Master Degree Project in Innovation and Industrial Management

Improving Supply Chain Efficiency in-store with a Lean Approach

A case study of Intersport Sweden AB

Robert Carlsson and Adam Gräsberg

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Abstract

Title:	Improving Supply Chain Efficiency in-store with a Lean Approach – A case study of Intersport Sweden AB
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With improved transportation and a more open market, supply chain management has evolved into becoming increasingly complex, resulting in longer supply chains and a need for operational excellence to stay competitive. Within the sector of retail this is further complicated by the demand for shorter product lifecycles and new products on a frequent basis to meet customer expectations. Although, the supply chain as a whole is important, the store itself crystallises as perhaps the most important part of the supply chain. Theory implies that the costs within the store itself constitutes for the major part of the total supply chain costs.

By investigating Intersport Sweden, a sports company in the Swedish retail sector, it has been shown that there are challenges and waste activities within the store contributing to current inefficiency. The purpose of this thesis has therefore served to identify waste activities and improve the efficiency within the retail stores of Intersport Sweden. To gather empirical material, a qualitative research approach has been chosen, where the authors visited twelve Intersport stores across Sweden and conducted interviews and observations. Since Lean philosophy aims to identify and eliminate waste, its tools and methods has been used together with the empirical material to ultimately be able to improve the process. Furthermore, this thesis adds an interesting theoretical contribution, seeing as theory concerning Lean and retail mainly has investigated the supply chain as a whole rather than investigated the store in depth.

The empirical findings reveal that there are plenty of room for improvements within the store and back-storage area. For instance, the stores operate differently in their day-to-day activities where certain best practices are displayed. In general, standardisation and structuring are needed and results have shown that additional lead time may arise due to a poorly conducted transition into the store itself. Our recommendations therefore include standardising routines (Kaizen), structure the back-storage area with a 5S approach, and implement Kanban squares to further smoothen the transition of products from back-storage to store. In addition, the thesis signifies trends and current literature that emphasize the promises of implementing technology such as RFID and to investigate potentials of outsourcing certain activities.

Acknowledgements

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Moreover, we are thankful towards all the interviewees of this study, who have generously shared their time, experience, and ideas with us. Also, a big thanks to our classmates who have provided feedback throughout the process, as well as interesting conversations during lunch hours.

"Continuous improvement is better than delayed perfection."
- Mark Twain (1835-1910)

Gothenburg, 2016-06-02

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1. Introduction

This chapter introduces a background of supply chain management in retail as well as the current situation in terms of challenges and characteristics. Moreover, findings from a pre-study investigating Intersport Sweden AB, conducted by the authors of this study, is presented and it is discussed how the company relates to current challenges. Lastly the chapter explains the purpose, research question and the delimitations of the thesis.

1.1 Background

In an increasingly global market, information is available and easily accessible for customers to choose products with the desired characteristics in terms of price, quality and delivery time. For companies it is therefore essential to strive for operational excellence within the supply chain in order to maintain competitiveness and meet increasingly demanding customer needs (Bruce & Daly, 2006). Accordingly, companies have, for instance, located their production sites to low wage countries such as China and Bangladesh in order to lower their production costs. The relocation of production sites resulting in prolonged supply chains has further made the supply chains more complex and challenging for companies (Kopplin, 2005). While looking at the retail industry, a factor that further complicates the supply chain is its characteristic of constantly shorter product lifecycles due to customers expecting constant change, and consequently new products available on a frequent basis (Bruce & Daly, 2006). Furthermore, due to globalisation, the retail industry is interacting with an increasing amount of suppliers who in their turn often relies upon another tier of suppliers to acquire the raw materials and products for their delivery. All in all, it creates a complex network across the supply chain that needs to be handled smoothly to ensure competitiveness (Kopplin, 2005). The retail industry itself further emphasizes the importance of efficiency as we today live in an era where competition within retailing is fiercer than ever, and competitors are constantly looking to enhance their performance to survive in an international environment (Corsten & Gruen, 2003).

While there are major implications in a global supply chain, there are also important aspects in a closer scope such as within the retail store itself. In a time when retailers find it increasingly hard to establish competitive advantages deriving from price, location and merchandise, the store itself becomes a useful tool in order to accomplish competitiveness. Millions of dollars are spent each year in designing and restructuring stores. It has been pointed out that there are uncertainties in how different aspects, such as store operations, service level and sales personnel influence performance (Baker, Grewal & Lewy, 1992). These aspects relate to efficiency, an important term within retailing that refers to how well the relationship between inputs and outputs are managed. While relevant differences between stores needs to be considered, efficiency should beneficially be identified and benchmarked for less efficient stores to implement. However, a distinction should be made between factors that the individual store may affect, versus the aspects it has no individual control over (Barr,

Cron, Slocum & Thomas, 1998). The efficiency of the in-store logistics is crucial since the availability on the shelf is a key indicator for buying behaviour and inventory costs. It is stated that handling costs and labour costs at this level plays a major part in the total supply chain costs (Kotzab & Teller, 2005).

As Intersport is one of the world's largest actors when it comes to sports within the retail industry, the company share many of the concerns mentioned above. It is a global company located with its stores all over the world and a complicated supply chain network with purchasing from external suppliers, as well as production of internal brands located in Asia. Moreover, Intersport Sweden AB (hereby referred to as only Intersport) operates with a wide range of store sizes all over Sweden, and these stores subsequently have different approaches of working across the company. Due to a recent centralisation, there is a need for new attempts to improve the ways of working and make the supply chain more efficient with focus upon the retail store.

1.2 Problem discussion

The retail industry is an attractive choice for researchers due to its challenges in terms of operations and inventory management throughout the supply chain. Lately however, it has emerged as even more interesting due to improvements in information technology and hyper competition within the industry, which as a consequence, has led to new innovations in supply chain management such as Vendor Managed Inventory (VMI) and Crossdocking (Agrawal & Smith, 2009). Additionally, advancements in information technology has allowed philosophies such as Lean retailing, meaning a set of business practices striving for efficiency and lower inventories while maintaining a flexible approach. The Lean philosophy urges the importance of moving the goods as quickly as possible throughout the supply chain up till the end location (Evans & Harrigan, 2005).

Although there are significant studies that investigate new innovations, it appears that there are few studies that cover the operations within a store in terms of daily work and indicators of in-store logistics performance (Bouzaabia, Van Riel & Semeijn, 2012). While Lean retailing cover most of the supply chain, there is less focus upon Lean within the actual retail store (Evans & Harrigan, 2005). Nonetheless, operational excellence within the store is of great need for companies striving to be successful. Even though conventional wisdom states the opposite, companies can find the opportunity of delivering high quality as well as low prices by operating efficiently (Berry, Seiders & Gresham, 1997). One of the factors concerns the labour. Although it is critical to accomplish sales, labour is one of the largest expenses for retailers and needs to be planned carefully (Agrawal & Smith, 2009). Costs are essential in this matter as it is typically easier to reduce costs in a small percentage and reach better profit equivalent to a much larger percentage of increase in sales (Myerson, 2014). Since Lean within retail is a relatively new subject, the studies on the matter are limited and are not focusing upon the store itself. Hence, this thesis may represent an interesting research contribution to the topic of Lean retail within stores.

The following graph by Van Zelst, Van Donselaar, Van Woensel, Broekmuelen, & Fransoo (2006) further underlines the statement that the operational efficiency within retail stores is an interesting as well as important matter to investigate in. While companies themselves might consider improvements at the distribution centre or transportation networks, the most significant logistics cost (38%) remains in the operations within the retail store itself (Van Zelst et al., 2006).
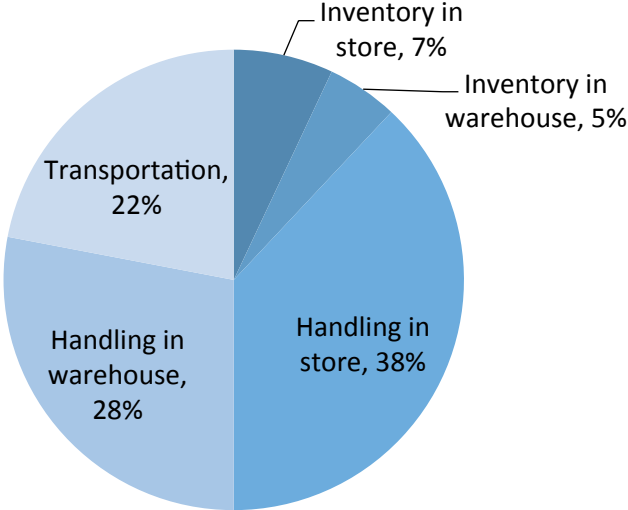
Figure 1: Operational logistics costs in retail supply chain, Source: Van Zelst et al. (2006)

In the perspective of Intersport, these issues discussed are highly essential. Intersport has currently around 150 retail stores functioning across Sweden, which results in a large organisation and a complex supply chain network. While there have been investigations and examinations in the operations of the distribution centre and the current transportation strategies, less has been conducted in terms of in-store efficiency. Although it has previously been hard to investigate these issues as the ownership has been decentralised, the new centralisation and ownership structure opens up for new possibilities when it comes to improvements and standardisation across the retail stores.

Considering Intersport, the logistics costs is well connected to the in-store lead time, as the longer it takes for the product to reach the store shelves results in additional tied up capital and loss of sales. A pre-study, conducted by the authors of this thesis, has shown that the past dispersed ownership and wide range of store sizes has resulted in the fact that the different stores operates in different ways when it comes to in-store operations. It is currently regarded by Intersport that more efficient approaches exists, and there is a concern that competitors may be operating more efficiently within the store and getting their products faster to the shelves. Hence, it becomes interesting to examine which aspects that affect the time it takes in the process of placing the product on the shelf and how the process can be improved and be made more efficient.

Furthermore, the conducted pre-study has shown that there are several aspects that affect the process of getting the product to the shelf. First off, it needs to be understood that there are differences depending on the product characteristics and above all, if the product is completely new, or whether it is a replenishing product as a consequence of goods being sold. A completely new product takes longer time, as room needs to be made for the products in the store, and there is a need for collaboration with the decorator to visualise the product. The replenishing product, on the other hand, may be sent out to the store directly and located together with the other products of similar kind. However, the different product types have basically the same in-store procedure in common. Initially the products need to be received from the delivery truck and registered into the inventory IT system. Moreover, the goods needs to be unpacked, located on a clothes hanger (if visualised as hanging in the store), attached to security tags and thereafter located somewhere in the store. These aspects differ widely between the stores, for instance whether these tasks are conducted at the back-storage by storage personnel or at the counter in the store itself by store personnel.

Results from the pre-study have shown that there are time consuming aspects within the areas of receiving delivery, handling of products and in the transition between the back-storage and the store. It is also clear that there are potential for reducing lead time by operational improvements and reduction of waste activities. Regarding these aspects, Lean crystallises as a suitable philosophy to apply considering its tools and methods to reduce waste and continuously improve the process. Hence, in our case study, we will focus on improving the supply chain efficiency within Intersport's retail stores using Lean.

1.3 Purpose

This thesis aims to investigate supply chain efficiency within retail stores operated by Intersport, as well as evaluate potential aspects of improving the process from a Lean perspective.

1.4 Research question

How can Intersport improve their supply chain efficiency at the physical stores?

The research question will be answered by identifying challenges and potential improvements in the in-store operations. As such, a Lean approach will be used due to its suitable tools and methods for identifying waste, allowing for the development of recommendations to make the process more efficient.

1.5 Delimitations

In order to allow more depth in the thesis, certain limitations have been conducted. The thesis is a case study, meaning our focus is upon Intersport and its situation within supply chain management, although some findings may represent the retail industry in general. Moreover, even though Intersport is a global company, our thesis will only represent the situation of Intersport in Sweden specifically. As our focus is upon the retail store, our study will only be

demonstrating the part in the supply chain from where the goods arrive at the retail store until the products are located upon the shelves in the store.

Furthermore, Intersport has three order categories in their supply chain: replenishment orders, new orders, and team orders. As delimitation we will focus on one of these order categories, namely replenishment orders. We find that replenishment orders represent the majority of the goods that are being delivered at the stores, and by focusing on one category we can more easily compare empirical data gathered at different stores. Consequently, we will get a deeper understanding of the process and be able to go more in depth of the handling of products.

Lastly, we acknowledge the limitation of implementation. This thesis is not concerned with carrying out or implementing future improvements, but merely to come up with suggestions as to what is recommended. Therefore, a limitation of this thesis is that we cannot assure that our constituent will in fact make practice out of theory and implement recommendations stated here.

1.6 Research outline

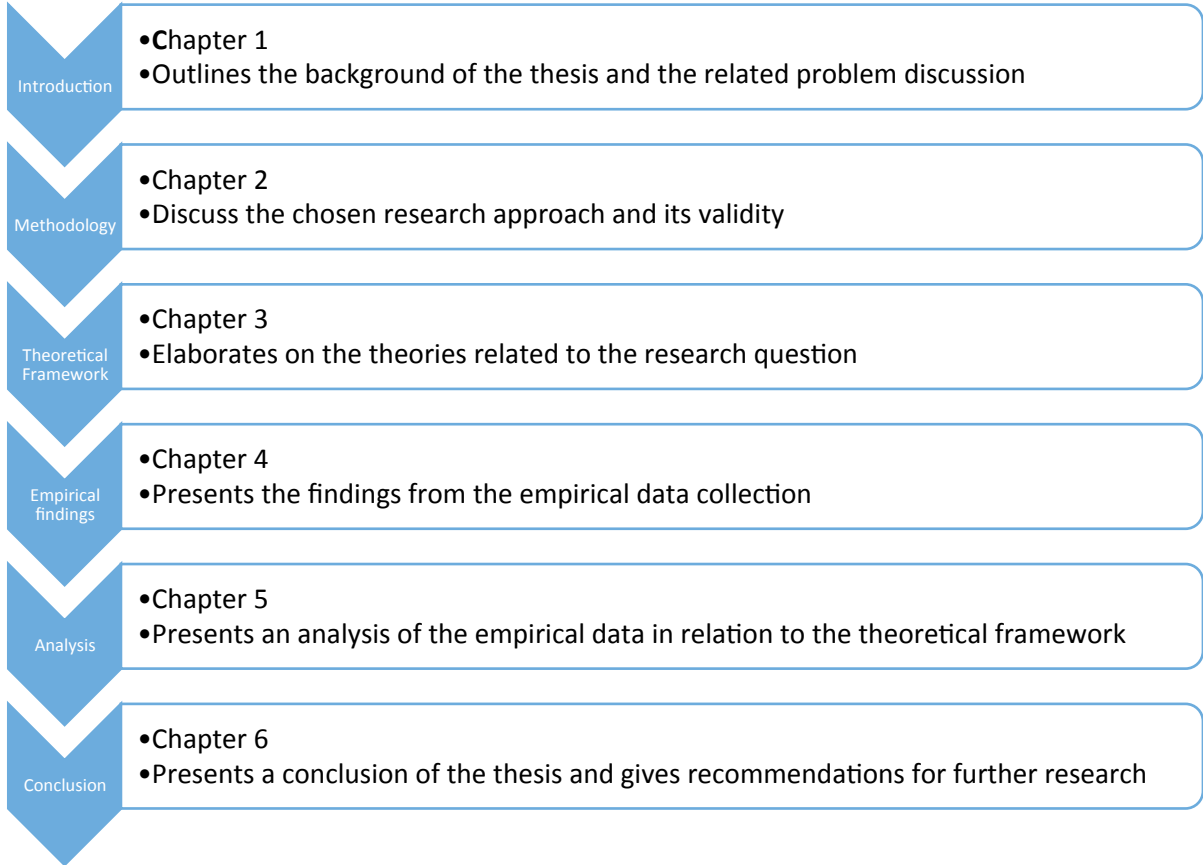| Introduction	•**C**hapter 1 •Outlines the background of the thesis and the related problem discussion
Methodology	•Chapter 2 •Discuss the chosen research approach and its validity
Theoretical Framework	•Chapter 3 •Elaborates on the theories related to the research question
Empirical findings	•Chapter 4 •Presents the findings from the empirical data collection
Analysis	•Chapter 5 •Presents an analysis of the empirical data in relation to the theoretical framework
Conclusion	•Chapter 6 •Presents a conclusion of the thesis and gives recommendations for further research

Figure 2: Research outline, Source: Own developed model

2. Methodology

The following chapter contains an overview of our research approach, including a description and motivation for our choice of method. Furthermore, it explains in detail the structure of our empirical gathering and how we assured credibility and validity throughout our study.

2.1 Research approach

In line with the current situation presented in the introduction, we have laid out a plan as how to approach the problem. According to Esaiasson, Gilljam, Oscarsson, & Wängnerud, (2012), the choice of research approach lies in the nature of the problem, and generally by having a wide array of methods one will touch upon the matter most thoroughly. Seeing as the actual subject of this thesis is defined by a number of physical sport stores, and the goal is to find further insights about these, a combination of descriptive and explanatory studies are well suited. Our research can be considered descriptive because we want to expand upon trends and themes already discovered in the pre-study, and it can be viewed as explanatory as we seek to derive a detailed understanding of a particular case and phenomenon (Bryman & Bell, 2011). Furthermore, the methods of descriptive and explanatory studies are applied to answer inquires like *where*, *when*, and *how* (Esaiasson et al., 2012).

The comprehensive approach of research method can be reflected in two opposites: positivism and hermeneutics. Positivism, which has its roots in the natural science, seeks to confirm and verify theories through observations and measurements. For a theory to be scientifically viable, it has to be verified empirically. Thus, according to positivism, emotions and values and other notions that cannot be weighed or measured are not considered relevant. On the opposite side we have the hermeneutics. This scientific approach is often described to be using interpretations with the goal of getting a deep understanding of different phenomena. The qualitative nature of hermeneutics gives room for subjective and engaging research. (Patel & Davidsson, 2011)

Seeing as our intention with this thesis has been to gather further knowledge of certain phenomena, we have chosen to reject positivism. However, we do not consider hermeneutics in its full to reflect our research approach; therefore we have adapted an interpretive outlook as a complement. Moreover, we have strived to acquire a thorough comprehension of the research area by conducting data collection based on interviews and observations. This approach led us to be able to connect empirical data with accepted and well-known theories on the subject.

2.2 Research design

According to the literature presented by Patel & Davidsson (2011), there are three approaches to analyse empirical data from a theoretical perspective: induction, deduction, and abduction.

