swedish as their native language, which facilitates when it comes to understanding the assertions that they should consider. If the English language would have been used there may have been a risk of not have gotten the best and most genuine answers from the respondents. The assertions in the survey are being presented in the following table translated from Swedish to English. A connection between the assertion and the theory/author is also being presented.

The questions in the survey is divided into two parts, the first 29 questions deal with assertions regarding how Pettersen (2009) define the different parts of the lean concept which the theoretical chapter is based upon. The final four questions regard agile work methods that are based on Abrahamssons et al. (2010) article where they break down the concept of agile work methods need to consist of from studying a series of agile theory.

To determine what working position the respondent have the survey have used a nominal scale and to define what perception the respondent have to the various assertions an Likert interval scale of one to seven where one represent do not agree at all and seven fully agree have been used (Bryman, 2012). Since the survey will be conducted in Sweden, the use of a Likerts scale can be of preference, since the respondents now are forced to choose a side, instead of i.e. yes or no answers where one also can choose to make no answer (Bryman, 2012). Since Swedish people might not be looked upon as being as willing to give strong answers as for i.e. Americans, a Likers scale is viewed as a good instrument in the survey.

In table 2 are the different assertions that are being used in the survey are being presented in groups that Pettersen (2009) use in his paper as well as Abrahamssons et al. (2010) study on agile work methods. In table 3, on the next page, the assertions are being linked to its original author.

<table>
<thead>
<tr>
<th>Pettersen's (2009) groups of characteristics, agile</th>
<th>Survey assertion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Just in time practices</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>Resource reduction</td>
<td>5, 6, 7, 8</td>
</tr>
<tr>
<td>Human relations management</td>
<td>9, 10, 11, 12</td>
</tr>
<tr>
<td>Improvement strategies</td>
<td>13, 14, 15, 16</td>
</tr>
<tr>
<td>Defects control</td>
<td>17, 18, 19</td>
</tr>
<tr>
<td>Supply chain management</td>
<td>20, 21</td>
</tr>
<tr>
<td>Standardization</td>
<td>22, 23, 24</td>
</tr>
<tr>
<td>Scientific management</td>
<td>25, 26, 27, 28</td>
</tr>
<tr>
<td>Bundles techniques</td>
<td>29</td>
</tr>
<tr>
<td>Agile</td>
<td>30, 31, 32, 33</td>
</tr>
</tbody>
</table>

Table 2, Survey assertion background, own table
### Survey assertion and theoretical connection

<table>
<thead>
<tr>
<th>Assertion</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assertion 1</td>
<td>Each project or task I am working on is linked to a clear customer requirement or business need</td>
<td>Karlsson and Åhlström (1996)</td>
</tr>
<tr>
<td>Assertion 2</td>
<td>I report the status of the project/projects I'm working on continuously and deviations from the plan are clear</td>
<td>Karlsson and Åhlström (1996)</td>
</tr>
<tr>
<td>Assertion 3</td>
<td>We have a fixed work pace that I follow</td>
<td>Jones (2006)</td>
</tr>
<tr>
<td>Assertion 4</td>
<td>In my team, we work to smooth the workload between team members in a structured way</td>
<td>Andersson, Eriksson and Torstensson (2006)</td>
</tr>
<tr>
<td>Assertion 5</td>
<td>I am continuously aware of activities I do but do not add value for the customer</td>
<td>Karlsson and Åhlström (1996)</td>
</tr>
<tr>
<td>Assertion 6</td>
<td>I have a given structure in my work where problems and shortcomings become clear</td>
<td>Karlsson and Åhlström (1996)</td>
</tr>
<tr>
<td>Assertion 7</td>
<td>I work constantly with trying to shorten the time it takes me to carry out my tasks</td>
<td>Karlsson and Åhlström (1996)</td>
</tr>
<tr>
<td>Assertion 8</td>
<td>In my team, we question our ways of working to continually identify ways to improve</td>
<td>Sanchez and Perez (2001)</td>
</tr>
<tr>
<td>Assertion 9</td>
<td>There is a schedule for how often I go to education and training</td>
<td>Velaction (2013)</td>
</tr>
<tr>
<td>Assertion 10</td>
<td>In my team, we can perform each other's work</td>
<td>Sanchez and Perez (2001)</td>
</tr>
<tr>
<td>Assertion 11</td>
<td>In my team all members are involved in efforts to describe methods and planning the department</td>
<td>Velaction (2013)</td>
</tr>
<tr>
<td>Assertion 12</td>
<td>My boss is continuously coaching me in my work</td>
<td>Velaction (2013)</td>
</tr>
<tr>
<td>Assertion 13</td>
<td>I have the opportunity to contribute to improvement</td>
<td>WTGNews (2010)</td>
</tr>
<tr>
<td>Assertion 14</td>
<td>I believe that the improvements I suggest is being noticed in a proper way</td>
<td>Sanchez and Perez (2001)</td>
</tr>
<tr>
<td>Assertion 15</td>
<td>Suggestions for improvement and ideas are sought constantly by my boss</td>
<td>Modig (2011)</td>
</tr>
<tr>
<td>Assertion 16</td>
<td>In my team, we have regular meetings to address and discuss improvements</td>
<td>Modig (2011)</td>
</tr>
<tr>
<td>Assertion 17</td>
<td>There are clear rules and guidelines on what to consider as faults or deviations in my work</td>
<td>Karlsson and Åhlström (1996)</td>
</tr>
<tr>
<td>Assertion 18</td>
<td>In the process I work in, we have built in functions that prevents failure in our processes</td>
<td>Karlsson and Åhlström (1996)</td>
</tr>
<tr>
<td>Assertion 19</td>
<td>I am responsible for the quality of the operations I perform</td>
<td>Karlsson and Åhlström (1996)</td>
</tr>
<tr>
<td>Assertion 20</td>
<td>In my team we use flowcharts and process mapping as a natural part of the work</td>
<td>Modig (2011) and Maginer (2003)</td>
</tr>
<tr>
<td>Assertion 21</td>
<td>At my company suppliers are involved in projects and improvement activities</td>
<td>Karlsson and Åhlström (1996)</td>
</tr>
<tr>
<td>Assertion 22</td>
<td>At the company, we have our working methods clearly described</td>
<td>MLG Management Consultants (2013)</td>
</tr>
<tr>
<td>Assertion 23</td>
<td>We have clear descriptions of how to proceed in different situations</td>
<td>MLG Management Consultants (2013)</td>
</tr>
<tr>
<td>Assertion 24</td>
<td>I can easily find and check the status of activities and projects going on within the business</td>
<td>MLG Management Consultants (2013)</td>
</tr>
<tr>
<td>Assertion 25</td>
<td>I have the authority to implement minor improvements that I feel are suitable in my work</td>
<td>Miller (2005)</td>
</tr>
<tr>
<td>Assertion 26</td>
<td>I see a clear connection between my work and the strategic/long term goals that are set for the organization</td>
<td>Tennant and Roberts (2001)</td>
</tr>
<tr>
<td>Assertion 27</td>
<td>To work towards the corporate vision is my responsibility</td>
<td>Tennant and Roberts (2001)</td>
</tr>
<tr>
<td>Assertion 28</td>
<td>The activities I do have an estimated execution time</td>
<td>Pettersens (2009)</td>
</tr>
<tr>
<td>Assertion 29</td>
<td>We have developed various techniques to ensure a good quality of the tasks I perform</td>
<td>Montgomery (2009)</td>
</tr>
<tr>
<td>Assertion 30</td>
<td>We work with the best possible price from our suppliers, instead of long-term relationships</td>
<td>Abrahamsson et al (2010)</td>
</tr>
<tr>
<td>Assertion 31</td>
<td>At the company, we document our working methods</td>
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<td>Assertion 32</td>
<td>In my team, we have a clear dialogue with our customers where clear goals and priorities are discussed</td>
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<tr>
<td>Assertion 33</td>
<td>In my team, we put a work plan with planned tasks for the next 2-4 week period</td>
<td>Abrahamsson et al (2010)</td>
</tr>
</tbody>
</table>