We have chosen to work from an abductive approach, hence combining induction and deduction in our methodology (Ghauri, 2004). We started by establishing a theoretical framework with accepted and relevant theories. We gathered data with the help of qualitative interviews and observations, and then returned to theory to adapt it to the empirical data collected. By way of doing this we could see from a deductive approach what factors gave meaning to the context, and at the same time were able to gather as much knowledge as possible (Esaiasson et al., 2012). Returning to the theoretical framework, after acquiring a more profound understanding through qualitative interviews, is all part of our abductive approach (Ghauri, 2004). The foremost advantages with an abductive approach are that the researcher acquires an open mind to the empirical data, whilst the research still keeps a clear connection to relevant theories (Patel & Davidsson, 2011).

For this report a qualitative research approach has been seen most preferable. It can be motivated by the fact that its opposite, the quantitative approach, cannot generate the same deep understanding which are sought after. Moreover, the qualitative approach opens up for discussion between subject and researcher and it give room to revise and correct the framework in real-time, as well as ask follow-up questions, thus ensuring the empirical materials relevance for answering the research question (Holme, Solvang & Nilsson, 1997).

Following a qualitative approach, there are several different ways of conducting research. Included here are interviews and observations, which furthermore are considered vital methods for data collection. We have hence chosen to conduct our qualitative research with interviews and observations contributing to the bulk of empirical data gathering. The following sections will give a description of the methods used in terms of collecting data for this thesis.

2.2.1 Case study

A case study is applicable when you want to describe or get a better understanding of a specific situation, such as phenomena in a smaller society or in an organisation. A case study research is thus concerned with the complexity and particular nature of the case in question (Bryman & Bell, 2011). According to Yin (2009), a case study is best suited when the research aspires to understand *how* and *why* a phenomenon takes place. Moreover, a case study describes real occurrences, which accordingly gives the researcher a deeper knowledge of the origin and lapse of a certain event.

This thesis is concerned with investigating supply chain efficiency at physical retail stores, thus the thesis is concerned with investigating a situation deriving from a specific organisation and its processes. Consequently, the task motivates the choice of using a case study as a research method. We also deem it important that the result of the study is clearly connected to reality, which we believe is best done through a case study. In addition, this approach gives us the possibility to compare relevant theory with practice and to draw conclusions from this.

2.2.2 Interviews

As mentioned above, in a qualitative research approach interviews can be used as a method to collect empirical data. The following sub-categories of interview methods can be applied: structured, unstructured, or semi-structured. Choosing between these is of great importance for the shaping of the interview guide as well as for the degree of freedom the respondents will have to interpret and answer the questions (Patel & Davidsson, 2011).

Seeing as the purpose of this study has been to get a deeper understanding and find ways of improving a certain occurrence, a semi-structured interview method have been deemed most appropriate. This interview method is based on a predetermined interview guide with certain topics to be covered, but at the same time enough open ended so it can enable the respondents to freely share all information they consider important (Bryman & Bell, 2011). In addition, this more open interview method gives room for interaction with the interviewee, and helps the researcher more clearly shine a light on a certain phenomena in the organisation.

Moreover, the deeper insights gained from qualitative interviews can later be used to manifest patterns in the respondents answers (Esaiasson et al., 2012). In this case, patterns could be in the shape of central factors or best practices in the process of handling the products from delivery until reaching the shelves. Consequently, as a way to create comparable results it is up to the researcher to develop an interview guide so the respondents answer somewhat similar questions. The interview guide was developed to touch upon some specific areas[1], which would enhance the possibility to interpret patterns in the empirical data and to enable the finding of best practices and improvements. Furthermore, a semi-structured approach made it possible for us to clarify any ambiguities in the questionnaire, as well as ask additional questions if we wished the respondent to illuminate on a certain subject. Conclusively, we believe the semi-structured approach opened up for a greater depth to be reflected in the empirical material.

2.2.3 Observations

In addition to conducting qualitative interviews, observations of the subject in matter are a well used complement. What is beneficial about observations is that the researchers themselves are gathering the empirical information, thus reducing the need for relying on third party retellings (Esaiasson et al., 2012). Consequently, observations are suitable for studying processes where it is useful to get a general understanding of the practice, in our case how the product is handled before arriving on the shelf.

Furthermore, according to Esaiasson et al. (2012), observations are especially beneficial when there is a suspicion of discrepancy between what is being said and what is actually being done. Therefore, we find it necessary to conduct thorough observations to see the process for ourselves, because if discrepancy would exist it could seriously affect our study. However, we believe any eventual deviation would be the result of unintentional influence of external factors, such as stress and habits, and not a will to intentionally tweak the result.

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[1] See appendix section 8.2 for an Interview guide

Seeing as we want to examine potential areas of improvement in the process of handling the products from delivery to arriving on the shelves, we find it of outmost importance to examine the procedures on sight ourselves. In addition, we believe the process might be affected by the interaction of the personnel at the stores, which is a factor hard to measure by only conducting interviews. As Bryman & Bell (2011) states, observations can give an understanding of the social context and behaviour of the people involved. Thus, conducting observations have mainly been about getting an understanding of the process and the social context our respondents are part of, but also to be able to identify potential best practices that might be overlooked by our respondents because of lacking theoretical knowledge. As such, the observations will not be presented separately in the empirical material, but instead act as supporting information to the collected data.

2.2.4 Benchmark

As a complement to above mentioned data collection methods, we conducted a benchmark of actors within the retail industry, through desk research. To be able to analyse best practices at Intersport's stores we found it beneficial to draw knowledge from other Lean examples within retail when it comes to internal supply chain.

There are basically two types of desk research techniques: internal desk research and external desk research. As the goal for our benchmark was to collect data related to actors within the retail industry, we conducted an external desk research. The best approach for collecting external data as a benchmark would be to gather it directly at the source, meaning conducting interviews and observations on site. However, seeing as we in this case are representatives of Intersport it was difficult to get access to potential competitors' in-store logistics. In addition, seeing as we only aimed to draw conclusions from already conducted scientific research we chose to conduct an online desk research with the justification that there is incredible amount of data available online and we could leverage our experience of data gathering to extract relevant information. The desk research were conducted using various search engines, such as Google, Scopus, Emerald, Web of science, PubMed, and Retriever Business. Furthermore, we scanned through relevant research reports, articles and theses looking for promising subjects to benchmark with.

This benchmark has been added as a case example to the theoretical framework instead of to the empirical material. This is because the benchmark is concluded from scientific and academic articles with which we drew conclusions from, and thus we did not conduct any new research ourselves.

2.3 Selection of cases

According to Yin (2009), one of the most crucial elements of a case study is the selection of cases to study. If there is any obscurity as to why these particular cases are being studied, the whole significance of the thesis might be in jeopardy (Yin, 2009). Furthermore, the selection of cases is a significant factor that will affect to what extent our research questions can be verified. Consequently, it becomes crucial to have a well-defined research question and to

clearly specify the information needed to answer said question (Bryman & Bell, 2011). This thesis has a focus on the supply chain efficiency at Intersport, and in particular a number of chosen stores. In line with studying the in-store supply chain of Intersport, to gain insights as what is being done and how to improve it, we have chosen to investigate physical stores that together can form a general perspective for all of Intersport's stores. Thus, the selection of cases to study was done together with representatives from Intersport. Drawing from their practical experience and knowledge we could pick a number of stores to investigate, each distinctive in terms of geographical location, operational structure, size and turnover. We wish to gather empirical findings from several stores to be able to compile that into a statistical example of a generalised Intersport store. We will then strive to evolve this generalised example into one made out of best practices gathered from comparing empirical research of practice with relevant theory.

As a result we came up with twelve stores with a geographical spread ranging from Gothenburg in the west, Malmö in the south, Stockholm in the east, and to Skellefteå in the north.

2.3.1 Selection of respondents

The possibility to select respondents with the right knowledge increases when the researchers understand what information they are looking for (Bryman & Bell, 2011). Seeing as this thesis intends to look into the supply chain at Intersport stores, including the collaboration between back-storage and in-store operations, the information we are looking for can best be retrieved from interviewing back-storage and store personnel. The employees working in the back-storage area have full control of the operations, processes, and work tasks that are needed to structure the receiving of delivery and handling of goods. In addition, the in-store personnel take care of the transition of products from the back-storage area into the store spaces, and thus have an understanding of the processes valuable to the research of this thesis. By collecting empirical data from both of these employee categories at each store, it will be possible to identify eventual discrepancies as well as patterns in how stores operate. Furthermore, it is vital to take into consideration the combined knowledge of back-storage and in-store personnel to be able to get a full picture of the daily operations.

2.4 Data collection

2.4.1 Conducting of interviews

According to Holme et al. (1997), to be able to gather relevant data from an interview situation, it is required that the researcher is familiar with the problem area and is in understanding of the reality of the respondent. For this reason, it was considered of outmost importance to become familiar with the daily activities of the respondents before conducting empirical interviews. Thus, a pre-study was performed where the authors looked into the operations of Intersport including the special functions involved in the internal supply chain, such as the processes at the distribution centre. In addition, a dialogue was held with key staff at Intersport's Sweden headquarters in Gothenburg to gain further understanding of the operations.

For the collecting of empirical data, the interviews were mainly conducted in person, where the authors of this thesis travelled to each store to meet up with the respondents and at the same time perform observations. In addition, two interviews were conducted over the phone because of geographical limitations in regards to the time it would take to travel to these locations. As a complement, it was in some cases necessary to conduct telephone interviews with already interviewed stores as a way to clarify certain questions. The respondents had beforehand, at the time of the interview, been asked if it was OK for them if we post-interviews called up to ask clarifying questions. This was a measure taken to be able to make sure the most complete picture was painted.

To create a natural and comfortable environment for the respondents, we let them propose a suitable location for conducting the interview. By finding the most relaxed environment for the respondents, we aim to get them to speak freely of their experiences and suggestions for improvement. Thus, the interviews were held in the stores lunchroom or back-storage offices, where the respondent could feel at home, undisturbed, and unsupervised. Furthermore, we presented the reason for this thesis and stressed anonymity as a way to create trust between authors and respondents.

Both authors were present during all the interviews. One was in charge of leading the interview according to the interview guide, whilst the other took notes. A clear division of responsibility facilitates the collection of data and the quality of the same. In addition, the interviews were recorded, and thereafter transcribed, to further facilitate that the empirical data was correctly received and presented.

2.4.2 Conducting of observations

As mentioned above, conducting observations have mainly been about getting an understanding of the process and the social context our respondents are part of, as well as be able to identify potential best practices that might be overlooked by our respondents because of lacking theoretical knowledge. As such, the conducting of observations is a valued complement to performing interviews. Furthermore, observations grants the ability to investigate any eventual discrepancy between what is being said and what is actually being done.

In the pre-study, observations were focused on overseeing the process of receiving and handling the goods back-storage. However, in the following empirical gathering, observations were mainly about observing the whole process of getting the product from the loading dock at the back-storage area to transitioning into the store spaces and then being visualised on the shelves. Bryman & Bell (2011) stresses the importance of minimal interference by the researcher. Thus, observations, both in the pre-study as well as in the later stages, made sure to have a passive approach, meaning it was important to not intervene in their processes but instead to only observe and take notes. One of the first things that were stated when meeting with the respondents was hence to point out that the purpose of the thesis was to map out the work process as a whole and not the individual personnel's efficiency.

Both authors were present during all the observations, and both authors were equally responsible for taking on-going notes. However, the taking of notes were intentionally minimized and held as discreetly as possible to avoid making the observed personnel feel supervised. Focus has been to attend and observe, and thereafter more thoroughly discuss and take notes.

2.4.3 Secondary data

To get an overall understanding of the subject of this thesis, gathering of secondary data has been a big part. This was foremost done in the beginning of the thesis process as a way to build a solid foundation of knowledge through which a more detailed analysis can be done. Secondary data in the form of literature, academic articles, scientific reports and theses have systematically been collected from well-known databases like Emerald, Scopus, Web of science, PubMed and Google Scholar. In the process of searching for information, certain key words were used, such as "Lean", "Lean retail", "in-store", "in-store logistics", "in-store supply chain", and "retail efficiency".

2.5 Empirical gathering and validity

Three of the most noticeable criteria for the evaluation of business and management research are reliability, replication, and validity (Bryman & Bell, 2011). Reliability is concerned with the question of whether the results of the study are repeatable, and moreover able to be generalised. Replication is in turn closely related to reliability, as it concerns replication of the findings of others. The third criterion of research is validity, and it is concerned with the integrity of the conclusions that are generated from the research (Bryman & Bell, 2011), as well as making sure the study is free from systematic errors and seeing that what is said to be measured actually is measured (Esaiasson et al., 2012). According to Esaiasson et al. (2012) and Bryman & Bell (2011), validity is in many ways the most important criterion of research, and it is through achieving validity the most credible conclusions can be generated from the empirical material. Moreover, seeing as a qualitative research approach has been seen most preferable for this study, the discussion of reliability and replication are of less relevance. As Bryman & Bell (2011) puts it, there are some difficulties with replicating the social processes that arise in a qualitative context.

At the point of empirical gathering, and especially through interviews, one critical factor could be that the researcher understands a situation incorrectly and thus misinterpret the information given by the respondent. This will in turn affect the collection of empirical data and the conclusions generated (Holme et al., 1997). As a way to reduce the risk of misinterpretations, we the authors of this study have thoroughly gone through the interview guide and answers given from this, as well as discussed each interview in detail. Furthermore, we conducted complementary interviews over the phone whenever the slightest confusion arose in what an answer entailed. In addition, the semi-structured approach that we chose to follow enabled us to revise and correct any question at the time of interviewing to better adopt to the situation. Also, the fact that both of us attended each interview further minimized the risk, and helped strengthening the validity.

The selection of respondents is of vital importance for ensuring the validity of the research. According to Patel & Davidsson (2011), researchers should choose respondents with different backgrounds and with different experiences to be able to best interpret variations and thus increase validity. Hence, the selection of respondents for this thesis has transpired strategically through preferring personnel with mixed experiences together with great knowledge of the process. Furthermore, we decided to interview both back-storage personnel and store personnel at each store, seeing as common ground is needed to be able to make comparisons of the work that transpires at each store as well as open up for finding variations or correlations. In addition, it opens up for finding cross-border aspects such as own initiatives that can be transferred or prospective success factors. Moreover, by interviewing back-storage and in-store personnel both, the empirical data considers more than one point of view, and thus decreases the chance of validity issues through respondents' self-interest (Esaiasson et al., 2012).

Additionally, by complementing the empirical gathering with on site observations we were able to safeguard against the so-called interview effect, which refers to the influence an interviewers presence has on the interviewee's statements and will to give a correct picture (Bryman & Bell, 2011). It does not mean the respondents intentionally give false statements, but instead means it is possible the effect of feeling supervised might lead to unintentional beautifying of testimonies. Observing the actual work give us the picture to compare what is being said with what is truly being done.

Lastly, we find it important to emphasize the value of critically reviewing the sources used for the theoretical framework. The subject of Lean has for long now been of interest for academics and management researchers, and the more specified subject of Lean in retail is quite contemporary to this time and thus there is a lot of literature written. Consequently, secondary data has been of primary concern for us to build a complete picture, and in this academic articles, books, and business reports have constituted the bulk of information. When assessing this information we have made sure to critically review the source they derive from and made sure to avoid any subjective interests from the author. However, the predominant part of the theoretical sources used is derived from academic or scientific literature, which increases the validity and credibility.

2.6 Analytical model

Through conducting a pre-study, we could early on gather data for constructing a visualisation of the in-store supply chain process. We came up with three areas in which the process could be divided: receiving delivery, handling of goods back-storage, and transition back-storage to store. By early on making this distinction of the in-store logistics into three parts, an analytical model could be developed in order to simplify the analytical process and enhance the understanding of the theoretical framework.

The analytical model corresponds all through the empirical findings, analysis, and conclusion, and each part is linking back to literature presented in the theoretical framework. Accordingly, the empirical findings have been presented to reflect the three parts (receiving delivery,

handling of goods back-storage, and transition back-storage to store) and each section is touching upon relevant theories and tools brought up in the theoretical framework. Furthermore, the analysis have been structured in alignment with the empirical findings, and as such the analytical model will help to more easily identify the similarities and differences with regard to our findings and the theoretical framework. As Bryman & Bell (2011) states, it is through this process we can draw the conclusions necessary to discuss and answer our research question. Moreover, by combining and re-establishing the theoretical framework throughout the process, by the abductive approach presented in the previous section, we will reach a higher level of validity (Ghauri, 2004). In addition, each section is complemented with a part concerning general findings, which are not directly part of the in-store supply chain, but in high regards affect the activities within.

3. Theoretical Framework

The following chapter elaborates on the theories related to the research question, as well as presents the theoretical framework that constitutes this thesis. Literature in the field of supply chain management and in-store logistics is introduced, displaying emphasises on the retail industry, further exemplified by a short case benchmark. Moreover, the Lean philosophy is presented together with different tools most commonly used within Lean in retail.

3.1 Theoretical introduction

3.1.1 Retail

There is little human behaviour that may vary as much in subjective purpose as shopping. While retailing refers to the activity of selling goods or services to consumers to earn profit, there are several different underlying causes that are important to have in mind when trying to understand retailing and customer experiences. The goals of the consumers may vary widely, for instance, they may have the objective of entertainment, recreation, social interaction or intellectual stimulation. Hence, a retailer needs to align the retail environment to such aspects, although it is not a simple task, since the same retail environment may generate different outcomes depending on specific customer's goals. It is clear however, that a greater understanding of customers can improve the chances and enhance the retail performance (Puccinelli, Goodstein, Grewal, Price, Raghubir & Stewart, 2009). A study by Bäckström & Johansson (2006) shows that what is thought to be important in-store experiences differ between the customers and the retailers themselves. The actors included in the Swedish retail sector homogenously urged for a focus upon an increase of technological solutions and design elements. The customers however, rather identified and strived for plain aspects such as layout, price, selection and expertise of store personnel. The results indicate that retailers generally ought to focus more upon the traditional values first (Bäckström & Johansson, 2006). Literature findings agree on how important the retail environment is when it comes to supporting and ensuring that the products are available for the customers at the end of the supply chain (Barnes & Lea-Greenwood, 2010). However, efficient retailing concerns more than the store environment. While the fashion retail has previously been characterised mainly with a "push" strategy, including longer product cycles and lead times, the opposite has now emerged due to shorter product life cycles and fluctuations in demand. These facts result in new fiercer requirements to deal with efficient in-store operations as well as a smooth supply of products (Hayes & Jones, 2006).

3.1.2 Supply chain management in Retail

Many authors have tried to define supply chain management (SCM), and although the definitions are somewhat similar, one of the most basic ones will be referred to in this thesis; "a total system approach to managing the flow of information, materials and services from raw material suppliers through factories and warehouses to the end customer" (Jacobs & Chase, 2014). Despite the concept of a supply chain being as old as production and sales

itself, the term supply chain management was not expressed until much later. One of the earliest to convey the term was Jones & Riley (1985) who stated that; "SCM deals with the total flow of materials from suppliers to end users". Since then, the term has developed and become one of the most popular concepts of improving performance in organisations. Supply chain management is a term up to date with a global world, as it refers to the interactions, not only internal, but a network of multiple businesses and relationships. This advancement within supply chain management has led to a difference in terms of competition. Rather than brands competing against brands, or stores versus stores, it is currently supplier, brand and stores together competing against other opponents of same sort, explicitly supply chain versus supply chain (Lambert & Cooper, 2000).

Due to an increasingly volatile demand and shorter product lifecycle within retailing, challenges exists in terms of forecasting across the supply chain. In that aspect, real-time data is important and increasingly being used to tackle current demand. For real-time data to be of accurate use, there is an underlying need to shorten lead times, and accordingly increase responsiveness to fluctuations in demand. A shortening of lead times thereby minimize the risk of forecast errors, and increase the chance of offering products when they are attractive, rather than in the shape of discounted stock resulting in less profit (Hayes & Jones, 2006). A popular term within the subject is the concept "fast fashion" which concerns shortening the lead time throughout the supply chain and accordingly reach the end consumer faster. Retailers may do so beneficially by conducting in-season buying to make sure product ranges are constantly updated. Moreover, fast fashion urges the importance of a demand driven approach, "pull", in order to satisfy consumer demand at its peak (Barnes & Lea-Greenwood, 2010). Research by Hayes & Jones (2006) further supports that applying a fast fashion model with short lead times has a positive impact on stock turnover. Thus, it decreases the average number of days the stock remains in-store, which consequently reduce inventory costs and the need of discounts (Hayes & Jones, 2006).

3.2 In-store logistics

Existing literature is largely resting on supply chain operations outside the store environment, thereby focusing more upon distribution centres and the linking with suppliers (Bouzaabia et al., 2012). However, Van Zelst et al. (2006) state that the in-store costs are outnumbering the costs of other parts of the supply chain and as seen in *Figure 4*, Evans & Mason (2015) confirms that the last 50 meters represents the largest expense in Tesco's whole supply chain. Hence, in-store logistics that focuses on the handling, arranging, and ordering within the store plays an essential part. Poor in-store logistics is often expressed through shelf stock-outs, meaning stock-outs that occur even though there are adequate stock at the location, although not located on the shelf and available to the customers. This occurrence is often a result of retailers having more than one location of inventory (Bouzaabia et al., 2012).

Some measures that are essential to deal with this problem, and manageable within the store itself are; training and motivating staff, accurate inventory information, improving packaging design, organisation of the back-storage, and exploiting RFID technology (Mckinnon, Mendes & Nabateh, 2007; Bouzaabia et al., 2012). The training and motivation of the staff are key

factors, due to the necessity of regularly checking the availability and conducting replenishing. Furthermore, accurate inventory is essential as it determines the replenishment, otherwise there will be a mismatch of products resulting in items being out of stock. Accordingly, items might be available electronically in the inventory IT system but not in practice, due to inaccurate information. Moreover, the nature of packaging may be of importance as it can make replenishing more identifiable, for instance by colour coding allowing prioritization of packaging. This is in line with organising the back-storage, since products tend to occur in mixed loads from the distribution centre and therefore needs to be resorted. This additional handling complicates the replenishing and consequently needs to be structured as far as possible. Further, it is beneficial to implement RFID within the in-store operations as it increase visibility, identifies inventory and reduce shrinkage (Mckinnon et al., 2007). Although some might question the whole function of a store in today's increasingly e-commerce driven business, Aubrey & Judge (2012) describes how it is rather an opportunity to re-invent the physical store to prosper growth. Rather than seeing e-commerce as a threat, it is sufficient to have a store network that works alongside and support each other as the stores may drive consumer preference and market the brand. Accordingly, it is essential to be innovative in today's store function and setup, in order to face the future challenges of the retail market (Aubrey & Judge, 2012).

3.3 Lean

The terminology Lean was originated in the Japanese company Toyota and its successful attempts of Lean Manufacturing in the 1940s. The idea by Toyota was to produce in a continuous flow and not rely on long production schedules to operate efficiently. Along with the continuous flow, they considered that only a fraction of the total production process added value to the end customers, which they accordingly focused on. Although, the concept Lean was originated as Lean manufacturing in the automotive industry, it has since then been spread and shown that it can be successfully applied across various areas and industries (Melton, 2005). As stated by Womack & Jones (1996), the concept Lean should be interpreted as a way of thinking rather than a concept forged to the automotive manufacturing. Hence, a common definition states that the Lean concept refers to; "a philosophy that when implemented reduces the time from customer order to delivery by eliminating sources of waste in the production flow" (Liker, 1997).

The Japanese word *Muda*, referring to waste, is a central word in Lean thinking. In these circumstances waste considers activities that absorbs resources but creates no additional value. Such activities can be, for instance; mistakes that needs to be modified, bottlenecks, processing phases that are unnecessary, and movements of employees and goods without any specific purpose. Lean thinking serves to oppose these non-value adding activities by conducting processes in the best sequences and perform them more effectively. In short, Lean strives to accomplish more while using fewer resources in terms of time, material and human effort (Womack & Jones, 1996). Hines, Holweg & Rich (2004) confirms, but adds that it is important to acknowledge, when identifying waste, that it is the waste from the customers' point of view and enhancing customer value that needs to be appointed. Otherwise there is a risk that the company focuses too much on cutting costs rather than enhancing value (Hines et

al., 2004). Apart from Muda, it is essential to acknowledge the importance of *Mura*, meaning the variability in the flow, and *Muri*, referring to overburden in the process. These terms are intertwined in the Lean concept and they should all be mitigated in order to improve efficiency (Hines, Found, Griffiths & Harrison, 2008).

3.3.1 House of Lean

In order to understand the whole picture of Lean, the management of Toyota illustrated the principles of Lean in a figure representing a house. The House of Lean, also called House TPS, aims to give an understanding that the house represents a structural system which requires the different parts to work together in order to be effective (Liker, 2009).
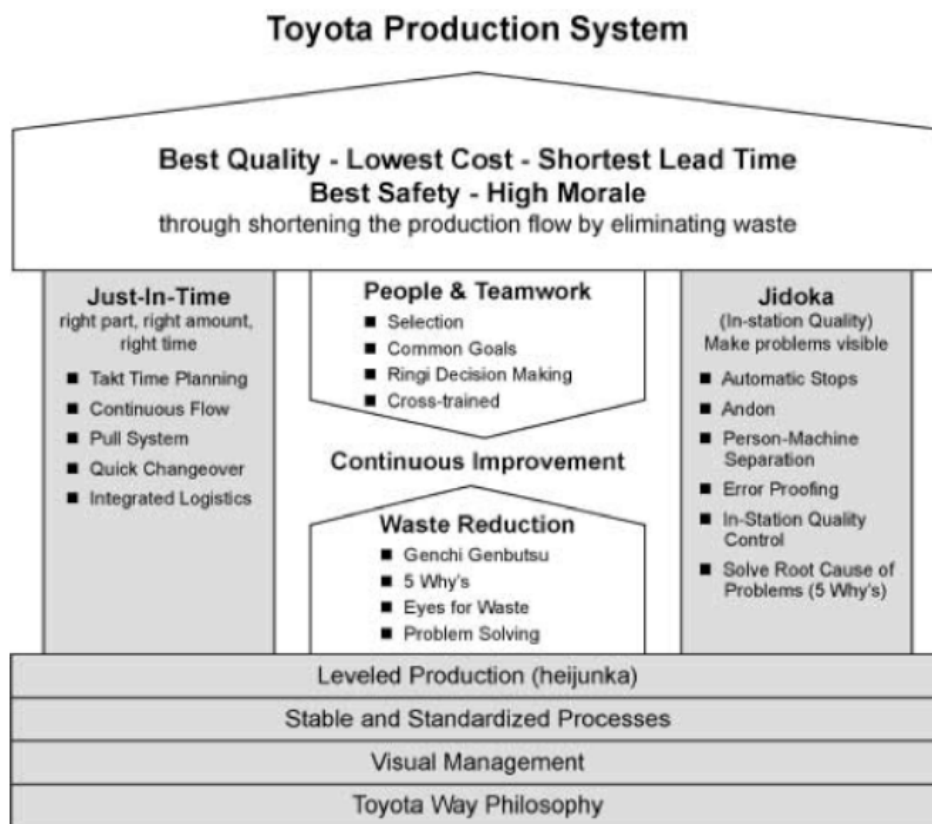
Figure 3: House of Lean, the Toyota Production System, Source: Liker (2009)

The top describes the objectives of Lean and its values. By shortening the flow and eliminate waste, Lean will improve the quality, costs, lead times, safety and consequently the morale of the employees. The house rests on two pillars. The pillar Just-In-Time (JIT) refers to appointing the right product, to the right place at the right time. An implementation of JIT aims to eliminate unnecessary inventory, idle time and improve the overall flow (Liker, 2009). The second pillar is *Jidoka*, quality management, which assures quality throughout the chain. Jidoka intends to implement quality thinking through the whole flow where employees together works to ensure the quality of the end product or service (Slack, Chambers & Johnston, 2010). Lastly, the foundation of the house is represented by *Heijunka*, which strives to level out the flow and making it continuous rather than fluctuating. Thereby the process

becomes stabile and standardised across the chain (Liu, 2009). These standardisations should beneficially be conducted on a basis of best practices and thereby avoid as much variation as possible (Myerson, 2014). Along the way, an additional complement should be a constant urge for continuous improvement (Kaizen), which is an important concern in eliminating waste. A company may beneficially conduct various Kaizen-sessions where each session focuses on improving different areas where waste has been identified (Liu, 2012). In contrast to other manufacturing philosophies, Lean adapts flexibility and emphasizes cross-trained, multi-skilled employees rather than specialists to cope with changes and variations (Melton, 2005; Liker 2009).

3.4 Lean within Retail

Retailers have increasingly started using Lean initiatives, which is changing the way products are moved. The products are moving rapidly through the distribution centres to the store locations while using sales data collected at checkout which are being shared with suppliers, and predominantly using barcodes that accelerate the flow of products through manufacturing to store shelves (Myerson, 2014). Through investigations, it has been shown for retailers such as Dell, Tesco and Walmart that the Lean model may imply cost and efficiency enhancements as well as competitive advantages (Womack & Jones, 2005). Cases of Lean retailing show how companies aim to hold smaller inventories, shorten lead times and respond more rapidly to fluctuations in customer demand (Evans & Harrigan, 2005). Still most of these Lean initiatives have been focused on initiatives upstream close to the suppliers, rather than on what actually adds value to the customers. Yet, there are plenty of waste activities that can be seen every day in stores in terms of incorrect pricing, packaging, repackaging and back-storage structuring (Myerson, 2014).

The current thinking within Lean in retail has rephrased the concept to providing what the customers want, exactly where and when it is required. Hence, the Lean thinking is changing the traditional ways of conducting business to new more efficient approaches (Wright & Lund, 2006; Lukic, 2012). According to Lean retail studies, the effects of implementing Lean may, for instance, reduce labour costs by 10-20%, reduce inventory by 10-30% and decrease number of stock-outs by 20-75%. Moreover, by eliminating waste activities it is estimated that Lean thinking can improve business performance by 30-50% since waste activities tend to account for 60% of the activities performed (Lukic, 2012). Examples of technological tools to achieve such Lean improvements are; Radio Frequency Identification (RFID) and Electronic Data Interchange (EDI).

RFID serves as a tool for retailers to keep daily track of the sales of each product, improve inventory accuracy and thereby allow automatic replenishment. The RFID tag, or barcode sends information that is being collected by a receiver. Hence, the transmitter could function both as a tracking object in-store, but also as a security tag against theft. *EDI* allows for different parts to communicate quickly and smoothly across the supply chain by transmitting information at high speed (Evans & Harrigan, 2005; Lukic, 2012).

A study by Evans & Mason (2015) has been conducted on how the management of Tesco adopted Lean in their retail supply chain, which has contributed to their reputation of having a world-class supply chain. Firstly, Tesco identified the need to make sure efficiency was not improved on behalf of effectiveness. Meaning that delivering the value to customers may not be forsaken due to efficiency improvements. For Tesco to improve their supply chain with Lean, it was essential to centralise the distribution where suppliers delivers to consolidating Distribution Centres rather than to stores directly. That was needed in order to establish process control and make sure there was transparency in knowing which products existed. Moreover, Tesco chose to tackle the Lean approach through a four step process;

1. Establish process control
2. Time compression
3. Collaboration
4. Structure

Tesco established *process control* by standardising operational routines. As many of these operations are conducted millions of times through all the Tesco stores, the improvement opportunities are huge. Tesco therefore established routines in a certain best practice where local change to a routine is not permitted. Instead stores may propose suggestions to a central team, which evaluate the appropriateness of the suggestion. A typical routine is generally shown on a one-page document to personnel giving guidance in different circumstances. As a consequence the routine becomes a tool to adopt best practice and roll out potential improvements, and most importantly, provide stable processes that can be relied upon. *Time compression* was conducted through the transparency of centralised distribution allowing more accurate and continuous replenishing. Hence, it allowed for reduction of in-store inventories and in-store congestion severely by removing different deliveries from certain suppliers. Moreover, they compressed time by identifying and accordingly eliminated waste with the framework of seven wastes as suggested by Melton (2005) and Hines & Rich (1997). The replenishment accuracy is relying upon real time data, which might have its issues, e.g. as the data might indicate that the product is in store while it is in fact not available. Hence, there is a need for frequent updates and rapid replenishment. Additionally, Tesco appointed store personnel to fulfil online orders during idle time to reduce personnel costs. Continuously, Tesco initiated improvements of the *collaboration* across the supply chain through for instance EDI, Tesco Information Exchange and Vendor Managed Inventory (VMI), all of which were enablers in a retail industry with unstable demand. The Tesco Information Exchange is an online tool where Tesco and suppliers can access data relating to sales and stock, and answer upon current real-time data rather than fluctuations in demand across the supply chain and thereby avoid a bullwhip effect. Lastly, Tesco also appointed the *structure*. When appointing the structure they found that there was a huge amount of waste activities, namely double handling. As a solution, they combined the transit mechanism with the visualising in store to avoid further handling of personnel. For instance, the pallets on which bottles of soda were delivered, served as merchandising tools in store. These attributes resulted in major improvements as "the last 50 meters" initially represented 46% of the Tesco total Supply Chain costs.

Figure 4: A case study of Lean retail at Tesco, Source: Evans & Mason (2015)

3.5 Lean tools

As Lean is about eliminating waste and improving organisations efficiency, the starting point is to define what the customers' value. By doing so companies will also find and target waste, which enables opportunities to face underlying issues such as fundamental management concerns and quality problems. However, it is also important to understand that Lean needs to be aligned with the rest of the organisation. Each company adopting Lean needs to think through their own approach and not just copy others since the environments are often differing widely for different companies (Hines et al., 2008). Hence, as there is no universal method that applies to all organisations, it is important that companies find their own approach by using Lean guidelines (Bhasin, 2012). Lean is a philosophy involving many terms and aspects that can be applied differently, although there is a few that are more common than others (Melton, 2005). Some of the most famous and most relatable to Lean within retail are highlighted in the following sections.

3.5.1 Value Stream Mapping

The starting point of Lean outlines the ability to identify value and waste. To move forward it is essential to have an understanding what value means for the customer, although the examples may vary as the customers have different preferences. Waste is found in activities that do not add any value to the company and while it initially may be easily discovered, the waste reduction will be more incremental the further the processes improve (Melton, 2005). Research has shown that in order to fully understand this procedure, it is necessary to map the activities, namely by Value Stream Mapping (Hines & Rich, 1997). This is in line with what Melton (2005) describes, stating that Lean thinking should be started by documenting the current performance and process. When understanding the current state, it is possible to continue and identify the value and waste activities. While mapping the activities, Hines & Rich (1997) further describe that the activities can be categorized into three different groupings;

- Non-value adding (NVA)
- Necessary but non-value adding (NNVA)
- Value adding (VA)

The initial category is purely considered waste, including unnecessary activities that should be completely disregarded. This may involve, for instance, idle time and excessive handling of products. The second category, necessary but non-value adding operations, may be a source of waste, but necessary at the moment until the current operation evolves. Examples include unpacking of deliveries and transferring of tools. Value-adding activities are procedures that add value to the end product, for instance, assembly of components (Hines & Rich, 1997). The waste activities are more easily mapped by having a larger understanding of different causes of waste. Research suggests that there are seven commonly accepted main sources of waste within Lean. Myerson (2014) and Melton (2005) use the following terminology to describe these sources of waste:

1. Overproduction waste
2. Waiting waste
3. Transport or movement waste

4. Overprocessing waste
5. Unnecessary inventory
6. Unnecessary motion
7. Defects

Although these principles were originally stated for production in the automobile industry, Jones (1995) has described that the principles can be applicable across other areas in non-Japanese settings. For instance, overproduction may represent faster-than-necessary pace and defects might as well mean correction of mistakes in a business not involving production. Hence, it is justified to do some translation of terminology in order to adapt to a particular part of the stream, or a specific industry. Nonetheless, it can be seen as a useful framework involving an extension of the effective internal waste reduction philosophy first applied at Toyota (Melton, 2005).