Table 3, Survey assertion and theoretical connection, own table
Assertion 1 - Each project or task I am working on is linked to a clear customer requirements or business need is designed to find out if the respondent perceivers that she is part of a just in time concept which Karlsson and Åhlström (1996) describes as a concept where every process should be given the right part, in the exact right quantity, in the exact right point in time.

Assertion 2 - I report the status of the project/projects I'm working on continuously and deviations from the plan are clear aim to find out if the respondent has to report how far she is from deliver/close the project, Jones, (2006).

Assertion 3 - We have a fixed work pace that I follow targets the question if the respondent works with heijunka that Jones (2006) defines as production leveling.

Assertion 4 - In my team, we work to smooth the workload between team members in a structured way is connected to leveling the workload between the employees as described in the just in time group of characteristics (Karlsson & Åhlström, 1996).

Assertion 5 - I am continuously aware of activities I do but do not add value for the customer is connected to waste elimination which Karlsson and Ahlström (1996) says is everything that does not add value to the product.

Assertion 6 - I have a given structure in my work where problems and shortcomings become clear aims to see if there are built in functions that help the respondent to identify waste in her daily work (Karlsson & Åhlström, 1996).

Assertion 7 - I work constantly with trying to shorten the time it takes me to carry out my tasks targets to answer the question to what degree the respondent feels she in her daily work routines get the chance to improve her working methods (Karlsson & Åhlström, 1996).

Assertion 8 - In my team, we question our ways of working to continually identify ways to improve is aimed to see if the respondent takes it up on her to identify ways to improve her work in order to create value for the customer (Sanchez & Perez, 2001).

Assertion 9 - There is a schedule for how often I go to education and training targets the question if the company of the respondent have program for continually training or if the education is something that happens randomly.

Assertion 10 - In my team, we can perform each other's work targets the area of cross training and multifunctional teams and to what degree the respondent feels she is able to which.

Assertion 11 - In my team all members are involved in efforts to describe methods and planning the department aims to look into area of to what degree the respondent is part of any employee envelopment.

Assertion 12 - My boss is continuously coaching me in my work sets to answer the question if the respondent gets the chance to feel confident and creates a high performance environment where to employees can contribute to upholding the company vision (Miller, 2005).
**Assertion 13** - *I have the opportunity to contribute to improvement* targets the thoughts on that employees knows their job best and can therefore contribute to improve her working environment.

**Assertion 14** - *I believe that the improvements I suggest is being noticed in a proper way* aims at Sanchez and Perez (2001) assumptions that continuous improvement must be involve both employees as well as managers.

**Assertion 15** - *Suggestions for improvement and ideas are sought constantly by my boss* is linked to improvement strategies, to involve employees in the continuous improvements of the organization.

**Assertion 16** - *In my team, we have regular meetings to address and discuss improvements* aims to see if the respondents have to change to influence and to offer suggestions on improvements (Modig, 2011).

**Assertion 17** - *There are clear rules and guidelines on what to consider as faults or deviations in my work* this assertion is meant to translate the approach of defects control from traditional production to the work ways on management level.

**Assertion 18** - *In the process I work in, we have built in functions that prevents failure in our processes* aims to see if the respondent works with some sort of automation (jidoka), failure prevention (poka yoke) or 100% inspection which are three defects control work ways that Karlsson and Åhlström (1996) discusses.

**Assertion 19** - *I am responsible for the quality of the operations I perform* targets the system of 100% inspection where the employee strives to prevent all types of fails and errors from occur (Karlsson & Åhlström, 1996).

**Assertion 20** - *In my team we use flowcharts and process mapping as a natural part of the work* aims to identify if the respondent is actively working to identify waste and how non-value adding information is traveling in the system or the supply chain which Modig (2011)

**Assertion 21** - *At my company suppliers are involved in projects and improvement activities* aim to identify if the respondent works closely with her companies suppliers. This is something Karlsson and Åhlström (1996) points out as an approach that can shorten lead-times.

**Assertion 22** - *At the company, we have our working methods clearly described* aims to examine if the respondents perceive that her company works with standardized work methods, if so the company shall have clear documentation of how the different work steps shall be performed.

**Assertion 23** - *We have clear descriptions of how to proceed in different situations*, is linked to situations that are not common in the daily work routines, to see if these situations have a description of how to act when something extraordinary occurs (Karlsson & Åhlström, 1996)
Assertion 24 - I can easily find and check the status of activities and projects going on within the business is an assertion that aims to find out if the company that the respondent work at uses the method of Seiton which MLG Publications (2013) describes as working with documentation in a standardized way.

Assertion 25 - I have the authority to implement minor improvements that I feel are suitable targets to answer the question if the respondent according to the principles of scientific management (Miller, 2005) has the authority to act on one’s own if one feels that one knows what is best in different situations.

Assertion 26 - I see a clear connection between my work and the strategic/long term goals that are set for the organization aims to find out if the respondents company works with some sort policy deployment/hoshin kanri in order to transfer the company vision to the daily work of the employee (Tennant & Roberts, 2001).

Assertion 27 - To work towards the corporate vision is my responsibility targets to find out if not only the company work with some type if policy deployment but also to find out if the respondent feels she has embraced the strategy.

Assertion 28 - The activities I do have an estimated execution time targets to find out if the respondent work with some type of time study that is a vital part of scientific management according to Pettersen (2009).

Assertion 29 - We have developed various techniques to ensure a good quality of the tasks I perform is set to answer the question if the respondent work with some sort of bundle techniques such as statistical quality control or TPM (Montgomery, 2009).

Assertion 30 - We work with the best possible price from our suppliers, instead of long-term relationships is set to answer if Abrahamsson et al (2010) assumption that in an agile environment, thinking of what is best for the moment in better than working in long terms.

Assertion 31 - At my company, we document our working methods aims to see if the respondent perceive that she work with the documenting her working methods which according to Abrahamsson et al (2010) is a characteristic for an agile environment.

Assertion 32 - In my team, we have a clear dialogue with our customers where clear goals and priorities are discussed, targets the principal of a clear dialog with customers that are a distinctive agile attribute (Abrahamsson et al, 2010).

Assertion 33 - In my team, we put a work plan with planned tasks for the next 2-4 week period, aims to see if the respondent is working in short cycles which is something that is common in an agile organization (Abrahamsson et al, 2010).

3.6. Pre Study
After have completed the design of the survey the authors started off by letting 10 different students at Borås Högskola look through and perform the survey and leave comments on the structure, as well as leave comments on if they understood the assertions. The test-population
contained five females and five males of different ages. The purpose of the pilot study was the see if the langue used in the survey felt correct and that the true meaning of assertions was understood by the respondents (Bryman, 2012). This led to a few minor modifications of the survey in the use of langue and how the assertions were being presented.

One important part in the pilot study was to see how long it took to answer the survey. Since the survey was intended to be distributed in various companies, the authors felt it was crucial to have a survey that was easy to understand and didn’t take up too much time for the respondents. The pre study took approximately six minutes to answer for each respondent, which we felt was acceptable.

3.7. Implementation of survey
The study was conducted the 13th and 14th of May 2013 on three different textile companies in the south-west of Sweden. At company number one, the R&D controller helped distribute the survey to five different persons that felt relevant for our study. At company number two the contact person who works as a purchasing manager helped us distribute the survey to five different respondents. Since they were not able to answer the survey right away, our contact person sent us the executed survey and we received it on the 17th of May, this is something that according to Bryman (2012) can affect the way the respondents answers the survey since we don’t have control over the execution. The contact person was in agreement on how the survey should be concluded. At company number three we got meet the purchasing manager who helped us distribute the survey to his/her who quickly answered it without any forms of complications.

3.8. Summary of survey
The collected material have been compiled in Microsoft excel and processed in the statistics software Minitab. The survey generated a total of 16 answers and a hundred percent response rate. All 16 completed surveys were used in the study since all of them properly completed without any form of extreme answers where the respondents only answered with one or seven. Since the control assertions generated notes of uncertainty it was impossible to perform a correlation analysis on the study which was the intentions. This is something that needs to be considered and dealt with if a researcher intends to use this survey in bigger scaled study.