3.5.2 5S

The 5S method is applied to obtain and maintain order and cleanliness at work, by having a well-organised workplace complete with visual controls (Myerson, 2014). It is a simple tool that increases productivity; improves quality, safety and security; and introduces the basic principles of visual management and control through standardisation (Chiarini, 2012). The benefits obtained through the 5S method can be measured by the indicators of productivity, amount of space gained, defects found, lead time, and accidents and injuries occurring (Chiarini, 2012). 5S is split into five phases; each named after a different Japanese term beginning with the letter *S,* hence the name 5S. More commonly, the phases are used in their translation to English: *sort in order, set in place, shine, standardise,* and *sustain* (Chiarini, 2012).
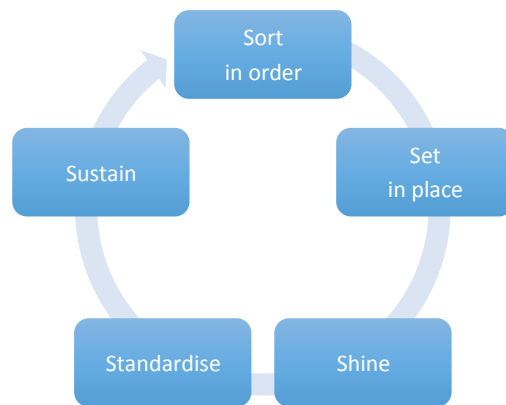
Figure 5: 5S in Lean, Source: Own developed model

Sort in order emphasizes the importance of choosing the useful activities within a process and separating them from the useless ones, consequently sorting and removing everything that is not useful to the process (Chiarini, 2012). Additionally, this phase includes sorting out items not necessary such as excess inventory, equipment, tools, furniture, and other things that do not belong (Myerson, 2014). *Set in place* refers to tidying up the workplace and putting tools, equipment and everything else that actually is used during the process in an accessible place (Chiarini, 2012). At this point, visual controls are beneficially used like colour coding and

outlining to make it clear where things go (Myerson, 2014). *Shine* means literally to shine, or clean up, the work area, namely keeping the area clean (Chiarini, 2012). *Standardise* signifies the need for standardisation by having instructions and applications easy and simple to understand, as well as creating a consistent way to carry out tasks and procedures (Myerson, 2014). Lastly, *Sustain* means to sustain and improve the order and tidiness achieved throughout the process (Chiarini, 2012). For each and every one of these steps a certain discipline is required, as the goal is that they should become part of a long-lasting routine (Chiarini, 2012). A workplace that is clean, organised, safe, and efficient results in fewer accidents, improved efficiency, reduced searching time, visual workplace control, as well as a foundation for all other improvement activities (Myerson, 2014).

3.5.3 Lean Six Sigma

Lean Six Sigma is originated from a statistical measure to reach a minimum number of defects and thus improve the processes. It has from there evolved to a philosophy and become more multifaceted as it has been transformed from the original manufacturing industry into other areas. A defect may therefore represent not only a broken item, but also something that does not meet the customers' expectations (Pepper & Spedding, 2010). According to Pepper & Spedding (2010), combining Lean with Six Sigma has large potential as it implies a quality management approach that can be regarded to bring many positive aspects to continuous improvement. Lean Six Sigma relates similarly to Heijunka, which intends to decrease the variability, and to Jidoka, which strives for improved quality. The goal by combining Lean and Six Sigma is to improve the speed and efficiency as well as decrease the number of incomplete items that reach the customer. This is conducted by identifying and removing causes of errors and defects and thereby minimizing the variability. Preferably, this can be done by Value Stream Mapping to identify the challenges, continuing with benchmarking and prioritization of which improvements that may generate the greatest outcomes. A formal model for reaching process improvements within Lean Six Sigma is known as DMAIC (Pepper & Spedding, 2010; Myerson, 2014):

Define	Identify the customer requirements and clarify the issue
Measure	Choose what needs to be measured and collect information
Analyse	State hypotheses and examine the root causes
Improve	Come up with solutions, either by developing new processes or improve current ones
Control	When changes are done, there is a need of monitoring to make sure progress is continued

Figure 6: Lean Six Sigma - DMAIC, Source: Myerson (2014)

An example stated by Myerson (2014) explains how a U.S. retailer was incorrectly delivering 20 000 boxes each year resulting in extra costs and reduced customer satisfaction. The project team managed to reach savings of $30 000 and a 65% decrease in errors through several relatively simple and low-risk solutions such as route changes, installing large whiteboards with planning data, and moving the label printing to a more visible location.

3.5.4 Kanban

Originally Kanban, meaning instruction card in Japanese, was used as a signalling tool to regulate the flows in a JIT-concept by handing a card across the different operations. It requires the philosophy of a "pull" approach since a Kanban card, which serves as a signalling device, gives authority for downstream operations to produce or supply products due to a need further upstream (Jacobs & Chase, 2014). Although Kanban, same as other Lean principles, was initially meant for the production industry within Toyota, it is applicable into other areas. It may serve as a tool to communicate externally with suppliers, but also internally as a communication tool among internal processes. Depending on the product and characteristics, there can be Kanban cards provided for each product or a Kanban that serves as a request for a Kanban box or trolley. Thus, the main purpose is to signal a certain need or information across the value chain for other operators to respond to (Chiarini, 2012). However, a Kanban approach is not necessarily visualised by the use of instruction cards. It may also be represented in digital signals or practically, through Kanban squares. A Kanban square, can for instance, be a marked space on the floor where authorization is given to produce or supply depending on the current fulfilment of the square (Jacobs & Chase, 2014).

3.6 Staying Lean

After having implemented Lean approaches within the organisation, it is essential to make sure the organisation do not relax and lose its Lean focus. It requires substantial efforts in order to stay Lean and facilitate certain improvements. It is thereby critical to make sure that the new processes are being followed and that the layout is outlined according to the initial design (Hines et al., 2008; Melton, 2005). Bhasin (2012) states that each recorded Lean failure has been a consequence of issues with corporate cultural and change management. Some of the most common reasons are people-related, involving limited communications and opposition by employees. Hence, it is essential to anchor the traits of Lean in the organisation and culture. Beneficially, a sense of urgency should be established in the implementation as it is in line with the competitiveness of Lean, namely speed to market (Bhasin, 2012). Moreover, Hines et al. (2008) states that organisations that fail to implement a Lean approach usually only concentrate on Muda (waste). It is also essential to avoid Mura (variability) and Muri (overburden), since they are all linked together. The following illustration exemplifies what the interpretation might look like in a university environment.

MURA
All courses start in September

MURI
High stress period for admissions staff

MUDA
Too many admissions staff in the rest of the year
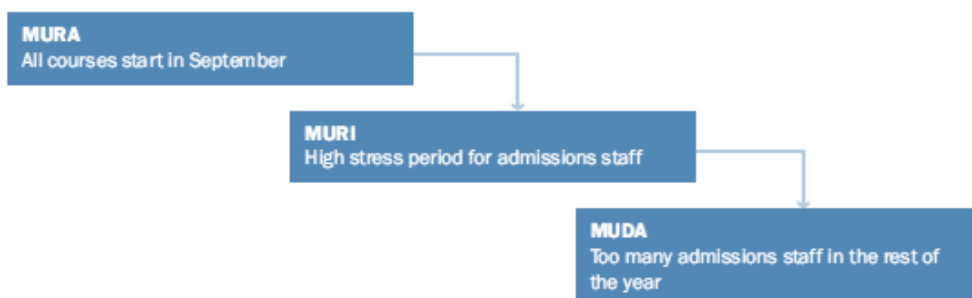
Figure 7: Illustration of the linking of Mura, Muri and Muda, Source: Hines et al. (2008)

Preferably Lean should be implemented to all parts of the supply chain if the benefits are to be maximised (Melton, 2005). Accordingly, it needs to be embraced across the organisation and improving processes as a whole, not specific departments. Furthermore, it should be communicated to everyone what is being done and why it is being done in order to get everyone on board. This includes the whole organisation, which may be illustrated by the Lean Iceberg model (Hines et al., 2008):
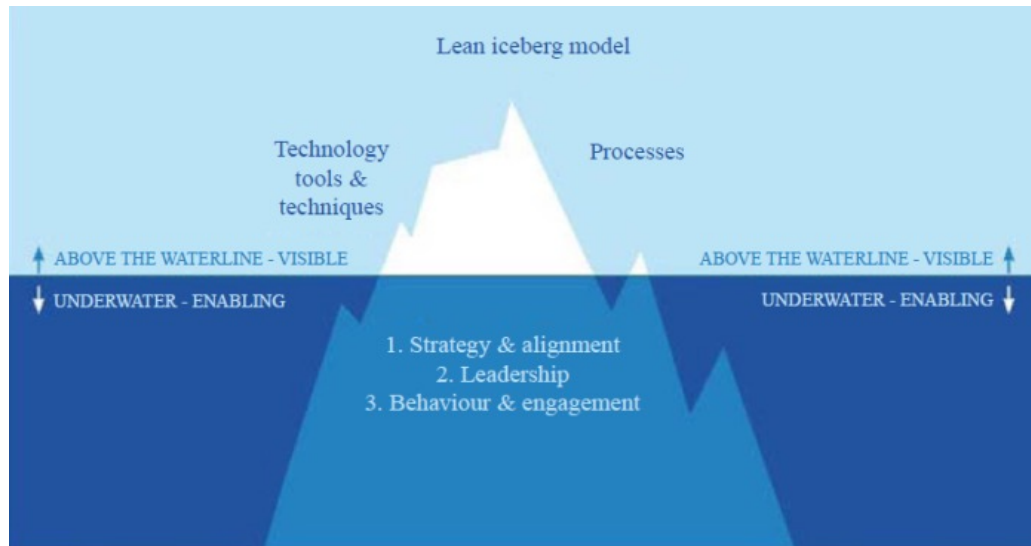
Figure 8: Illustration of the Lean iceberg model, Source: Hines et al. (2008)

It is vital that the Lean thinker acknowledges aspects that may not lie on the tangible surface. Firstly, the strategy should be aligned and not collide with Lean, or there will be contradictions internally. Additionally, it is the leaders that lead the change, even though they might not be directly involved in the operations. Hence, the leaders are required to be the guardians and have a long-term perspective, since the very essence of Lean is a lasting and continuous process (Hines et al., 2008; Bhasin & Burcher, 2006). Lastly, it is sufficient to have proper engagement to succeed in the implementation. Although, some engagement is individual, it can also be tracked to how well things are communicated and how well the employees are trained (Hines et al., 2008).

4. Empirical findings

In the following chapter the results of interviews with twelve Intersport stores across Sweden are presented. The chapter describes the general flow within an Intersport store and touches upon ways of working, showing cases where differences and similarities exist between the investigated stores. Lastly, general findings that affect the store activities from outside of the store environment are discussed.

4.1 Empirical introduction

In our methodology it was revealed how the choice of stores to interview was spread in terms of store characteristics as well as a geographical spread across Sweden, with the purpose of obtaining as wide picture as possible. Accordingly, the results collected have shown substantial differences in terms of way of working and store layout. These empirical findings further underline the fact that there are few processes that are currently standardised across the network of stores. Consequently, while listing potential issues or areas of improvement there were many factors mentioned, and they in turn differed widely. In addition, there were also many positive experiences; for instance, most stores expressed a positive working environment with excellent internal communication. Another substantial difference between stores is the appointment of different work tasks internally. The larger stores normally have dedicated back-storage personnel who perform most tasks in the back-storage area, while in other stores where the supply of products is lower, the personnel perform the same tasks both in the back-storage area as well as out in the store.

Receiving Delivery
- Arrival – checking number of boxes
- Identifying boxes and examining content towards delivery note
- Unpacking and sorting of content
- Registration of content into the inventory IT system

Handling of goods back-storage
- Attaching or correcting price tags
- Attaching security tags exclusively or partially at back-storage (75% of stores)
- Attaching clothes hangers exclusively or partially at back-storage (83% of stores)
- Dispatching into baskets or onto moveable carriers

Transition back-storage to store
- Store personnel pick up products in dedicated area (33% of stores)
- Store personnel pick up products only after confirming with back-storage personnel (67% of stores)
- Attaching security tags exclusively or partially in-store (50% of stores)
- Attaching clothes hangers exclusively or partially in-store (42% of stores)
- Potential adjustments; e.g eventual removing of clothes hangers or correction of price information
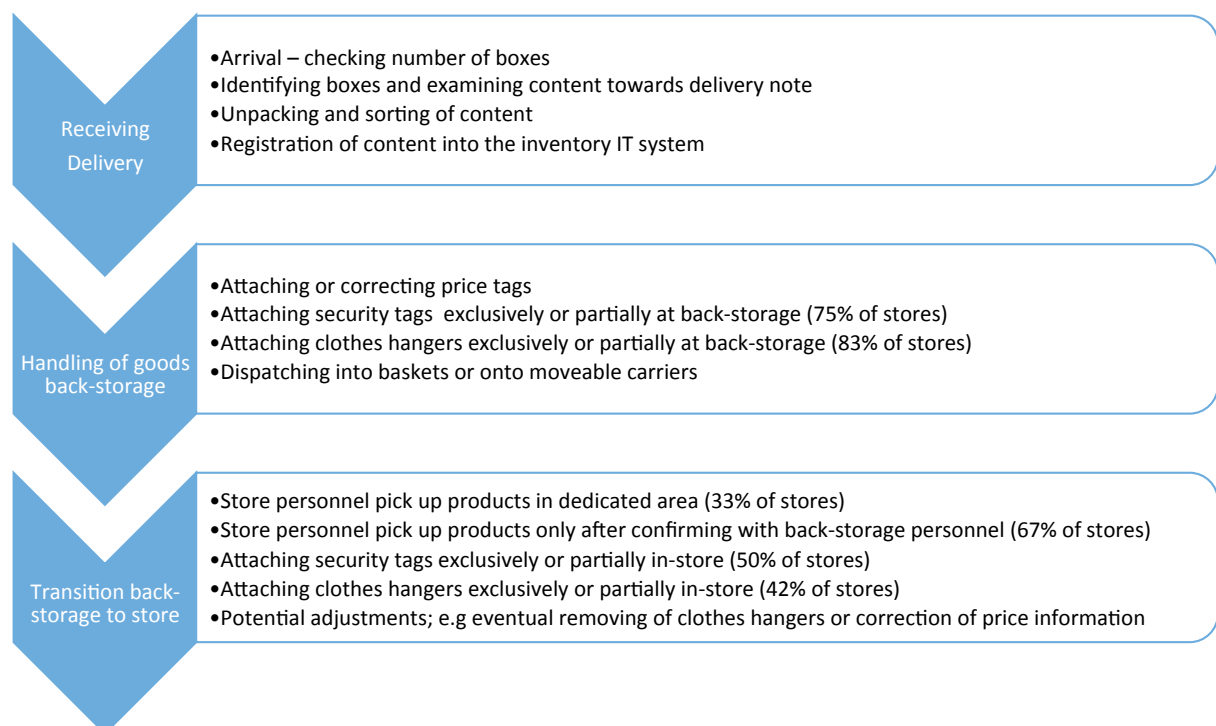
Figure 9: Visualising flow from product delivery until located upon shelf, Source: Own developed model

Exhibited above (*Figure 9*) is a visualisation of the process from delivery of a product to the back-storage to the transition into the store spaces. As the procedures are dependent on the characteristics of the store and the experience of the workforce, this illustration mainly serves as a general outline of the flow. The mapping of the process is a summary of the interviews with stores where interesting differences and internal initiatives were documented. These further findings will be elaborated in the following sections.

Furthermore, one pre-requisite, as a way to ensure gathering of the most reliable data through interviews and observations, was to let the stores be anonymous when presented and analysed. Thus, the twelve interviewed stores will be presented by letter coding from A to L in the following sections.

4.2 Receiving delivery

4.2.1 Arrival check

The shape of delivery differs slightly between the stores; some receive their deliveries on pallets, while others receive them stacked on moveable carriers, depending on what is agreed upon and in consideration of store space. When the transporter arrives with the goods, it is essential to start by counting and making sure that the numbers of cartons delivered match the delivery note correctly. This needs to be assured before signing the papers of the hand-over, since any claim of potential missing boxes cannot be made when the papers have been signed. The counting of arriving boxes often takes substantial time. Therefore it would be beneficial to be able to scan a larger number of cartons as one, as exemplified by some of the interviewed stores where the boxes came located on pallets. However, the stores overall agree that a mismatch of boxes is usually not a problem, since in the case when the number is inaccurate, the missing carton is usually showing up the morning after. Thus, it is quite rare that boxes disappear entirely in the transporter's care.

Although the number of boxes is usually not a problem, the actual content of the boxes are. Even though some improvements have been identified there are still often a mismatch of the content of the boxes. For instance, there are often mismatches in terms of a certain size missing or certain colours of a product. One of the smaller stores report that this happens at least once each week while another one suggest that they reported differences more than a hundred times last year. It is clear however, that currently the accuracy of the content cannot be relied upon. This has led to differences in the decision of the stores whether to check that each sent product match the delivery note, and thereby invest a lot of time to make sure the inventory information is accurate, or whether it is better to not spend any time checking and rather stand the inaccuracy and correct it later at a potential stock investigation. The interviews conducted reveal that 58% of the stores check the content of each box, while 33% perform some sample testing, while another 8% do not do any checking at all. One of the larger stores expresses their point of view on the matter:

"We do not have the time to check the content of each carton while considering the huge amount of deliveries we have. We believe it is not justified to put in the amount of time for the difference it make" - Store B

However it is clear that the opinions on this matter differ wildly, although it is not entirely true to rely on the size of the store when determining the opinion of the store. For instance, one of the other larger stores claims that:

"We check the content of each carton, and it's definitely beneficial economically. I believe the economical benefits of making sure the content is accurate cover our entire salaries. All stores should do this" – Store K

The consequences of checking or not comes down to inaccurate inventory levels since the products that should be delivered may not have been so. Hence, when store personnel search in the inventory IT system it might indicate that the product should be present although it is not. Store K states that those mismatches would be huge at the point of a stock investigation if they would not check each product at delivery. One consequence of the mismatch may be the loss of sales; another one might be inaccurate replenishment. The replenishment from the distribution centre is automatic depending on what specific products are being sold, and if the wrong data gets registered, the wrong amount of products will automatically be replenished.

4.2.2 Unpacking and registration
The unpacking and sorting of content can be a time consuming aspect due to many boxes arriving at the same time. One factor that complicates this procedure is the allocation of products into separate boxes. As it happens now, a product model might be separated at the distribution centre into different boxes resulting in time consuming sorting and searching of different boxes to finish a product line. For instance, this might be expressed by size Medium of a product ending up in one box while size Small and Large of the same model end up in another. However, the majority of the stores incline that the allocation has continuously been improved over time. If the space at the back-storage allows for it, the personnel have the habit of opening up the boxes and thereafter sorting the product into different areas. Generally when prioritizing, the stores focus upon unpacking the replenishment products first since they can go straight out to the store area and do not need a new spot assigned in the store. Moreover, the replenishment often consists of standard items that sell well and thereby needs to be supplied as fast as possible. Even though, it is mostly focused upon the replenishing products, some prioritization is made with regards to product characteristics.