3.9. Presentation of data
The results of the survey are being presented in chapter four and are being divided in two parts; in number one the results of the respondent’s opinions on the assertions where the statistics have been presented in graphs and texts completed in Microsoft Excel and Minitab 15 and grouped according to table number two. In part number two are the assertions that generated notes from the respondents with information on uncertainty regarding the design of the assertions.
The second part where also meant to contain a correlations analysis between assertion number three *We have a fixed work pace that I follow* and assertion number 28 *The activities I do have an estimated execution time* that both where created to look into how the respondents work with fixed time schedules. Unfortunately assertion number three generated a series of notes making it impossible to perform the analysis on these two assertions.

### 3.10. Reliability
Reliability means to what degree the collected data and analyse conforms the result. To get absolutely top reliability another researcher shall be able to perform a study with the same measurement and be able to get the same result (Christensen *et al*, 2010).

A problem with this study is that the theories that form the basis of our research is absolutely rooted but may be slightly different depending on which study one look into. However, To build upon Pettersen (2006) and Abrahamsson *et al* (2010) studies of lean and agile philosophies and methods gives the study a good and creditable base since both articles are up to date and have been cited 93 respective 486 times.

To see if the respondents had understood the assertions and if the study would answer its purpose one control question for a correlations analysis have been created. The method that has been chosen for this correlation analysis is Cronbach’s alpha which was indented to determine if the internal consistency is high enough. Cronbach’s alpha is a data analysis method used to control the internal reliability often used in computer software such as SPSS. A computed alpha confident will vary between zero and one where zero represents no internal reliability and one indicates perfect internal reliability (Bryman, 2012).

### 3.11. Validity
Internal validity means the extent to which the chosen method measures what it is intended to measure. This is important from a point of view where you look at how credible the study is. (Christensen *et al*, 2010). One way to strengthen the validity is to compare the studies assertions with previous studies and see if there are any connections. But since there are no previous studies in this area, that is impossible (Bryman, 2012). During the execution of the survey there were no signs of that the respondents or our contact persons did not understand how to fill in the survey or that they were under stress during the performance. However some assertions generated notes where some of the respondents did not understand the assertions making it hard to use this survey without a few minor changes.

External validity measures with to what degree the study can be comprehensive beyond the specific research context (Bryman 2012). Since this study examines how lean and agile work methods are being used within the organizational level of textile companies, the study will also be able to be performed in other sectors similar to the one dealt with in this study.
4. Results

In this chapter the results of the survey will be presented with a short summary underneath to enhance the readers’ comprehension. The chapter is aligned with Pettersens (2009) table of characteristics, with one graph for every group of characteristics, named thereafter. The survey assertions are named A1 till A33 and can be found above each graph with the Likerts scale underneath, note that only the numbers on the Likerts scale that have answers are showed. Number one on the Likerts scale implies that the respondent does not agree with the assertion, hence number seven implies that the respondent does strongly agree. This chapter will give the reader a clear view of all the answers from the conducted research, and will in the next chapter, analysis, be given a discussion regarding the survey results that are of significance. The survey consists of a total of 16 respondents.

4.1. Just in time practices

The first four assertions in the survey are connected to Pettersens (2009) group of characteristics named just in time. As the table above shows assertion one (A1) does provide strong indications, solely answers from five till seven except for one answer at number one, that the projects and/or job assignments are connected to a distinct customer- or operational demand.

Regarding A2, A3 and A4 no distinct indications can be made, since the answers are too scattered, however there are a majority of answers on the upper half of the scale on assertion number two. Moreover the majority of the respondents did keep to the middle, number four and five, on the Likerts scale on assertions three and four, howsoever these answers cannot provide a strong enough ground to give indications in any direction.
4.2. Resource reduction

Assertion number five till eight in the survey are connected to Pettersens (2009) group of characteristics named resource reduction. All assertions regarding this group of characteristics are too scattered to give any indications, regardless of the fact that assertions six and seven have scores on the upper side of the scale, but not strong enough to provide identification.

4.3. Human relations management

Assertion nine till 12 are based upon Pettersens (2009) group of characteristics called human resource management. As the table shows assertion nine does give strong indications that there are no schedules for how often the employees are supposed to undergo education. Moreover the answers for assertion 10 till 12 (A10-A12) are too scattered to provide any indications.
4.4. Improvement strategies

Improvement strategies consists of the adjacent group of characteristics in Pettersen (2009) table, which assertion 13 till 16 are representing. As the table displays both assertion 13 and 14 does give strong indications of high scores, which indicated that the respondents believe themselves having the possibility to contribute with ideas of improvement and that the ideas of improvements that are suggested get the attention wanted. Assertion 15 and 16 (A15, A16) are to scattered an answer to provide indications.

4.5. Defects control

The next set of characteristics in Pettersen (2009) table is defects control, which is represented by assertion 17 till 19. Assertion 17 and 18 (A17, A18) have to scattered answers to give indications, however assertion 19 does indicate that the employee self is in charge of the quality standard of the job tasks and activities and that no automatic systems for defects control are being used.
4.6. Supply chain management

Assertion 20 and 21 represents Pettersens (2009) group of characteristics named supply chain management. Assertion 20 is much too scattered to give any indication regarding the outcome, likewise assertion 21, the latter one does however have scores on the upper side of the scale, with might give a very vague indication that suppliers are involved in projects and improvement activities.