"We prioritize bulky items, we have to get rid of those fast due to a lack of space at the back-storage" - Store A

Moreover, when the products are being unpacked, an additional step is the registration of the content into the inventory IT-system. Gathered from the interviews, the personnel across different stores work differently when it comes to registering delivered products into the IT system. One third of the investigated stores state that they tend to register the products into the

IT system in the mornings in connection to the delivery, or in accordance with the sending list that is being sent from the distribution centre over the night. If there is a mismatch, it can be corrected afterwards. Another third of the stores are normally conducting the registration around midday as they by then have had an overlook of what have arrived and which products need price tags that accordingly can be printed easily at the time of the registration. The last third of the stores conduct the registration when the unpacking and such is done, usually during the afternoon or in the end of the day. One of the stores do it as a routine when reporting delivery faults in the end of the day, and another do it as a step to make sure all other activities are conducted before registration.

"It has to wait, otherwise they are calling me all the time from the store when they have searched in the inventory IT system and found that the product is located back-storage. We cannot spend time digging around boxes that hasn't been unpacked" - Store D

Notable is, that until the registration is conducted, a sort of grey zone occurs. Even if the product is located physically in the back-storage, it is not registered digitally. As a result it is not visible in the inventory search of the IT system, which the store personnel conduct frequently as a response to customers asking for a product or a certain size of a product. Each store employee conducts these inventory searches several times per day. Moreover, the back-storage personnel insist that they do not allow store personnel to dig through boxes where the content is not registered as it then becomes hard to know what has actually arrived when products are taken out before registration. Hence, unregistered products are seldom being sold. Some stores however, claim that store personnel may take something as long as they leave a note stating what has been taken.

4.3 Handling of goods back-storage

4.3.1 Attachments
In general, the stores start the attachment of price tags, security tags and clothes hangers after the delivery have been registered into the IT system. After the registration and checking of content, we have found that there are a number of different ways in which the stores handle the goods. In some cases these activities are done only in the store, and in some cases personnel from both areas collaborate with attaching supporting equipment as a way to save time. However, in most cases the back-storage personnel exclusively perform these activities.

Activity performed	Attaching security tags	Hanging of clothes	Attaching price tags
Back-storage	50%	58%	100%
In-store	25%	17%	0%
Both locations	25%	25%	0%

Figure 10: Location of attachment activities, Source: Own developed model

Through our empirical findings we have noticed that there is a coherency that transpires throughout all stores, and that is the attachment of price tags. This activity is being done

exclusively by the back-storage personnel, and often in connection with unpacking the goods. It is still a reoccurring problem that products that should have price tags attached at delivery in fact are being delivered without. The interviewed stores state that it is a daily occurrence, but only for a small fraction of the products that are being delivered. This regards replenishment orders from Intersport's distribution centre, as it is these products that can be expected to come with price tags already attached.

"The issue with products being delivered without price tags has improved over time, but there are still products that come without. As of now it occurs daily" - Store D

Furthermore, the empirical findings point towards a recurring difference between the price stated on the delivery note and what can be found in the IT system. As a result, the back-storage personnel have to correct any differences by printing out new price tags for the affected products, which adds an extra activity and more non-value adding time. In turn, if the back-storage personnel fail to notice this error it will land upon the store personnel to correct it, either by noticing it themselves or when a customer wishes to checkout a purchase. 8% of the investigated stores find the process of attaching price tags to be the most time consuming. In addition, because of a poorly structured back-storage area and no real planning when it comes to locating supporting equipment close to related tasks, many stores report wasteful movement in the process. In many cases of the empirical finding, this is not something the respondents point out but has instead been a result of conducted observations. In one store it transpired in the case of a printer printing price tags being located out in a store inventory instead of back-storage, where the other related tasks were performed. Consequently, we then asked the question why they had it structured that way, and received the answer that that is just how it had always been.

When it comes to the activities of attaching security tags and attaching hangers, these are generally done on a workbench located in the back-storage space. Overall, we found that there is no standardised approach as to how the workbenches should be designed or where they should be located in the back-storage. Each store has their own construction, designed after their own special conditions. However, each store had in connection to the bench, often beneath or on the side of, baskets located containing tags and hangers to be used in the work. At Store H they have put smaller containers with security tags on the workbench more easily accessible to the back-storage personnel. In some stores, like at Store J, there are visual guidelines put up above the workbench stating how to attach security tags and hangers and to what product. In addition, most stores have guidelines on how much a product must cost for it to need a security tag. For example, stores that are centrally located in malls or in a downtown area have an increasing theft problem and thus attach security tags to almost everything.

When it comes to attaching hangers, the employed decorator or other person in charge of the exposure in-store decides the guidelines in each store. In 58% of the cases, attaching hangers are exclusively done back-storage. However, the store areas are ever changing and the person in charge of decorating might want to have a product that used to be exposed on hangers

instead folded on a bench. This leads to unnecessary work when a product is attached to hangers at back-storage and then needs to be taken down and folded by the store personnel.

"Sometimes there can be some confusion as to what should be attached to hangers and what shouldn't. It happens that we hang something back-storage that the store later takes down to fold instead" - Store F

In 42% of the cases back-storage personnel have the store personnel help them with attaching hangers mostly because they do not have time to do it alone. This correlates with the notion that 50% of the investigated stores find the process of attaching security tags and clothes hangers to be the most time consuming. Furthermore, without us asking specifically about it, 50% of the interviewed stores argued for having the clothes already attached to hangers at delivery.

"Some products from external suppliers arrive attached to hangers. Why can't we have all products do the same?" - Store D

At Store J, Intersport's new concept has been implemented, which is leaning more towards having next to everything exposed attached to hangers. Needless to say, the personnel here were especially keen on having the products delivered already attached to hangers.

4.3.2 Dispatching goods after unpacking

We have found that there are a number of different ways of handling the goods after being unpacked. In those stores where all the activities of attaching supporting equipment are being done back-storage, the finished products are put aside in the back-storage often hung or folded on moveable carriers equipped with hangers and bins. In the stores where both back-storage and store personnel perform the attaching activities, the back-storage personnel make sure to have the unpacked products on movable carriers for the store-personnel to collect for attaching of security devices and hangers in-store. In these cases, the back-storage personnel often put the products they do not have time for on these carriers and continue with finishing the prioritized goods first. Lastly, in the stores where neither attaching of security tags or hangers are being done back-storage, the personnel unpacks the products, attaches correct price tags, and then puts them directly on moveable carriers ready for the store personnel to roll out to the store area. The store-personnel themselves then attach security tags and either attaches hangers or fold the products making them ready for purchase.

As shown in the previous section, the majority of the stores perform the activity of attaching security tags, price tags and hanging of clothes in the back-storage spaces. A result of having performed these activities back-storage is that the products are equipped and ready to be sold before being rolled out to the store. Hence, in this scenario the only activity the store personnel need to do is make the products visibly available for purchase. 33% of the stores have dedicated areas where the back-storage personnel put products ready to be dispatched out to the store spaces. The criteria for being referred to as *products in a dedicated area* is that the products need to be hung or folded on a fixed shelf or a moveable carrier equipped with

hangers and bins, located in a dedicated area commonly known for all the personnel, and more importantly have price tags and generally security tags attached. 4 out of 12 stores have these dedicated areas that are commonly known by all the personnel to be the area where finished, or next to finished, products reside. In three of these cases this area is located back-storage visualised by a sign reading *ready replenishment products* or *new orders*. In the fourth case the dedicated area is located out in the store. From the empirical findings, we gathered that it is a common opinion of back-storage personnel to wish they could put their finished goods in a dedicated area out in the stores, because it would open up a lot of storage space.

"We often need to restructure the back-storage area to make room for more goods. The moveable carriers with finished goods are in the way, wherever they are put. It would be in our favour if the carriers with finished goods could be allocated to the store space" - Store H

4.4 Transition back-storage to store

4.4.1 Making products available for customers

In the process of transferring the products from the back-storage area to the shelves in the store there are some differences in how the stores operate. The majority of stores (67%) work by transferring through active communicating between the personnel in the store and the personnel at the back-storage location. Normally by the store personnel entering the back-storage asking for goods to bring out to the store, or either by the back-storage personnel going out assigning store personnel with ready products to be taken care of. While some find the collaboration working well, others identify areas of improvement.

"In the best of cases, store personnel comes in here to the back-storage to pick up and bring products out to the store. Though, in worst of cases, it happens that the products stay in the back-storage quite long since the store personnel might not see them hanging here when they pass by" - Store H

On the other hand, as mentioned, 33% of the stores have dedicated areas where the back-storage personnel leave products with the criteria of being ready-made for the store personnel to take over. In three of the stores it is displayed as an area or a shelf at the back-storage marked for instance *ready replenishment products* where the store personnel can regularly go checking if there are products to bring out to the store even without asking the back-storage personnel. It is expressed that they intend to make this a routine that store personnel frequently come by looking for products to bring out to the store and thereby make them available for purchase. One store has a dedicated area within the store itself where the back-storage personnel drop of the products that are ready for purchase. As so, the products are hanging on moveable carriers or placed in containers waiting for store personnel to take care of. Meanwhile, it is also accessible for the customers to pick and in turn purchase as the area is located in the store itself.

"The store personnel try to take care of the products in the dedicated area as fast as possible. However, the products are also accessible for the customers while hanging there, and we have found that those products often signals interest to the customers as they are distinguished from the others" - Store I

Thus, they find this to be an appropriate way as the products are accessible for the customers, even though not yet located upon its proper shelf, and it signals interest as the customers see that those products are new to the store. The personnel at Store I find the dedicated areas beneficial as it do not require extra communication between the employees, and thereby back-storage personnel do not have to be present when store personnel find products to bring out.

4.4.2 In-store activities

As it has been explained earlier, most stores conduct the activities of attaching security tags and attaching clothes hangers at the back-storage. However, there are also stores that conduct the activities both at the back-storage and in the store itself, depending on workload of the different roles, or how fast the products are to be made available with regards to, for instance, marketing campaigns. Hence, store personnel conduct these tasks during idle time when they are not occupied by sales or other customer experience activities.

"Generally, there are not a lot of customers in the morning shift, which means we can help with attaching clothes hangers and security tags at the checkout counter when we have time"
- Store E

Moreover, there are a few stores that conduct about all attachments of security tags and clothes hangers within the store itself. The reasons vary, though one store claim that the person at the back-storage has no chance to do it all due to time restrictions. Accordingly, store personnel are assigned to attach security tags and clothes hangers as it also serves as a compliment of tasks within the store. For instance, they can do this in-store and conduct the work while at the same time overseeing the dressing room and assisting customers. As a consequence of doing the attachments within the store, they have full control of the task and make sure to attach hangers only on the clothes that are in need of one to be exposed accordingly. Otherwise, stores report that some products may be attached to clothes hangers at the back-storage but subsequently store personnel might remove those same clothes hangers again, since it might have been decided that the product should be visualised as folded on a table rather than hanging.

4.5 General findings

While having described the flow of the product in our investigated stores according to the visualisation in *Figure 9*, there are still surrounding factors necessary to mention. Even though, these aspects are not performed within the store itself, they certainly affect the work that is taking place in the store. Hence, some aspects needs to be elaborated that may improve the current flow. Firstly, the way the packaging is being done at the distribution centre results in a large time consuming factor for the stores. During the interviews, most stores explained

an urge for better packaging in terms of allocating the pieces of a certain product together rather than in separate boxes. Even though, improvements have been seen over time there are still potential for further improvement on the matter. Another factor regarding the packaging, are deviations between actual content and what is stated on the delivery note, which was touched upon earlier. This is explicitly a result of deficient handling at the distribution centre, which is a rather frequent occurrence according to the stores. This fact does not only result in some stores making sure to thoroughly check each product that arrives manually, it also results in additional tasks such as registration of deviations in the IT system as well as editing the invoicing programme Medius to obtain a credit for the lost goods. One store even named administrating through Medius as the most time consuming part of all tasks conducted. Furthermore, should the differences not be registered, which is the case in many stores, it leads to inaccurate inventory and central replenishment from the distribution centre that does not match the actual reality.

Another often mentioned aspect is communication. The internal communication within the store is often pointed out as a success factor by the stores, as well as a factor that is being well conducted currently. However, the communication with Intersport headquarters split the stores in different opinions. Some of the stores have closer collaboration with the headquarters and are, for instance, included in a committee discussing different matters of distribution and logistics. Thereby, they are pleased with the current set up and find it to be satisfying. There are however several other stores stating that it is hard to find the appropriate contacts at the headquarters concerning a specific subject such as IT or invoicing. The issues often tend to get delayed as well, either by the person not responding or delays by the struggle of finding the right person to answer the questions. However, in a store environment it is critical that they get answers quickly as there are frequent deliveries that cannot wait. One store further mentioned that they believe the headquarters does not fully grasp the reality of the stores issues due to the fact that few employees at the headquarters have worked in a store themselves.

To conclude the empirical findings we have constructed an illustration to further visualise the process from delivery of a product to the loading dock, through the back-storage area and on to the transition into the store spaces, in chronological order. This illustration (*Figure 11)* is a generalisation of the process, created from comparing the empirical findings from each store, and thus serves as a general outline of the flow. We will further discuss this figure in the analysis section of the thesis.
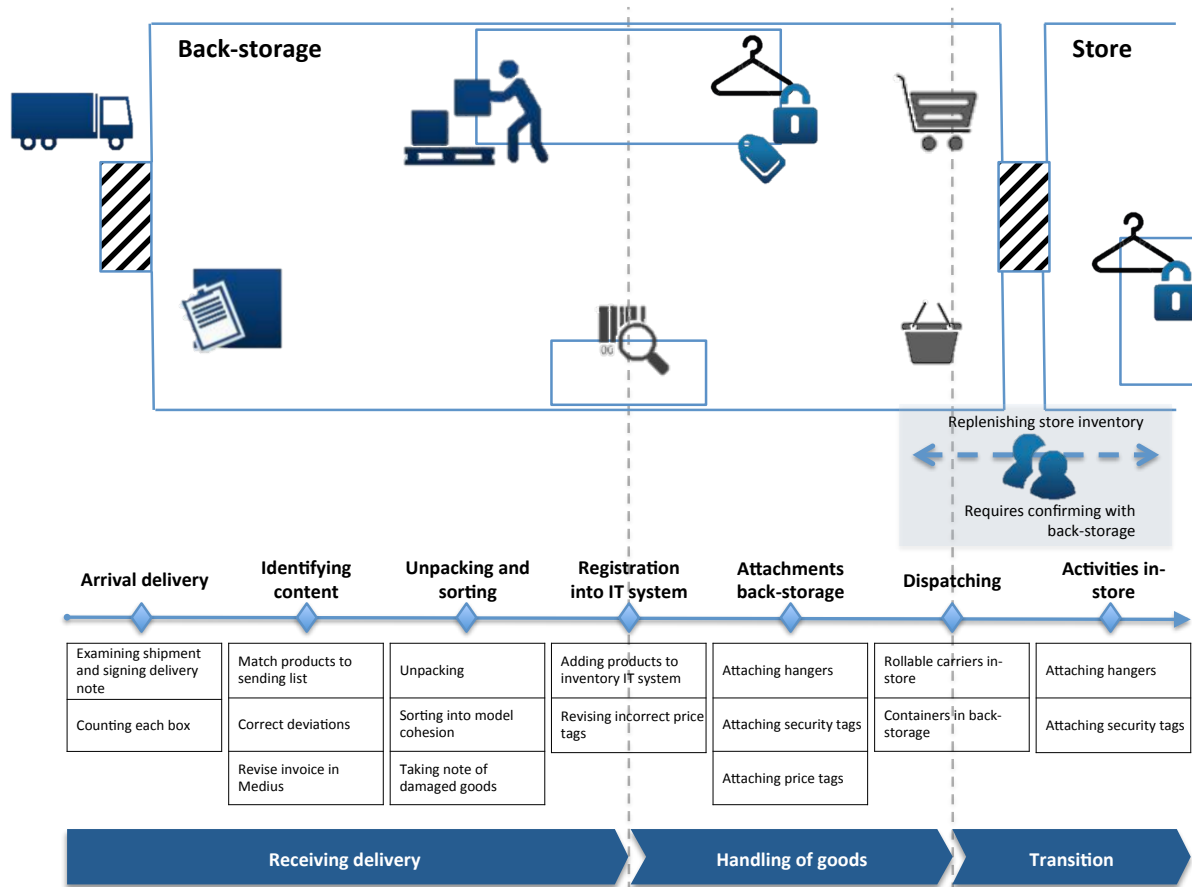
Figure 11: A generalised illustration of the actual process, Source: Own developed model

5. Analysis

In this chapter we will return to our theoretical framework and use this to discuss and analyse our empirical findings. The analysis will be following the structure presented in chapter four, empirical findings, where the process has been broken down into three sections chronologically depicting the internal supply chain. Lastly, essential general findings are discussed and linked to relevant theory.
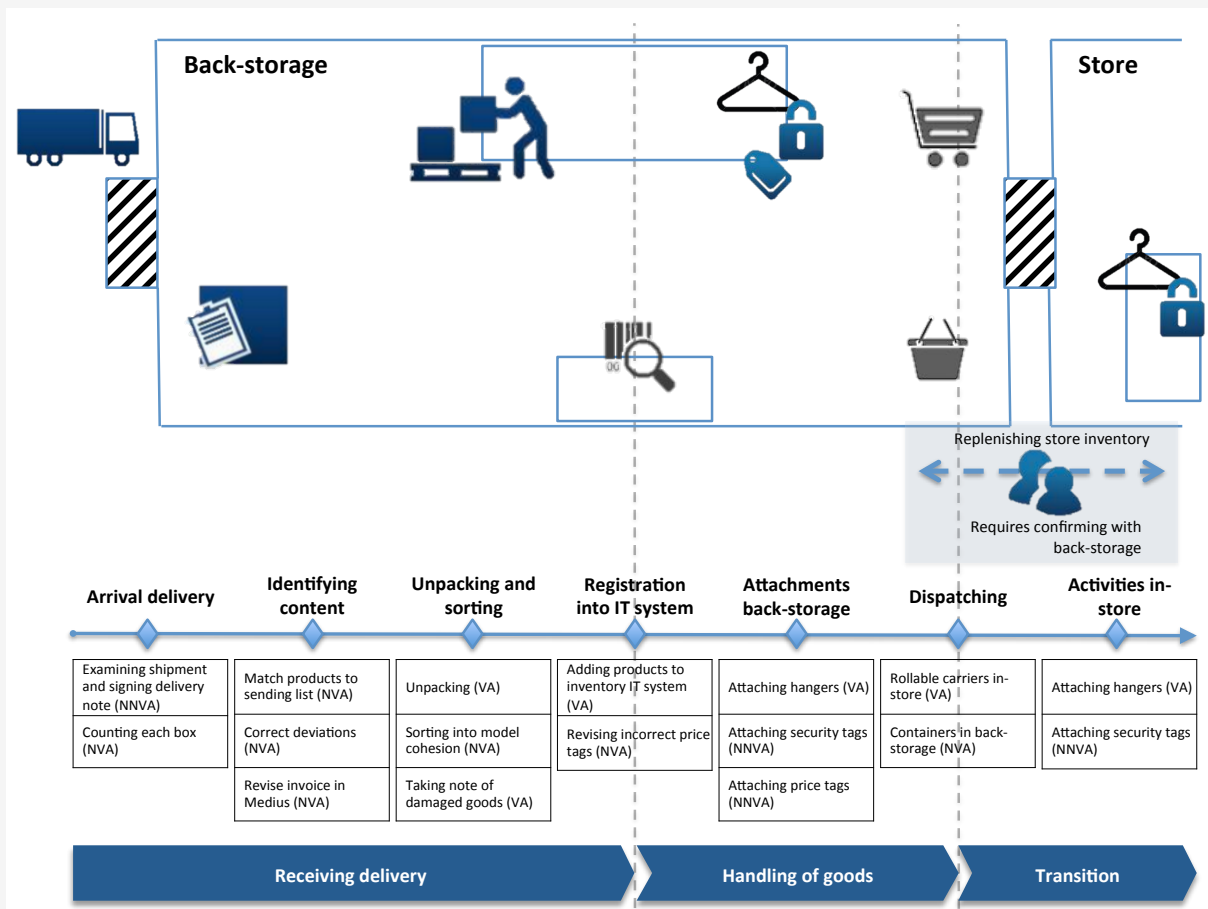
5.1 Introduction to analysis