4.7. Standardization

Pettersens (2009) group of characteristics called standardization is represented by assertion 22 till 24. In terms of the ability of drawing indications regarding standardization and standardized ways of working no strong suggestions can be made since the answers are too diffuse, however one can see that the answers are kept to the middle of the Likerts scale.
4.8. Scientific management

 Assertion 25 till 28 represents Pettersen’s (2009) group of characteristics named scientific management. As the table shows, assertion 25, 26 and 27 give strong indications that all the respondents gave a high score on these assertions, agreeing with the statements given. These includes that one believes oneself to have the authority to implement smaller improvements that one thinks are needed, that one see a clear connection between ones job tasks and the strategic and long-term goals for the organization and lastly, that to strive towards the company’s vision is my responsibility. The last assertion within this group does give a too vague answer to give any indications.

4.9. Bundled techniques

 Bundled techniques are the next group of characteristics in Pettersen’s (2009) table, which is represented by assertion 29. As the table shows, the answers given are too much scattered to give any indications regarding this matter in any direction.
4.10. Agile

The agile parts of the theoretical chapter are represented by assertion 30 till 33. All of the above assertions provide too loose a ground in order to provide any indications, since the scattering are too wide. However, one can see that some numbers have higher scores, but not efficient enough to provide a ground for making indications.

4.11. Comments per assertion

The respondents were able to comment the surveys while giving the answers, if some question were unclear or such. The table above shows which assertions that got a comment and if so, also how many. Assertion number three got the highest number of comments, namely three, while assertion seven and 33 got two each. Assertion six, eight and eleven got one comment each.
5. Analysis

In this chapter the reader will be given a combined analysis of the results of the survey i.e. the theoretical chapter, theoretical discussion and test of hypotheses joined with the results of the conducted survey. Later an analysis of the formation of the survey will be provided with suggestions for improvements for using it in a future research.

5.1. Analysis of survey results

With the base in how this thesis has chosen to categorize the concept of lean and agile, and which characteristics lean possesses, certain indications can be made. The general overall answers indicates that lean do exist, and on some areas more than others. Since the sample seize in this research is limited, no general answers can be made, rather indications that can point in certain directions. In this chapter the answers given in the survey that stands out in a particular way will be discussed, since the assertions with too wide a scattering can give no indications.

The first assertion, “Each project or task I am working on is linked to a clear customer requirements or business need”, which is based upon Pettersens (2009) group of characteristics named just in time practices, gave a strong concurring answer, which indicates that the participated companies are working after a specific demand. This can be linked to both production leveling (heijunka), pull system (kanban) and overall just in time practices, describes in the theoretical chapter. Karlsson and Åhlström (1996) states that the overall basic meaning with just in time practices are that every part is where it is needed at the precise right time, which can refer to only producing and handling the specific tasks needed. Production leveling (heijunka), to supply customers with exactly what is demanded can also be closely connected to this assertion, since each project or task is connected to a specific need, which might be known or unknown, but that can however create a type of stability, which Jones (2006) describes a vital. Lastly the first assertion and its answers can indicate a pull system, customer pull that is, that customer sends a kanban of what is demanded or needed and the participated companies tries to strive after satisfying their need. This does however not indicate if the participated companies are holding large stocks or not, which is a part of a kanban system (Romeo & Esparrago, 1988; Womack et al., 1990; Womack & Jones, 1996).

Assertion number nine, “There is a schedule for how often I go to education and training”, which is a part of Pettersens (2009) group of characteristics named human relations management, does stand out just like the previous assertion but in another direction. The majority of all respondents have answered fairly low on this assertion which indicates that there are no schedules for employee educations. Womack and Jones (1994) illuminate the importance of constantly educating employees and to create a continuous learning platform within each function of a company, which this answer indicates, does not occur at the participated companies. Modig (2011) does also discuss the importance of having a clear structure regarding the way organizations strengthen the competence of its employees, and
that when involving employees to gain a greater competence also can adhere to greater suggestions for improvement.

The two assertions number 13 and 14, which both is a part of Pettersens (2009) group of characteristics named improvement strategies, “I have the opportunity to contribute to improvements” and “I believe that the improvements I suggest is being noticed in a proper way”, were both strongly agreed with. Modig (2011) implies that employees that are giving suggestions for improvements and that gets these noticed feel more involved and motivated to improve the organization. Sanchez and Perez (2001) states that the process of continuous improvement must involve the whole organization, not only top management and that employee are given the opportunity for doing this is a must, something that assertion number 13 and 14 are indicating being adhered to within the participated companies. Moreover does Modig (2011) state that meetings addressed to discuss continuous improvements are nowadays a vital instrument, something that assertion number 16, “In my team, we have regular meetings to address and discuss improvements”, does not indicate to concur with.

Within Pettersens (2009) group of characteristics named defects control assertion 19 can be found, which is “I am responsible for the quality of the operations I perform”. This assertion indicated very strong agreements, while the latter ones within the same group, assertion 17 “There are clear rules and guidelines on what to consider as faults or deviations in my work” and assertion 18 “In the process I work in, we have built in functions that prevents failure in our processes” indicated agreements on the opposite side. What can be deduced from this is that the participated companies do not use a sort of automatic program that aims to find disruptions, or that there are clear guidelines regarding what to be considered as a fault. Moreover, the employee is responsible for all actions made, and therefor also for all faults and deviations, henceforth, to find them as well.