When considering retail in general, Puccinelli et al. (2009) points out the importance of the retail environment and of understanding the customer. Our study has shown that the Intersport stores are well aligned with these statements as they continuously return to focusing on the customer during the interviews and emphasize the customers' perspective. As Bäckström & Johansson (2006) imply, retailers tend to focus on new technological solutions and design elements, while customers themselves value layout, price, selection, and expertise the most. From our findings, it remains clear that Intersport maintain their standard in all of these aspects, as we see no signs of any malpractice. However, Intersport does additionally add technological concepts in their new stores to increase the availability to the customer with in-store portals where the customer can use a search function to see availability of certain products. We find that this is a justified element in order to keep up with current competition. Maintaining focus on traditional values, such as price and expertise, does not necessarily mean that technology should be neglected. Rather, these findings should further emphasize the importance of traditional values and make sure they are not forgotten in striving to improve and find new opportunities. The need of efficient store operations, as stated by Barnes & Lea-Greenwood (2010) and Hayes & Jones (2006), is somewhat differently considered across the stores. Nonetheless, the opportunity of this thesis is a result of the awareness of the headquarters. This is further in line with the statement by Lambert & Cooper (2000) that supply chains work as a larger whole. For instance, the headquarters at Intersport are working with shortening lead times and improving efficiency from suppliers, and with store operations by engaging this thesis, as a way of coping with fast fashion.

Seeing as this report aim to investigate supply chain efficiency in retail with a Lean approach, it is beneficial to start with Value Stream Mapping, a method suggested as the first step of Lean. According to Hines & Rich (1997) and Melton (2005), research has shown that it is an essential tool in order to fully understand the procedures taking place in a process. By mapping the activities it is possible to identify waste activities and what actually brings value. According to the method of Value Stream Mapping, the activities can be categorized into three different groupings, namely *Non-value adding (NVA)*, *Necessary but non-value adding (NNVA), and Value adding (VA)*. These categories are all considered out of the customers perspective, in other words we have exclusively considered if an activity or task are bringing value to the customer or not.

Since mapping the activities and outlining the ability to identify value and waste is a starting point of using Lean in an organisation, we set out to map the process of a product from delivery to transitioning into the store area, as well as strive to analyse value and waste activities in the current state. The result is visualised below, with each activity marked *VA*, *NVA*, or *NNVA*. The visualisation is only a generalised example of the activities being done taken from our empirical findings of 12 stores. Hence, it cannot be said that each store follows the same procedures as shown here.

Arrival delivery	Identifying content	Unpacking and sorting	Registration into IT system	Attachments back-storage	Dispatching	Activities in-store
Examining shipment and signing delivery note (NNVA)	Match products to sending list (NVA)	Unpacking (VA)	Adding products to inventory IT system (VA)	Attaching hangers (VA)	Rollable carriers in-store (VA)	Attaching hangers (VA)
Counting each box (NVA)	Correct deviations (NVA)	Sorting into model cohesion (NVA)	Revising incorrect price tags (NVA)	Attaching security tags (NNVA)	Containers in back-storage (NVA)	Attaching security tags (NNVA)
	Revise invoice in Medius (NVA)	Taking note of damaged goods (VA)		Attaching price tags (NNVA)		

Receiving delivery	Handling of goods	Transition

These findings and categorisations give an indication of the importance of the different tasks. An organisation should aim to keep and maintain value adding activities, while it should aim to dismiss non-value adding activities. Some non-value adding activities are however necessary, but likely modifications and improvements will serve. These issues will be further discussed and outlined in the following sections.

Figure 12: A generalised illustration of the actual process categorised after value adding potential, Source: Own developed model

5.2 Receiving delivery

5.2.1 Arrival check

As the products arrive to the store, the first task for the back-storage personnel is to conduct an arrival check of the shipment. Examining the content and signing the delivery note does not provide any value for Intersport's customers although it is currently a necessary step, as it is required to obtain the goods. Thus, we categorise it as necessary but non-value adding. However, spending significant time counting each box is another matter. We argue it is distinguished as unnecessary movement or motion waste, in regard to Myerson (2014) & Meltons (2005) definition of different sorts of waste. Especially since several of the stores have expressed a dissatisfaction with the current setup as counting the number of boxes can be truly time consuming, particularly in a stressful environment in the larger stores where the shipments are occasionally huge.

The most straightforward solution to eliminating the step of counting each box would be to build a reliable relation with the delivery company where it is possible to rely on the fact that the delivery reaches the accurate number of boxes. However, as that is currently out of control from the stores perspectives, there are instead some alternatives to improve the procedure and reduce waste. Literature about Lean in retail by authors such as Mckinnon et al. (2007), Evans & Harrigan (2005) and Lukic (2012) consistently state the advantages of RFID and barcodes. This is further proposed by one of the stores as a tool for simplifying and making the process more efficient. If each box contained a bar code, it would be quickly scanned and the adequate number of boxes registered correctly. Another option would be to use passive RFID tags where a transmitter is located in each box and receivers placed at the gates to the back-storage where they register the boxes while they pass by.

It is important to understand however, that placing a barcode or RFID tag on each box does not solve the issue of deviation in the actual content, which is the next step the employee faces when the delivery is received. Our empirical findings show that deviations of the content of arriving boxes is a major issue to deal with as the stores indicate that this happens on a frequent basis. Accordingly, 58% of the stores interviewed have set aside personnel to deal with examining each box and correct potential deviations. When the content has been identified, the deviations are corrected in the system and thereafter corrections in the invoicing program needs to be conducted. All of these activities claimed to be very time consuming by the stores, even the most time consuming of all activities conducted according to some. Considering Lean and waste, this whole activity is overprocessing as described by Myerson (2014) & Melton (2005) since no value added can be seen in the perspective of the customer.

In a Lean perspective it is highly important with accurate inventory levels as indicated by Evans & Harrigan (2005) and Lukic (2012), and subsequently not having unnecessary inventory, which is another category of waste (Melton, 2005). If the inventory stated in the system does not match the reality, the replenishing becomes faulty, which explains why Intersport advocates that checking of content is justified. Thus, from a Lean perspective, it

would be beneficial to examine and count the content to make sure the inventory is accurate. Although, at the same time the whole procedure of identifying content must be seen as a waste activity and non-value adding to the customer and should accordingly be removed entirely. Even though, this study has let us know that Intersport is already working on the matter of decreasing incomplete shipments and further enhance model cohesion, the importance of even further improvements cannot be underestimated. Otherwise, another helpful tool would be, as mentioned earlier, an RFID system updating the inventory in real time and making the tag traceable, as explained by Mckinnon et al. (2007). Without doubt, there is much time to save for Intersport if discarding the identifying of content. However, it is hard to know to what extent, as the opinions between the stores differ wildly on the matter. Nonetheless it would serve as a proper opportunity for Intersport headquarters implementing a tool as RFID or improving the allocation at the distribution centre and thereby removing the task of identifying content.

5.2.2 Unpacking and registration

The next step considering unpacking is categorised as value adding as it is valuable for the customer to be able to see the products visualised in the store. The unpacking itself is not a major issue according to the back-storage personnel, even though the boxes are scarcely coded except for differences in tape used depending on replenishing or new orders. The back-storage personnel themselves express that their experience is a key factor to determining what is in the boxes, by considering size, weight, and touch to obtain a feeling they can, for instance, notice if the box contains shoes or textile. It is a different matter for personnel not so used to the delivery phase, however. As Lean advocate flexible tasks, it would be beneficial to colour code the boxes as suggested by Mckinnon et al. (2007) and thereby allow less experienced personnel to help unpacking and prioritizing, through cross-training.

However if looking at the content within the boxes, most stores agree that the current setup is poorly executed as it often happens that products and models are separated into different boxes, and thus it takes substantial time for the employees to find and allocate the products into model cohesion. Hence, as this searching and allocation does not provide any value to the customer it rather serves as overprocessing waste (Myerson, 2014; Melton, 2005). The majority of the stores do state that the model separation into different boxes from the distribution centre has decreased, although it is still a big issue and needs to be further dealt with. That is also in line with our analysis as it is clear that this needs to be continuously improved at the distribution centre to eliminate waste at the stores.

While focusing on the stores however, some stores prove to have certain best practices to mitigate the effect of model separation. They argue it is beneficial to open as many boxes as possible at the same time and thereby deal with one product at a time rather than focusing on one box at a time. From there on they unload the products in piles on the workbench to start prioritization. To open several of boxes at once requires substantial space at the back-storage, which for instance, Store H claim they do not have. Thus, they further emphasize the importance of dealing with the issue of space. As we see it, this process could be further improved with the 5S approach (Chiarini, 2012; Myerson, 2014). However, as the whole

activity of sorting into model cohesion is non-value adding to the customer, it should rather be a focus on removing the aspect entirely by improving packaging at the distribution centre to give the stores better conditions to work with. It is further admitted however, that this extra handling does mean that the employees have the opportunity to find potential damaged products at an early stage, although as this is seldom the case, we do not put any major relevance into it.

The empirical findings have shown that the point of time when products are being registered into the IT system differ widely from store to store. Some wait with this task due to various reasons, which seemingly results in non-value adding waiting time, or waste (Myerson, 2014; Melton, 2005), as it limits availability of products. In an availability point of view, it would be beneficial to register the content as fast as possible due to the products then being available in the inventory IT system. Our interviews with store personnel have revealed that the IT system search, conducted by store personnel at the counter, is a frequent occurrence in stores as they are searching for a specific product. It is estimated that each employee performs this activity several times per day when a customer asks for a certain product. When multiplying that with number of employees in each store it becomes clear that it is indeed frequently occurring, and therefore there are potential in improving the process of having products available, and searchable, in the inventory IT system. While many of these searches indicate that the product is not present at the store at all, there are also times when the product is available in the back-storage, although not yet located upon the shelf. Thereby store personnel may enter the back-storage area and ask for it, or look around for the product themselves. However, as stated by the majority of the back-storage personnel, it is not appreciated when store personnel come "digging around" since it may ruin the back-storage personnel's overview and control of what has actually arrived. However, products that is in a grey zone, where they are located at the store physically but not electronically, serves as waste (Evans & Mason, 2015). Therefore, we would encourage prioritizing making the content of the boxes available and registered, before doing all the attachments that are needed for visualisation in stores. This way, the products are still available even though they are not 100% ready-made with all supporting equipment attached, and we have found it is more important to the customer that they are at least available for consideration. The store personnel can easily attach a security tag (which is mandatory when transitioning from the back-storage area to the store space), and hand the product over to the customer directly. A way to tackle the issue of store personnel going to back-storage and taking products that are not yet registered could be a signal system with cards inspired by Kanban (Jacobs & Chase, 2014; Chiarini, 2012). This can serve as a way to signal if a product has been taken out of the un-registered boxes, which back-storage personnel thereafter accordingly can correct. Hence, an approach would be better communication using signal cards and emphasizing the importance of registering the content as early as possible.

5.3 Handling of goods back-storage

5.3.1 Attachments

As described in the empirical findings the majority of the stores conduct most of the attachments at the back-storage. It is indicated that most stores have specialized employees at specific tasks and thus responsible of handling certain operations. However, some stores are more flexible and have tasks conducted depending on current circumstances, which is in line with Lean theory by Melton (2005) and Liker (2009). Such flexibility makes it possible to switch employees depending on who is working and current amount of workload, which accordingly would be approved out of a Lean perspective.

Findings from this study reveals that 50% of the respondents say attaching of clothes hangers together with attaching security tags are the most time consuming factors. While considering these aspects out of a value stream perspective (Melton, 2005; Hines & Rich, 1997) it becomes clear that these aspects differ in terms of adding value. Attaching security tags does not, according to our findings, add value to the customer but is considered a necessity. Seeing as without security tags, especially in stores with high risk of theft, there would be limited products left for the customers to purchase. Consequently, attaching security tags is categorised as necessary but non-value adding. Attaching clothes hangers, on the other hand, can be stated to add value to the customer since the products are better displayed in the store. The visualisation brings value to the customer as it is thereby possible to quickly get an overview of different products, which would not be the case if, for instance, products would be displayed in boxes. With regards to the activity of attaching clothes hangers being value adding despite also being the most time consuming factor, it becomes clear that there lies potential in improving the current approach. Since several stores point out the advantages and potential time savings in terms of having clothes hangers already attached at delivery, outsourcing crystallizes as a reasonable and promising approach.

Outsourcing or not, our interviews and observations reveal that there are major differences in terms of working with these attachments between the different stores. While some stores have a more structure oriented thinking, many stores are currently having a back-storage space in disorder. Tools and functions are spread out and the back-storage is in general unstructured, messy, as well as dirty due to lack of time. Considering categorisations of waste, these activities results in motion waste or unnecessary movement (Myerson, 2014; Melton, 2005). One such example is displayed in one of the stores where the printer is located on the other side of the store, without any specific reason, resulting in movement across the store several times per day. Dealing with such issues is in line with what Myerson (2014) writes when describing a U.S. retailer saving huge amounts of resources by using a Lean Six Sigma approach and structuring initiatives such as moving the label printing to a more suitable location.

In general, the back-storage space would be suitably structured with the help of 5S (Jacobs & Chase, 2014; Chiarini, 2012). As a start each store should beneficially *Sort* and examine the current setup and remove things that are not useful to a process. Such example, as observed in

the stores may be old store equipment laying around taking up space. From there on it is necessary to *Set in place,* which may be done by structuring the workbench in the middle of the back-storage space as recommended by the more structured stores. As of such, unnecessary movement is decreased and there is more room to work from both ends of the bench, unlike the case when the bench is fixed to a wall. The workbench should also include containers for security tags and clothes hangers easy at hand beneath or above the table to further eliminate wasteful movements and searching for adequate security tags or clothes hangers. Preferably, there should also be visual guidelines attached at each workbench illustrating how activities should be performed. This would incline that fairly inexperienced personnel more easily could get a grasp of the activities and thus increase the flexibility of the work force. Next step would be *Shine* where the personnel should aim to clean the stores and regularly keep the area clean. This is currently neglected and it results in an unpleasant environment to work in, as explained by Store L. The next step, *Standardisation*, penetrates the entire organisation of Intersport and we see standardisation possibilities almost everywhere as each store is working differently. A start would be to standardise what products should actually be located on hangers, seeing as we have found uncertainty from the back-storage personnel in the matter. There are times when hangers have been attached back-storage, and then later been removed by store personnel, as it should be visualised folded on a table instead. Such redundant activities are clearly leading to overprocessing waste and should be removed through clearer guidelines and standardisation (Myerson, 2014; Melton, 2005). Lastly, these improvements and changes need to be *Sustained* by making sure the improvements are fortified and not neglected. One way would be to implement sessions where employees work with continuous improvement, also known as Kaizen (Liu, 2012).

The attaching of price tags has shown to exclusively be conducted at the back-storage. It is currently identified as a very time consuming issue as the stores currently need to print new price labels every time they are missing, which occurs frequently, or when the price has been updated, which continuously occur as well. While returning to the past statement of an RFID system, we see this as a suitable tool when it comes to managing price labels, as well as security tags. As suggested by one of the stores, and certainly a concept stressed in the theoretical framework, price tags could be removed entirely by replacing them with a barcode or an RFID tag where the price is included and thus allowing for making corrections electronically instead of manually on a written price label, which is currently the case. In terms of visualising the price to the customer, the price for each product could instead collectively be shown by one large sign at the designated exposure area. Thereby, it would be much easier to correct when prices change, and there would be no need to correct the price on each individual product. Moreover, the same RFID tag may serve as a tag against theft, replacing the current security tags that are manually attached. Instead, one tag may serve all the functions of identifying content, providing real time data of inventory, displaying price at the checkout counter and functioning as a security tag as proposed by Evans & Harrigan (2005) and Lukic (2012).

In a short-term perspective, Intersport needs to get rid of the issue with products reaching the customer without price tags attached, as it results in products not attaining the customer

expectations (Pepper & Spedding, 2010). Thus, these products may be categorised as defects waste since they are not meeting customer requirements (Myerson, 2014; Melton, 2005). Preferable, all products should have price labels when arriving at the store. However as that should be the case, but it is currently not, it would be suitable to investigate this aspect of quality flaws, by using Lean Six Sigma (Pepper & Spedding, 2010; Myerson 2014). Lean Six Sigma, combined with Jidoka quality thinking may raise the quality and thereby incomplete products reaching the customer (Slack et al., 2010). As of such the DMAIC cycle may be used where it is clear to *Define* that faulty products are reaching the customers and *Measured* by the fact that all stores agree that it is a frequent happening that price is not attached when products are delivered. In terms of *Analysis* it is identified that products with non-existing price reaching the customer is a result of malpractice with processing at the distribution centre in combination with lack of checking at the back-storage. *Improvements* could be done by correcting the process of price labelling or implementing RFID. In line with other changes, there is afterwards a need of *Control* to monitor the progress (Myerson, 2014).

5.3.2 Dispatching goods after unpacking

As described in the empirical findings, the stores have some different approaches in terms of dispatching products to the store areas and making them available for purchase. Moveable carriers with bins underneath serves as the best identified way as it is thereby possible to locate products both hanging, and products laying underneath. In addition, it is possible to role more products out to the store at the same time decreasing waste activities such as unnecessary movement (Myerson, 2014; Melton, 2005) when going to the back-storage collecting bins and moveable carries separately. This approach also decreases the amount of space needed, since the moveable carries with bins underneath take less space at the back-storage than what a moveable carrier and bins would do separated.

As a consequence of stores operating differently in terms of doing attachments in different locations, the shape of the product when being dispatched also differs. In some stores the products are completely ready-made with everything attached when being dispatched, while in some stores they are only unpacked, which adds a lot of work to be done in-store. We have seen that it is essential that stores have a working transition between the back-storage and the store as results show that products may end up pending at the back-storage for quite some time as described by Store H, even though they are ready for the store, which results in unnecessary inventory (Myerson, 2014; Melton, 2005).

5.4 Transition back-storage to store

5.4.1 Making products available for customers

The transition process is, as most other activities, handled with great variation across the different stores. As stated in the empirical findings, 67% of the stores conduct the transition of products between back-storage and store through discussion and confirming with the different personnel. Either by store personnel going to back-storage to ask for products to take out or back-storage personnel going in-store and letting the store personnel know that there are products ready to bring out. However, results have shown that in the majority of cases,

confirmation between the different areas is necessary. Consequently, if a representative from an area are not present, confusion arises and no one can tell what products are allowed to bring out to the store and what additional tasks that needs to be performed. A few of the stores have, in line with our appreciation, installed dedicated areas where products are displayed as pending to be transferred into the store. Hence, no confirmation is needed for the products to be brought out and the dedicated areas reduce risk of personnel failing to notice products that should be brought out. As a suggestion, these dedicated areas should be implemented in all stores where they serve as Kanban squares, signalling products that are ready to be brought out (Jacobs & Chase, 2014; Chiarini, 2012).

From there on it is essential to establish a routine at the stores where store personnel regularly visit the dedicated areas to overlook if there are products to bring out. This is in line with making sure products are not forgotten at the back-storage and pending there longer than absolutely necessary. Our observations have shown that the layout of the stores and way of working differ wildly, it is thus preferred that the stores try to obtain standardisation in Kanban squares as far as possible (Liu, 2009). Preferably the areas should contain ready made products, although as there are stores where most attaching are conducted in-store, the squares might contain products that are only ready for additional attachments. The crucial point is that they must be registered in the inventory IT system and be ready to leave the back-storage.

Limitations in space and characteristics of the room may justify varying placement of the squares according to circumstances. For instance, Store I have a dedicated area within the store itself where new products are placed temporarily and thereby can be taken care of by store personnel whenever possible. In addition, at the same time they are accessible for the customer, who often finds these products interesting, as it is clear they are new and distinguished from the other. We find this solution to be the most promising as it make the product available for purchase even though it is in a temporary position. Nonetheless, it may serve well to have a dedicated Kanban square at the back-storage, well in line with Store F, which have a dedicated shelf signalling products that are ready to be brought out. All in all, we are picturing dedicated Kanban areas within the store itself, or at the back-storage, that are continuously being checked by store personnel for products to be rolled out, without any need of confirmation. These implementations will serve to shorten the lead time of products reaching the customer and eliminate waiting waste in accordance to Myerson (2014), Melton (2005) and Evans & Harrigan (2005).

5.4.2 In-store activities

It has become clear that many stores successfully perform the bulk of attachments of clothes, hangers and security tags in-store. When arguing for whether attachment of supporting equipment should be performed in-store or at the backs-storage it is important to understand that these activities are performed during idle time, when there are few customers in store. The stores express how it can be conducted meanwhile overseeing dressing rooms or waiting for customers and at the same time being available at the checkout. Therefore, it can in some regards be seen as a way to deal with necessary waiting time for store personnel (Myerson, 2014; Melton, 2005). However, there are other activities that can be performed in-store during

idle time such as sorting the store inventory and cleaning store areas. Consequently, even though the in-store attachments are currently serving as a good complement for store personnel in those stores where it is conducted, it does not mean that there are no activities left if it would be conducted elsewhere.

Out of a Lean perspective, we argue that a flexible approach should be maintained in accordance to Melton (2005) and Liker (2009). By cross-training staff, the store personnel and back-storage personnel will not only be able to support each other in the variable working environment, but also gain a greater understanding of each other's tasks, which will be helpful in their everyday work. As such, communication will be more efficient between departments, and they can help each other with various tasks as well as tend to make the process run more smoothly. It is important to understand that cross-trained personnel is not to be made as a substitute for full time employed staff in each area. It should rather be considered a complement during for example peak season, or certain marketing campaigns, where store personnel could help out with back-storage tasks, or back-storage personnel could support the store activities.

5.5 General findings

As stated in the general findings of previous part, this study includes results that are not naturally divided into one of the three areas specified above. These are surrounding factors, not necessarily performed within the store itself, but to a high extent affecting the work that is taking place in the store. In the empirical findings, the packaging done at the distribution centre was mentioned as a major factor since it is poorly done, lacking model cohesion and missing products, which leads to time consuming aspects at the stores. Analysing our results, we further emphasize the importance of improving the packaging, as our empirical findings reveal the major consequences it implies in terms of checking content, correcting deviations, correcting invoices and re-printing price labels. Thus, even though it lies outside the stores control, and thereby outside the scope of this thesis, we find it necessary to mention as a current source of waste activities. While considering factors outside the store, there are also some Lean implications that need to be implemented in the Intersport organisation as a whole, not only within the stores. It is important to understand, that in order to stay Lean, the leaders of the organisation need to be the change guardians and have a long-term perspective and make sure the work with Lean is continuous (Hines et al., 2008; Bhasin & Burcher, 2006). Otherwise, we find that there is a major risk that the stores themselves lose track of their own improvements, and after a while, fall back to old habits, instead of keeping to the new processes as explained by Hines et al. (2008) and Melton (2005). Hence, it is necessary that the managers keep monitoring the improvements and processes and champion the changes. The stores themselves may beneficially work with Kaizen-sessions (Liu, 2012) to make sure that the Lean work is not neglected and that there are continuous attempts to improve the daily work.

In the theoretical framework it is explained how the House of Lean illustrates that Lean contain different aspects that should work together in order to be effective (Liker, 2009). Consequently, Intersport as an organisation needs to absorb the whole picture of Lean. So far,

we have not touched upon the foundation of the house, namely Heijunka, which aims to level out the flow and decrease variability. While this is not, to a large extent, possible to affect within the store itself, it is truly essential and cannot be neglected in this study. As of now, large variability (Mura) exists in the flow of products to the Intersport stores, which leads to overburden (Muri) at certain periods of time, and waste (Muda) in terms of unnecessary personnel at times when there is a limited flow of products (Hines et al., 2008). Hence, even though it is natural for Intersport to have cyclical seasons with different products, it is essential to further emphasize the importance of levelling out the flow. This would be beneficial since it is clear that the variability of the flow is a large factor at the stores where it is indicated that issues arise when for instance large shipments with products for the new season arrives, such as when the bikes arrive for spring. Thus, even though there is an understanding of the challenges in having a constant flow of products due to the cyclical seasons, Heijunka and a more stable flow would greatly serve the efficiency at the retail stores.

Moreover, in the theoretical findings Bhasin (2012) states that some of the most common reasons to failing with Lean are people-related, involving limited communications and opposition of employees. To tackle the issue of opposition, it is important that, as mentioned, the managers of Intersport champions the Lean initiatives and explain the reasoning behind them and the result it may reveal. Accordingly, communication will serve as a tool to mitigate opposition. The aspect of communication, namely internal communication, has been widely mentioned as one of the success factors expressed by the stores themselves. The successful internal communication that the stores currently apply will serve well to prosper Lean initiatives and prevent failure. However, as some stores mention, it is argued that the communication with the headquarters needs to improve. Results indicate that there is a need for clearer guidelines as to what questions should be forwarded to whom and quicker response time from the Headquarters. To successfully implement Lean, the communication needs to penetrate the whole organisation, not only the stores, as described by Hines et al. (2008) in the iceberg model seen in *Figure 8*.

Last of all, it is essential that Intersport is targeting their own approach of Lean, and not follow other reported successful cases too strictly (Hines et al., 2008). An example of this can be seen in the case of Tesco, *Figure 4,* where no local changes to routines are allowed (Evans & Mason, 2015). Although Intersport clearly has huge potential in standardising routines across the stores, we find it necessary also to maintain the local initiatives. We argue that maintaining local initiatives is essential in a retail environment where each store differs dramatically in conditions of work, including differences in everything from space to employees. From the empirical findings, it is clear that the experience and initiatives from the back-storage personnel and store personnel is a great source of knowledge that should be leveraged to the highest extent. Thus we find that local creativity, such as coming up with specialised solutions can very much be considered a strength in these cases. Conclusively, the physical stores are important. Despite increasing e-commerce, the stores will still be a vital part, for instance, by driving consumer preferences and marketing initiatives as described by Aubrey & Judge (2012).

5.6 Prioritising initiatives

Concluding the analysis, it is clear that there are certain measures that can be taken from Intersport's perspective to improve the efficiency. These actions differ in terms of potential impact it will have on the store as well as the resources required to implement the improvements. Therefore, we have conducted a rough valuation to easier prioritise potential initiatives. The initiatives have been grouped together into summarized actions to further simplify the prioritising and enhance understanding.
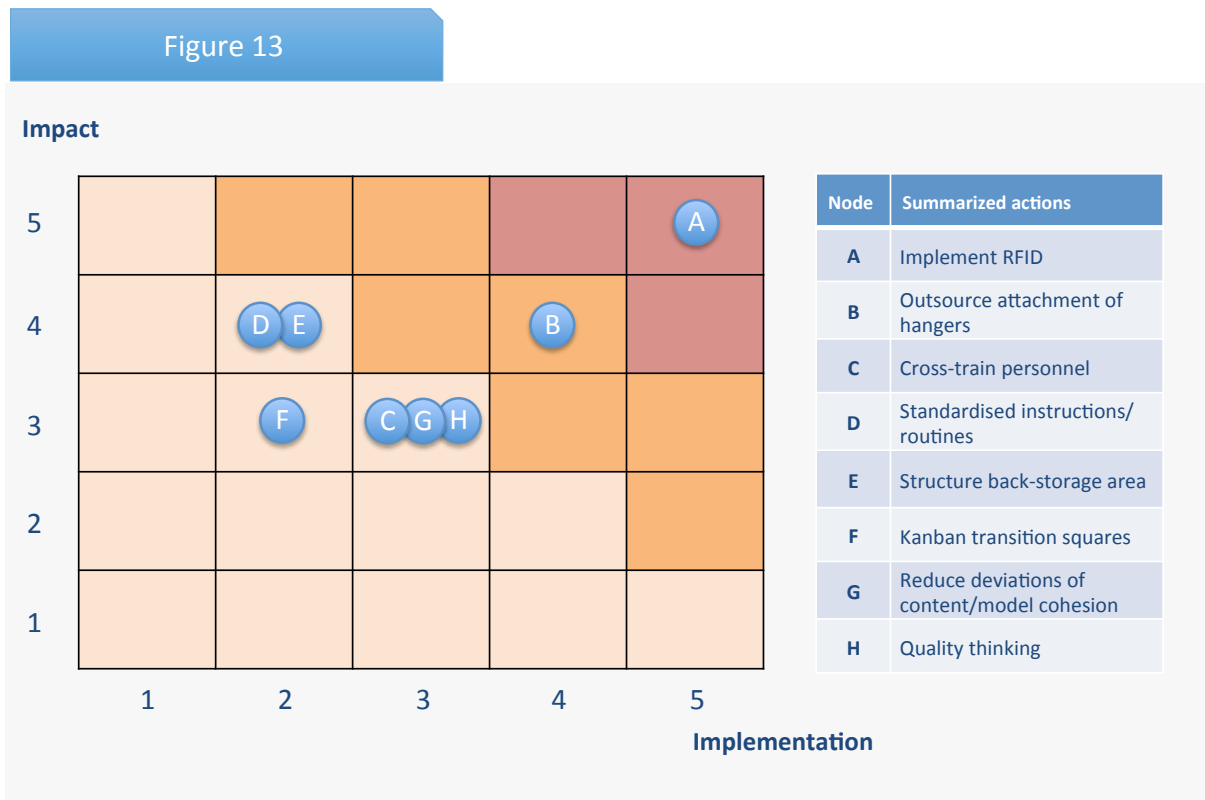

Figure 13: Valuation matrix for prioritising initiatives, Source: Own developed model

Certain aspects, such as standardising routines does not require a lot of extra resources except for personnel time to implement, hence it also scores lower on required resources and can be faster implemented without substantial thought. Outsourcing and implementation of RFID, on the other hand, requires negotiations with suppliers, new technology, in depth change management and so forth, which accordingly scores higher on the coefficient. As such, the aspects entail different time frames and wholly different requirements. In the recommendations part of the conclusions we will further discuss these aspects more in detail and an implementation model will be presented (*Figure 16)*.

6. Conclusions

The following chapter present the conclusions that have been drawn after putting the empirical material against the theoretical framework. Moreover, the research question and the purpose of this thesis are revisited, and suggestions for further research are given.

6.1 Recommendations

In this section we will conclude our analysis and bring forth recommendations to answer our research question:

How can Intersport improve their supply chain efficiency at the physical stores?

The recommendations stated in this chapter are based on the material developed from combining our theoretical framework with the empirical findings. The following updated illustration serves as a recommended guideline as to how Intersport may structure their work in order to successfully make the internal supply chain of the stores more efficient in regards to the Lean philosophy.
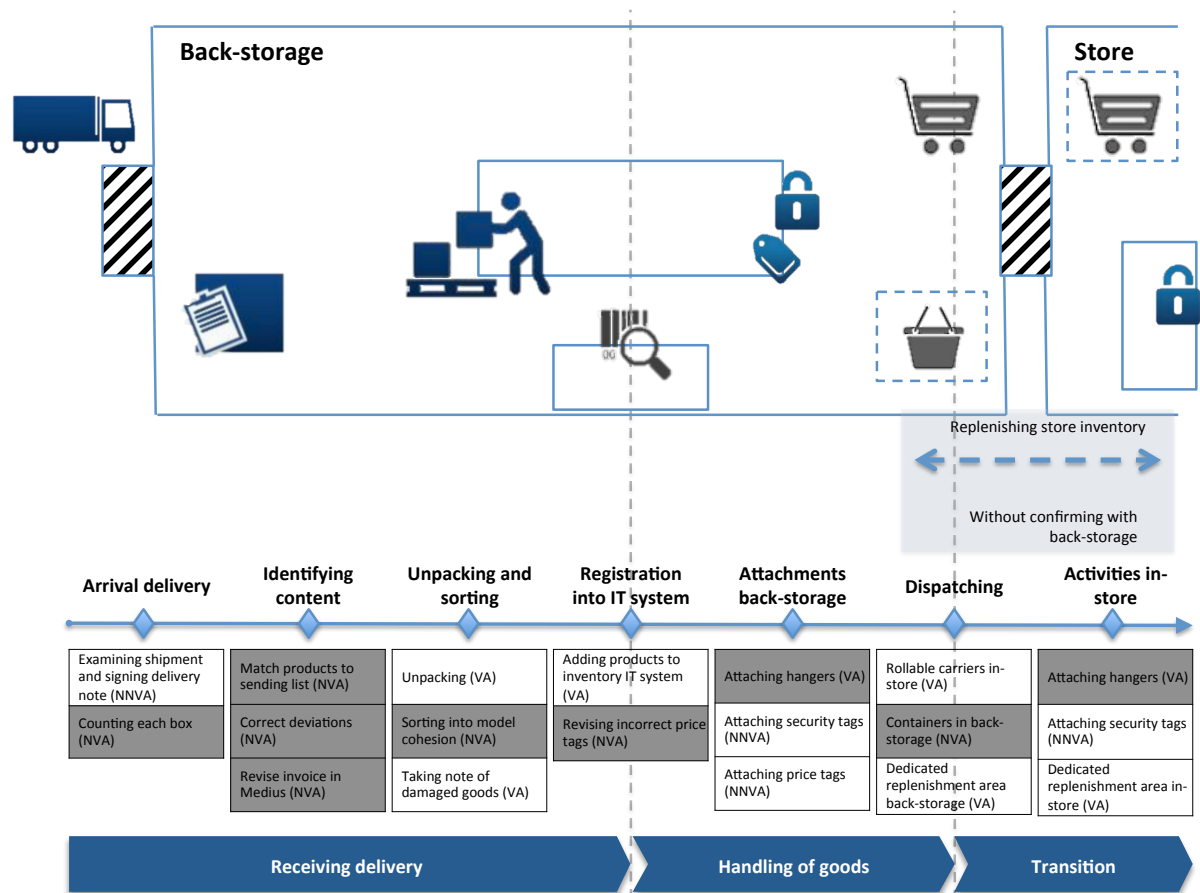

Figure 14: An illustration of a recommended process, Source: Own developed model

The rectangles that are coloured dark grey in *Figure 14* (exhibited above) are the tasks we wish to subtract from the process, as they add no direct value. The following sections of this chapter will discuss these non-value adding activities.

As stated in our analysis, there is a need to eliminate waste in the receiving delivery part of the process. Intersport should work actively with measures to remove the activity of counting each box at delivery, as it does not add any value and is particularly time consuming, especially in the larger stores. In the long-term, this can be done by the use of RFID tags, or in a shorter time scope by improving the collaboration with the delivery firm and demanding error free deliveries, thus removing the aspect entirely. Moreover, it is crucial that Intersport aims to remove the part of identifying content as this activity, with all tasks included, takes a huge amount of time. From a Lean perspective it is vital that each box contain the correct products, as quality is a main factor. Consequently, as of now we recommend that the personnel check the goods to make sure the inventory is accurate and thereby that the replenishing is accurate as well. However, as there should not be any need of conducting these checks in the first place, the packaging must be improved at the distribution centre to make sure the error rate is at such low levels that the errors do not have any large effect and thus no checking is justified. If the future come to show that improvements at the distribution centre has not been reached, it would be essential to exploit RFID technology at the stores where a passive transmitter will do the checking automatically and log everything entering the store. Furthermore, when talking about packaging, it is not only a matter of accuracy errors, but also about the way the boxes are packed. We have found that it is essential to improve the way the boxes are packed, as well as to make sure products are better sorted into model cohesion within the box. Accordingly, Intersport could remove another time consuming aspect of sorting the content at the store and, as a result, improve efficiency. Concerning the registration into the inventory IT system, we argue that it is essential to conduct this activity as early in the process as possible. As a suggestion, standardised instructions should be provided to the stores where it is indicated that registration of new deliveries is the first task to be conducted after arrival. In addition, a Kanban signal system should be introduced to help indicate when store personnel have removed a certain product.