To break overall goals, strategies and visions into specific strategies for each employee and to make employees feel responsible to uphold these, also known as policy deployment or hoshin kanri, is a much important and major point within organizations (Tennant & Roberts, 2001). These parameters are found under Pettersens (2009) group of characteristics named scientific management and are represented by assertion 25, “I have the authority to implement minor improvements that I feel are suitable”, assertion 26, “I see a clear connection between my work and the strategic/long term goals that are set for the organization”, assertion 27, “To work towards the corporate vision is my responsibility” and assertion 28, “The activities I do have an estimated execution time”. The first three assertions gives strong indications towards a well implemented hoshin kanri, many respondents stated to see a clear connection between the tasks given and the company’s vision, that they can implement minor suitable improvements and that they felt responsible to strive towards the corporate vision. However the last assertion did not get as strong indication, rather more of a scattered response, which indicates that the given activities do not always have an estimated execution time, which indeed gives the characteristics of scientific management three strong indications out of four possible.
5.1.1. Test of hypotheses

Hypothesis one assumed that;

\[
H1; \text{Scientific management characteristics will be found within the participating companies.}
\]

The results from the respondents turned out to give strong indication on three out of four possible parameters regarding scientific management, which gives an overall strong indication that these characteristics, especially hoshin kanri or policy deployment, are existing within the participated companies, hence, are hypothesis one believed to be correct.

Hypothesis two assumed that;

\[
H2; \text{Defects control characteristics will not be found within the participating companies.}
\]

As stated in the previous chapter all assertions connected with defects control did give a weak or scattered answer, which implies that characteristics of defects control cannot be found within the participated companies. Moreover, did the control assertion, “I am responsible for the quality of the operations I perform” give much strong indications to be true, with contributes to prove hypothesis two to be true.

5.2. Analysis of the survey formation

With a starting point from Jairaths et al (2000) view on the pilot study’s role in identifying potential roadblocks that needs to be dealt with before performing a full study, this survey have been designed to enable improvements in terms of language and understandability when analyzing the answers and notes from the respondents.

The language problem that Bryman (2012) discusses where some words can be hard to understand for some respondents is dealt with during the examination of the pre study. In the survey the authors have used a language that suited most people which showed in a high understandability in the actual study which only generated ten notes.

The study has followed Brymans (2012) view on how a cross-sectional research needs to collect quantitative data in a structured manner from different cases. By studying three different companies with a total of sixteen respondents where the data have been collected during a time period of two days.

In consensus with Dillmans et al (2009) and Brymans (2012) view on clear instructions on how to answer the survey and a clear structure, the authors designed the survey with
instructions that were easy to understand and follow according to the respondents of the pre
study. A clear structure of assertions and using only two different scales made it easy for the
respondent to answer the survey; this showed in the way that all respondents answered in the
same manner without any loss.

According to Trots (2012) view on questions with a focus on attitude the authors choose to
use a Likert scale for the assertions, this is something that worked well on most of the
assertions, however, some may have worked better if the respondent had been given the
option to answer a yes or no question. Even if Trost (2012) states that the respondents may
perceive this kind of question boring and thereby hurry through the survey without giving
honest answers, a couple of yes or no questions would have worked well in this survey which
will be discussed in the following chapter.

5.2.1. Suggestions for survey improvements
Based upon comments from respondents and a discussion within the team writing this thesis
some suggestions for improvements have been made, in order to improve the survey to its
maximum so that the research that this pilot study is laying ground to will obtain the best
possible survey. Suggestions will be presented not only as overall improvements but also
regarding specific assertions.

Firstly, one must consider the use of such strong assertions, with words such as continuous or
constant; “I am continuously aware of activities I do but do not add value for the customer”,
“My boss is continuously coaching me in my work”, “I work constantly with trying to shorten
the time it takes me to carry out my tasks”. These kinds of strong assertions have both a
positive and a negative side, when using them the respondents are forced to take a side, to
make a decision. The respondent can then choose to put a mark on either side when agreeing
or not agreeing or in the middle if agreeing slightly or not wanting to give a clear answer.
However, when not using such strong assertions, if the first exemplified assertion would be “I
am aware of activities I do but do not add value for the customer”, it will not give the
researcher an answer if the respondent thinks about these non-value adding activities on a
regular basis or just from time to time. Since lean is about having a fixed, structured
outline, method or ways of coping with things, one might find it interesting to get an answer to this.

Next, some assertions in the survey might not be of need of a Likers interval scale. Instead
some assertions might just need a yes or no box to fill in, which might make it easier for the
respondents to answer, such as assertion 33 “In my team, we put a work plan with planned
tasks for the next 2-4 week period”, and which might make it easier for the researcher to
interpret. When using a Likers scale on this assertion one can be of the thoughts that when
putting an answer on number 1, do not agree, “we always have a shorter planner period than
2-4 weeks, therefore I answer number one”, or perhaps than “no, we always have longer
planned periods so I do not agree with this assertion”. Therefore, when using this survey
again, one must consider which questions would be better to change from an interval Likerts
scale to yes or no assertions.
Moreover, can some assertions be considered to be unclear, or having to be reformed, which are as follows;

Assertion number three, “We have a fixed work pace that I follow”, which also got the most comments from respondents, need to be reformulated, since some respondents perceived it to be unclear. Therefore it will need to be reformulated, or to stay content with assertion number 28, “The activities I do have an estimated execution time”, which is intended to measure the almost the same parameters, although assertion number three is to do with employee and workload leveling.

Assertion five, “I am continuously aware of activities I do but do not add value for the customer”, might be perceived as an abnormal assertion difficult to give an answer to. This is again a question of interpretation, one can believe that employees might have a feeling if this assertion is true or not, but also that one not think about this on a regular basis and hence gets a bit perplexed.

Assertion number 27, “To work towards the corporate vision is my responsibility”, might be difficult to give an answer to if one is unsure about what the corporate vision actually consists of. Therefore this assertion might be in need of overlooking, one can however be of the thought that employees are supposed to know the corporate vision, but which do not necessary need to be the truth.

Finally, since no test methods regarding that the survey actually do measure what it is intended to, such as Cronbach’s alpha, could be done, as explained in the methodical chapter, another test might have to be made. One suggestion to verify this is to test the survey at a company, working in another sector, but that is known for having implemented lean throughout the whole organization, and to see how the respondents would interpret and answer to these assertions. Then, one can be certain that no misunderstandings should be made later on when conducting the research.
6. Conclusions

In this chapter the reader will be given a conclusion to the thesis’s purpose, based upon the results of the study, the answered research questions within the theoretical frame of reference chapter and the discussion of the previous analysis chapter. Reflections of the study will be given alongside with suggestions for future and upcoming research.

The first part of this thesis’s purpose was to identify the dispersion between lean and agile philosophies and methods of working within the Swedish textile industry. The overall answers given by the conducted survey was that lean do exist, within the organizational level of the participated companies, however in varied amounts and in various groups of characteristics, accordingly to how this thesis have chosen to describe lean. The most prominent group of characteristics found was scientific management, which got high agreeing answers on three out of four assertions. This was believed from the start to be the most widespread and most implemented part of lean, which was suggested in hypothesis one, which therefore indicates to be proven true.

Since the majority of the replies on the survey assertions were much scattered and dispersed, a conclusion or indication in any way is hard to draw. However on the other hand, can one deduce that since all answers not are negative to any assertions that lean is implemented, can one suggest that lean exists in various parts.

A conclusion regarding the agile parts of the survey can be, just as explained with lean, is that although much dispersed answers, are not all answers saying that they do not at all work in agility manners, which one then can deduce that agile philosophies and work-methods do also exist, in various parts and in various amounts.

The second part of this thesis’s purpose was to conduct, test and give suggestions for improving a survey that can be used in future an upcoming research. The survey have been tested various times, in a pre-study, under the actual study and then discussed with the aim to improve it further again. With all alterations discussed in the analysis part, one can believe that the survey will be able to fulfill its purpose in an upcoming research.

6.1. Reflections

It has been very interesting and highly motivating working with this type of study since we know that we will contribute to the academic world by conduction this pilot study. It has also been rewarding to immerse in a subject and area that at the moment lack research. What however feel a bit unsatisfying is knowing that this is just a pilot study and therefore cannot embrace the subject as deep as the main investigation will do.


6.2. Future research

Since this thesis is a pilot study that lay the ground for a forthcoming future research, one possible future research is to use the survey conducted in this thesis, with the suggestions for improvements altered, with a purpose likewise to the one used in this thesis, but with a much larger sample seize within the Swedish textile sector. With a larger sample seize can more conclusions be drawn than the indications made in this thesis, and hence, can one investigate which characteristics of lean and agile are the most prominent ones.

Another suggestion for future research is to conduct a research concerning solely the group of characteristics that were believed to be the most implemented one today, scientific management. Here, the researched could use in-depth interviews focusing on a smaller sample seize to investigate how scientific management characteristics are being implemented and used within Swedish textile companies today.

A third suggestion for future research is to undergo the same research as in this thesis, with the base in how Pettersen (2009) describes lean, with a widespread sample seize within the Swedish textile sector, but to use interviews with a few key personnel. Now, the researcher do not have to worry about however the respondents truly understands the assertions or questions, and can investigate more in-depth which parts of each group of characteristics that have been implemented and learn more about the companies thoughts and visions about lean and agile.
7. References


Appendix 1 Original survey in Swedish

Enkätundersökning angående arbetsmetoder och tankesätt inom svensk textilindustri


Tack på förhand!

Arbetsbefattning (Välj ett alternativ);

1. Varje projekt eller arbetsuppgift som jag arbetar med är kopplat till ett tydligt kundbehov eller verksamhetsbehov
Stämmer ej 1 2 3 4 5 6 7 Stämmer helt

2. Jag redovisar statusen för det projektet/projekten jag arbetar med löpande och avvikelser från plan på dessa är tydliga
Stämmer ej 1 2 3 4 5 6 7 Stämmer helt

3. Vi har bestämda arbetstempon som jag följer
Stämmer ej 1 2 3 4 5 6 7 Stämmer helt

4. I min arbetsgrupp arbetar vi med att jämna ut arbetsbelastning mellan teamets medlemmar på ett strukturerat sätt
Stämmer ej 1 2 3 4 5 6 7 Stämmer helt

5. Jag är kontinuerligt uppmärksam på aktiviteter jag gör men som inte tillför ett värde för kunden
Stämmer ej 1 2 3 4 5 6 7 Stämmer helt

6. Jag har en given struktur i mitt arbete där problem och brister blir tydliga
7. Jag arbetar kontinuerligt med att försöka korta ner tiden det tar mig att genomföra mina arbetsuppgifter
Stämmer ej 1 2 3 4 5 6 7 Stämmer helt