When it comes to the handling of goods back-storage, there are certain measures to be taken. First of all there is a need to structure the back-storage with a 5S approach, as there are in many cases today an unstructured and cluttered environment. This leads to unnecessary lead time as products are neglected simply because they cannot be found or are overlooked by mistake. As indicated in the illustration in *Figure 14*, the workbench should preferably be placed in the middle of the working area with bins containing unused hangers and security tags on top of or beneath the table to have them close at hand and save space. By having the workbench located in a central open area, personnel can perform tasks from both sides of the bench, with space left for extra personnel to work when called in at time of need. The idea of an open workbench with a lot of extra space should be leveraged further by allowing for cross-training of personnel. As such, cross-trained personnel from the store can come in and relieve the back-storage staff whenever needed, and to further enhance this, standardised instructions should be kept visible nearby for less experienced personnel to conduct the work

properly. The activities of attaching supporting equipment should be changed as well due to the substantial time each moment takes. Clothes hangers have been identified as value adding and should accordingly be kept in the process. However, as it is recorded as the most time consuming aspect, Intersport should consider the possibility of outsourcing the attachment of clothes hangers to an earlier phase in the value chain and thereby decrease lead time and cut costs in-store. The attachments of price labels and security tags should beneficially be replaced by one single RFID tag, which could serve both purposes. Additionally, we recommend standardising the equipment at the back-storage. As a suggestion, moveable carriers with both hanging opportunities and bins attached should be implemented as it serves as a suitable tool in carrying many products as well as saving space at the back-storage.

Concerning the transition back-storage to store, certain improvements are recommended. The process of bringing products out to the store and make them available for purchase is clearly lacking in many stores today. Hence, we recommend Intersport to structure the process and introduce standardised routines where store personnel regularly check for products to bring out without the need of confirming with back-storage personnel. It should be made a routine that the checking should be conducted of certain dedicated areas where back-storage personnel put products ready to be brought out to the store. We find that preferably these dedicated areas, namely Kanban squares, should be placed in-store, as the products are then available for customers to purchase. If there are certain limitations, in terms of special conditions of the store, we find it justified that these areas are kept in the back-storage, as long as they allow for a smooth transition of products from back-storage to store. Furthermore, we find the fact that some stores, according to their certain conditions, conduct the attachment of supporting equipment in-store to be a beneficial opportunity, as we emphasize a flexible cross-trained workforce. The main point is that these activities may serve as a beneficial complement to sales and customer interaction as long as it does not take time away from serving the customer.

When it comes to general findings, we would like to point out the importance of communication. At the stores where communication is already a key success factor, it needs to be encouraged and maintained. Regarding the communication between stores and the headquarters we would recommend to establish closer contact not only with stores in a closer geographical area, but making sure to include all kinds of stores. As a suggestion, new clear guidelines should be sent out to the stores regarding which person to contact for which errand or issue. It would be beneficial to have a certain key contact for each store at headquarters that could serve as a link between the dedicated stores and further contact at the headquarters. Internally, the importance of faster response rates to questions directed from customers through store personnel should be further emphasized, as the empirical findings show the importance of customers getting a quick answer. Furthermore, it is of absolute necessity that the managers at the headquarters champion the Lean initiatives of improvement and make sure they are carried out properly. Generally, with a Lean perspective in mind, we want to emphasize the potential for further standardisation in the whole process and decreasing variability. At the same time we point out the need for leveraging the incumbent experienced personnel and enhance successful local initiatives on a national level.

Figure 15: Breakdown of short-term recommendations

Receiving delivery	• Remove the non-value adding activity of counting each box at delivery by collaborating and demanding correct shipments by delivery firm • Remove the time consuming activity of identifying content by improving packaging at the distribution centre to eliminate errors • Investigate potential of implementing a RFID system to handle checking and identifying of content • Further improve model cohesion of the content • Introduce standardised instructions for registration into inventory IT system and aim to register products right after delivery • Implement a Kanban signal system to help indicate when store personnel have removed a certain product from back-storage
Handling of goods back-storage	• Structure the back-storage area with a 5S approach • Strive to place the workbench in the middle of the working area with bins containing unused hangers and security tags on top of or beneath the table • Keep standardised instructions clearly visible at the workbench for the performing of attaching activities • Cross-train personnel in basic back-storage and in-store tasks • Consider the possibility of outsourcing attachment of clothes hangers • Aim to replace price labels and security tags with a multifunctional RFID tag • Standardise the equipment back-storage with functional moveable carriers
Transition back-storage to store	• Introduce standardised routines where store personnel regularly check for products to bring out without the need of confirming with back-storage personnel • Implement dedicated areas (Kanban squares), either in-store or at the back-storage depending on store conditions, where back-storage personnel put pending products on moveable carriers
General findings	• Encourage and maintain the importance of internal communication • Send out clear guidelines to the stores regarding which person to contact for which errand or issue • Introduce a key contact for each store at headquarters that could serve as a link between the dedicated stores and further contact at the headquarters • Further leverage the incumbent experienced personnel and enhance successful local initiatives on a national level • Make sure managers champion the Lean initiatives • Strive to level out the flow and decrease variability of products (Heijunka)

Figure 15: Breakdown of short-term recommendations, Source: Own developed model

6.1.1 Implementation model

While some of our recommendations can be seen as more direct and manageable in a short period of time, there are also those that are more costly in terms of time and resources. In the last part of the analysis we presented a valuation matrix (*Figure 13),* where certain summarized initiatives were valuated in terms of impact and resources required. In the following illustration we have broken down these initiatives into more detailed actions as well as given a recommendation on when these implementations may be conducted considering a time scope of a few years. What is important to understand is that the change management part of implementing these changes does not stop after a few years, but is an on-going process with the vision of achieving a more efficient and Lean internal supply chain.
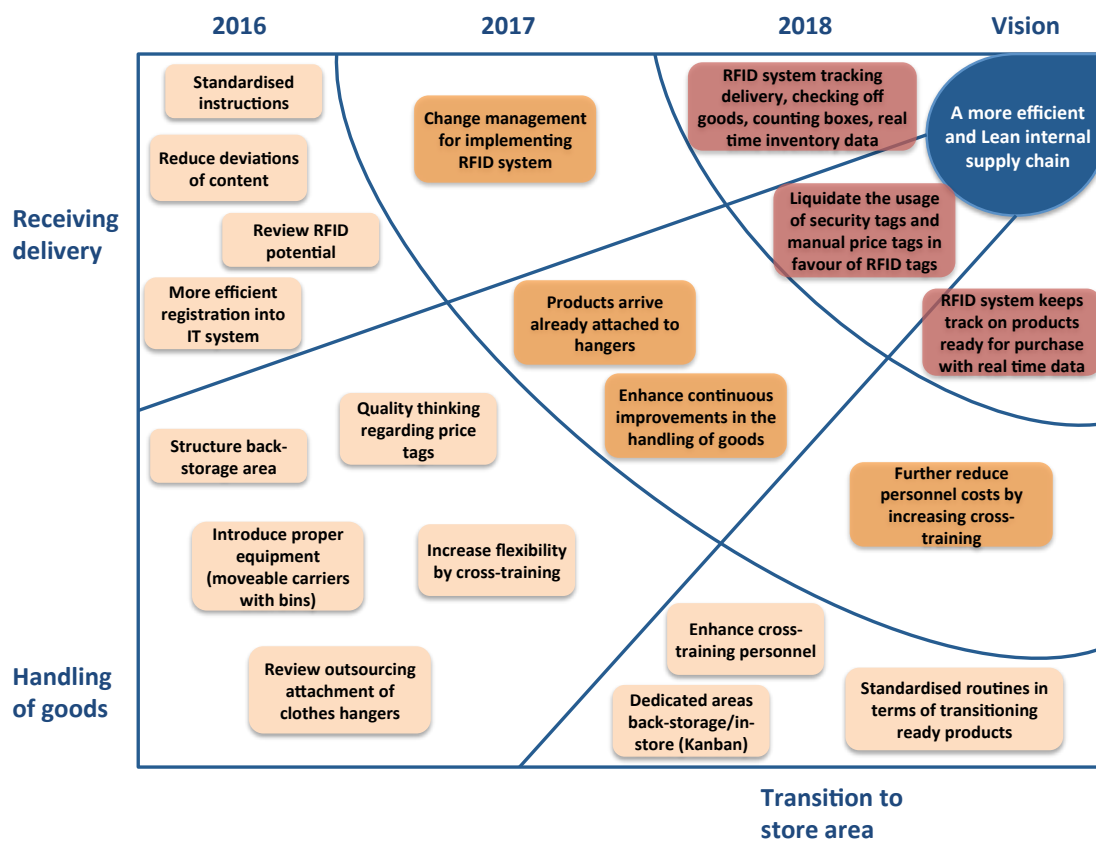

Figure 16: Implementation model, Source: Own developed model

As can be seen in the illustration above, we give certain recommendations to implement in each stream for the coming years. This can be considered a crude suggestion to give an example of what could be done and in what order. The colour coding emphasizes the rate of urgency, pointing to what needs to be done initially for further actions to be possible. In the first year it is important to deal with the imminent issues of the process, as well as build a solid foundation for further improvements. The second year is mostly concerned with maintaining and enhancing on-going changes, and to implement changes that have been investigated for potential benefits the year before. The third year, and onward, present an idea of a fully functional automated RFID system with passive trackers handling a lot of activities

that in the past had to be manually performed. As mentioned, it is truly vital to think of this implementation as not something set in stone, but instead a guideline as to how Intersport can reach a more efficient and Lean internal supply chain.

6.2 Theoretical contributions

In the introduction of this thesis, it was explained how Lean is a well-known philosophy where many practical cases exist, especially within manufacturing. However, as argued, there has been limited literature about Lean in a retail supply chain, and especially with the focus upon the retail store. Literature about Lean in retail covers the entire supply chain and emphasizes aspects such as closer collaboration between suppliers and ways to conduct purchasing in order to eliminate waste handling. This study, on the other hand, gives deep insight how Lean philosophy can be applicable on the store itself and clearly demonstrate a practical case in the Swedish retail sector.

Even though cases such as Tesco (*Figure 4*) reveal how Lean may be applied in retail, there are no indications of the stores themselves giving their opinion on the matter. Rather it is explained as a reality seen by the managers or experts entering the organisation of Tesco. Thus, this study adds on some additional knowledge with the case of Intersport where the entire perspective is being covered, including the headquarters, distribution, and especially the stores. We find the stores to be a vital part and important to emphasize, as it is the actual personnel who performs the activities on a daily basis, and thus get the chance to contribute with their experience. Accordingly, since interviewing the operational personnel, we find that the result is reliable and close to reality. Hence, this study can be said to fill an important gap in Lean literature with regards to retail stores.

6.3 Further research

This study has aimed to give a deeper insight into Lean retail by performing a case study of Intersport. While this is an in depth description of a single case study examining Intersport, it would be of great academic interest to further perform multiple case studies on the subject. By doing so, it may be revealed whether these findings only conclude to the specific case of Intersport, or if it may be representative for the Swedish retail sector in general. This is further encouraged by the fact that we have discovered that Lean in retail generally focus upon the whole supply chain, meaning that there are further needs of case studies like this to reveal the whole picture of Lean retail initiatives in-store. However, it is also important to remember that, even though this study has been limited to the stores, the whole supply chain is of substantial interest. If this study, through further research, would be expanded to the whole supply chain, it would be more closely comparable to other Lean studies.

Moreover, it would also be suitable to conduct a study of the implementation as well as a post-implementation study. The theoretical findings express how Lean, like organisational changes in general, can be hard to implement and also maintain once implemented. Accordingly, it would be of great theoretical as well as practical interest to follow up on this study and compare eventual challenges with implementation towards other case studies of

Lean and change management. As of such, theory in the future may be able to contribute with more detailed recommendations following Lean initiatives.

In Intersport's perspective, many small corrections can in the short-term be done to improve efficiency, while in the long run we have identified implementing an RFID system to be able to add major potential. Accordingly, it is suggested to conduct a closer study on the RFID implementation. It would be of great significance to give closer indications of the required technical specifications and cost analysis of different approaches. As a suggestion, further research could beneficially study companies similar to Intersport, and their attempts to applying an RFID system to learn lessons from it. For instance, valuable lessons could be learned in terms of implementation and change management, but mainly on how RFID technology have improved, or worsened, certain aspects in the daily store environment. The same applies for the aspect of outsourcing, where a closer examination is needed to find the most suitable approach.

7. References

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8. Appendix

8.1. List of interviews

Intersport store – Alingsås. Pre-study Interview with store personnel. [Interviewed by: Carlsson, R. & Gräsberg, A.] Alingsås, 2016-01-27

Distribution centre. Pre-study Interview with 3PL Specialist. [Interviewed by: Carlsson, R. & Gräsberg, A.] Landvetter, 2016-01-27

Intersport store – Jönköping/A6. Pre-study Interview with store personnel. [Interviewed by: Carlsson, R. & Gräsberg, A.] Jönköping, 2016-01-28

Intersport store – Borås. Pre-study Interview with store personnel. [Interviewed by: Carlsson, R. & Gräsberg, A.] Borås, 2016-01-28

Intersport Headquarters. Pre-study Interview with Supply Chain Manager. [Interviewed by: Carlsson, R. & Gräsberg, A.] Göteborg, 2016-01-29

Intersport store – Nordstan. Pre-study Interview with store personnel. [Interviewed by: Carlsson, R. & Gräsberg, A.] Göteborg, 2016-02-02

Intersport store – Helsingborg. Interview with store personnel. [Interviewed by: Carlsson, R. & Gräsberg, A.] Helsingborg. 2016-03-14

Intersport store – Malmö. Interview with store personnel. [Interviewed by: Carlsson, R. & Gräsberg, A.] Malmö. 2016-03-14

Intersport store – Linköping. Interview with store personnel. [Interviewed by: Carlsson, R. & Gräsberg, A.] Linköping. 2016-03-21

Intersport store – Stockholm Liljeholmen. Interview with store personnel. [Interviewed by: Carlsson, R. & Gräsberg, A.] Stockholm. 2016-03-21

Intersport store – Stockholm Barkarby. Interview with store personnel. [Interviewed by: Carlsson, R. & Gräsberg, A.] Stockholm. 2016-03-22

Intersport store – Örebro. Interview with store personnel. [Interviewed by: Carlsson, R. & Gräsberg, A.] Örebro. 2016-03-22

Intersport store – Alingsås. Complementing phone interview. [Interviewed by: Carlsson, R. & Gräsberg, A.] Göteborg. 2016-03-29

Intersport store – Jönköping. Complementing phone interview. [Interviewed by: Carlsson, R. & Gräsberg, A.] Göteborg. 2016-03-29

Intersport store – Nordstan. Complementing phone interview. [Interviewed by: Carlsson, R. & Gräsberg, A.] Göteborg. 2016-03-30

Intersport store – Borås. Complementing phone interview. [Interviewed by: Carlsson, R. & Gräsberg, A.] Göteborg. 2016-03-31

Intersport store – Umeå. Phone interview with store personnel. [Interviewed by: Carlsson, R. & Gräsberg, A.] Göteborg. 2016-03-31

Intersport store – Skellefteå. Phone interview with store personnel. [Interviewed by: Carlsson, R. & Gräsberg, A.] Göteborg. 2016-03-31

8.2 Interview guide

– Present yourselves, and the purpose of the thesis.

– Start out with some general questions, to build rapport.

– As an introduction and to gain an overview of the store, ask to be shown around the back-storage and store areas: *Can you please describe and show us the process from delivery to when the products reach the shelves? (If possible, please show the approach at each activity)*

8.2.1 Questions to back-storage personnel

Incoming supply flow:
- How many deliveries do you receive per week, and how many kolli per delivery?
  - In what shape are the kolli delivered? Pallets, cartons, boxes etc.
- Where are they dropped off? (Back-storage or through the store)
  - Are all deliveries dropped off at the same place?

Unpacking of products:
- How many employees have the task of unpacking products?
  - What days of the week are they tasked with this?
- Where is the unpacking being done? (Back-storage, or in the store)
- What do you think of the condition the products are delivered in?
  - Model cohesion? Redundant packaging? Damaged boxes?
- How is the unpacking being prioritized at delivery?
  - Any particular order?

Handling of delivery/registration:
- How is the process of checking the delivery and registering the delivery into the IT-system conducted?
  - Is there sometimes a mismatch between the delivery note and actual delivery?

- Are the products marked with price tags when delivered?
  - How do you deal with eventual deviations from this?

In-store lead time:
- Which activity/activities do you identify as the most time-consuming in bringing the product to the shelf in store?
- Would you describe a certain aspect as a bottleneck in the process that delays the other activities?
- Where specifically are the different activities conducted? (E.g. attaching security tags)
  - Do you have any specific instructions of how to conduct these activities?
- What do you think about the space in the back-storage? (The structure, shape etc)

Additional:
- What is your opinion of the different tools and appliances available in the process?
  - Do you find anything missing in this process?
- What aspects are you currently most satisfied with/what works properly at the moment?
- What do you think of the communication within Intersport?
  - Do you for example know who to contact for different matters?
- Anything else you would like to add? (Any specific points of view or areas of improvement)

8.2.2 Questions to store personnel
- What are your daily tasks?
- Do you take part in the attaching of supporting equipment, such as security tags and clothes hangers?
- When a product is out of stock on the shelves, what do you do?
  - Initially, how did you come to notice that it is out?
  - How often does this happen?
- When a customer comes up to you asking about a product that is out of stock on the shelves, what do you do?
  - How often does this happen?
- How do you use the product register (Inventory IT system) to find products?
- How are you met by the personnel at back-storage when asking about products that are out on the shelves?
- Anything else you would like to add?