8. I min arbetsgrupp ifrågasätter vi våra arbetssätt för att ständigt identifiera förbättringar
Stämmer ej 1 2 3 4 5 6 7 Stämmer helt

9. Det finns ett schema för hur ofta jag ska gå på utbildning
Stämmer ej 1 2 3 4 5 6 7 Stämmer helt

10. I mitt arbetslag kan vi utföra varandras arbetsuppgifter
Stämmer ej 1 2 3 4 5 6 7 Stämmer helt

11. I min arbetsgrupp är alla delaktiga i arbetet med att beskriva arbetsmetoder och planera avdelningen
Stämmer ej 1 2 3 4 5 6 7 Stämmer helt

12. Min chef coachar mig kontinuerligt i mina arbetsuppgifter
Stämmer ej 1 2 3 4 5 6 7 Stämmer helt

13. Jag har möjligheten att bidra med förbättringsåtgärder
Stämmer ej 1 2 3 4 5 6 7 Stämmer helt

14. Jag anser att de förbättringsåtgärder jag föreslår blir uppmärksammade
Stämmer ej 1 2 3 4 5 6 7 Stämmer helt
15. Förbättringsförslag och idéer efterfrågas kontinuerligt av min chef

<table>
<thead>
<tr>
<th>Stämmer ej</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Stämmer helt</th>
</tr>
</thead>
</table>

16. I min arbetsgrupp har vi kontinuerliga möten för att adressera och diskutera förbättringar

<table>
<thead>
<tr>
<th>Stämmer ej</th>
<th>1</th>
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<th>3</th>
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<th>5</th>
<th>6</th>
<th>7</th>
<th>Stämmer helt</th>
</tr>
</thead>
</table>

17. Det finns tydliga regler och riktlinjer för vad jag ska betrakta som fel eller avvikelser i mitt arbete

<table>
<thead>
<tr>
<th>Stämmer ej</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Stämmer helt</th>
</tr>
</thead>
</table>

18. I de processer jag arbetar i har vi byggt in arbetssätt som förebygger att fel uppkommer i våra processer

<table>
<thead>
<tr>
<th>Stämmer ej</th>
<th>1</th>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Stämmer helt</th>
</tr>
</thead>
</table>

19. Jag är själv ansvarig för kvaliteten i de arbetsmoment jag utför

<table>
<thead>
<tr>
<th>Stämmer ej</th>
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<th>2</th>
<th>3</th>
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<th>5</th>
<th>6</th>
<th>7</th>
<th>Stämmer helt</th>
</tr>
</thead>
</table>

20. I min arbetsgrupp använder vi flödesscheman och processkartläggning som en naturlig del i arbetet

<table>
<thead>
<tr>
<th>Stämmer ej</th>
<th>1</th>
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<th>7</th>
<th>Stämmer helt</th>
</tr>
</thead>
</table>

21. På mitt företag involveras leverantörerna i projekt och förbättringsaktiviteter

<table>
<thead>
<tr>
<th>Stämmer ej</th>
<th>1</th>
<th>2</th>
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<th>6</th>
<th>7</th>
<th>Stämmer helt</th>
</tr>
</thead>
</table>

22. På företaget har vi våra arbetssätt tydligt beskrivna

<table>
<thead>
<tr>
<th>Stämmer ej</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<th>5</th>
<th>6</th>
<th>7</th>
<th>Stämmer helt</th>
</tr>
</thead>
</table>

23. Vi har tydliga beskrivningar för hur vi skall gå till väga vid olika situationer

<table>
<thead>
<tr>
<th>Stämmer ej</th>
<th>1</th>
<th>2</th>
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<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Stämmer helt</th>
</tr>
</thead>
</table>
24. Jag kan på ett enkelt sätt hitta och se status på aktiviteter och projekt som pågår inom verksamheten

Stämmer ej 1 2 3 4 5 6 7 Stämmer helt

25. Jag har auktoriteten att genomföra mindre förbättringsåtgärder som jag tycker är lämpade

Stämmer ej 1 2 3 4 5 6 7 Stämmer helt

26. Jag ser en tydlig koppling till mina arbetsuppgifter och de strategiska/långsiktiga målen som finns uppsatta för verksamheten

Stämmer ej 1 2 3 4 5 6 7 Stämmer helt

27. Att sträva mot företagets vision är mitt ansvar

Stämmer ej 1 2 3 4 5 6 7 Stämmer helt

28. De aktiviteter jag gör har en beräknad utförandetid

Stämmer ej 1 2 3 4 5 6 7 Stämmer helt

29. Vi har olika utarbetade tekniker för att säkerställa en god kvalitet inom de arbetsuppgifter som jag utför

Stämmer ej 1 2 3 4 5 6 7 Stämmer helt

30. Vi arbetar med bästa möjliga pris från våra leverantörer framför långvariga relationer

Stämmer ej 1 2 3 4 5 6 7 Stämmer helt

31. På företaget dokumenterar vi våra arbetssätt

Stämmer ej 1 2 3 4 5 6 7 Stämmer helt
32. I min arbetsgrupp har vi en tydlig dialog med vår/våra uppdragsgivare där tydliga mål och prioriteringar kommuniceras

Stämmer ej  1  2  3  4  5  6  7  Stämmer helt

33. I min arbetsgrupp lägger vi en arbetsplan med planerade arbetsuppgifter för kommande 2-4 veckors period

Stämmer ej  1  2  3  4  5  6  7  Stämmer helt

Övriga kommentarer: