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Closing the Value Chain Loop in the Apparel Industry  
- A case study of current practices  

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Preface

As a start, we would like to thank everyone that have taken part and contributed to this research project. First of all thank you Michael Lind, Patric Wallertz, Fredrik Wikholm, Lars Johan Hedberg, Magnus Wiberg and Anna Heinrup at Uniforms for the Dedicated who patiently answered all our questions. Second, thank you Elin Larsson and Christina Muljadi from Filippa K, and Ellen Niklasson from Studio Re:Design. Without all of you, this research would not have been possible to conduct.

Of course, we would also say a special thanks to our advisor Jonas Larsson, who guided us through the process.

Last, but not least we would like to thank our opponents who gave us valuable tips and discussions, which brought the research forward.

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Abstract

Title: Closing the Value Chain Loop in the Apparel Industry

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Key words: Circular economy, sustainability, supply chain management, value chain management, textile industry, apparel industry, re-imagine, reduce, reuse, repair, recycle

Purpose: The purpose of this research is to explore current practices regarding circular economies in the apparel industry and to construct a framework for integrating circular economy practices in the Swedish apparel industry.

Methodology: With a constructionist view and an abductive approach the purpose is to be achieved through two qualitative case studies. The themes identified were analysed and interpreted.

Theoretical perspectives: The theoretical framework is based upon a business context, on the basis of the textile management in general and logistics, recycling, sustainability and reverse systems in particular.

Empirical foundation: The empirical material consists primarily of 9 in-depth semi-structured interviews with various roles at Uniforms for the Dedicated and Filippa K, as well as through a Skype interview with the project manager of Re:Design Studio. They have been asked to talk about their view of sustainability, their practices and future developments.

Conclusion: When integrating circular practices in the value chain the authors have identified five main areas that should be integrated, in order to develop towards a circular economy: re-imagine, reduce, reuse, repair and recycle.
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1. Introduction

The introduction chapter aims to introducing the subject, the contemporary importance as well as the problem background. This will lead to a starting point where a research gap has been identified. The research purpose and questions are then presented.

1.1 Development in the Contemporary Business Society

During the international environment convention in Stockholm in 2012, Corporate Social Responsibility was the topic discussed. Focus was put on how companies can combine economic, social and environmental interests in order to decrease the negative effect on the planet (Bred agenda på miljömötet i Stockholm 2012). The World Commission on Environment and Development have developed a definition of sustainability, which is general accepted and is defined as: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs". In this research, this will further be referred to as sustainability (Bruntland 1987 in Gupta & Abidi 2013, p. 83).

In the year of 2050 the global population is expected to reach close to 9 billion people (Belz & Peattie 2009). Already by the year of 2030 the demand for textile fibres will increase twice\(^1\). Furthermore, more than 1 billion people are lacking access to water (Belz & Peattie 2009). When putting this into relation to textile production, one pair of jeans consumes approximately 10 000 litre of water (WWF 2008), making the ecological footprint of the textile industry is enormous. This means that the humanity have exceeded what the planet can produce (bio capacity), which in turns leads to an ecological overshoot (Jackson 2011; Rockström & Klum 2012).

According to GRI (2006) the sustainability threat is urgent and one of the key challenges is to find innovative and alternative choices for sustainable development. The companies need to balance the economical, social and environmental objectives, both on a short-term and long-term basis. In order to accomplish a sustainable development, adaptations must be made to sustainable business systems (Claudio 2007). WWF (2013) puts it into phrasing by stating that in order to have a decent life for the next generations more sustainable management of natural resources must be made, which is pointed out by the European Union. Therefore, the importance to raise sustainability questions in the apparel industry is now more important than ever.

Consequently, there is a need for developing more sustainable supply chains practices in the apparel industry. The meaning and consequences of sustainability must increase within companies, especially within the textile industry, due to the enormous negative impact

\(^1\) Jonas Larsson, University Lector, Swedish School of Textile, Presentation 27:th November 2013
(Claudio 2007; Salomon & Rabolt 2007; Caniato et. al. 2011; Cervellon & Wernerfelt 2012; Tollina & Vej 2012; Schwarz-Lausten 2012; Gwozdz, Netter, Bjartmarz & Reisc 2013; Hedström 2013). Cetinkaya (2011) is stressing the need for supply chain managers to notice and understand the sustainability issues in companies in order to complete a successful change.

1.2 Framing Circular Economy

Thirty years ago, Walter Stahel started to discuss the need of circular economy thinking and closed loop value chain development. As of today, there is a growing interest in the corporate sphere about the concept of circular economy as a new business opportunity. In March 2014, the first big event concerning circular economy took place in London (UK). The event concerned the challenges of ownership models, sustainable product design and the end of life thinking that comes with the implementation of the circular economy model. Major industry leaders, as well as institutes discussed current and future challenges and shared their respective view about already changing companies and the associated problems (PR Newswire 2013).

McKinsey & Company conducted an analysis where one conclusion was that manufacturing companies within the European Union could save up to $630 billion/year after 2025, if adopting a circular economy perspective (Preston 2012). A more recent research by Nguyen, Stuchtey and Zils (2014) shows that by the year 2025 savings in material cost can be 1 trillion dollars, they point out that this is only possible under right conditions. Only the textile material cost can be reduced with 71 billion dollars according to Ellen MacArthur Foundation (2013). There are financial arguments in favour for this concept seen from a company’s point of view. Preston (2012) argues further that the time has come when the concept fits into the contemporary society and the corporate world.

Circular economy models differ from the linear supply chain model in many aspects. The model aims for being restorative, where systems are optimized in order to be as efficient as possible while not harming the biosphere. The aim is to re-enter products into the value chain in different ways in order to form a circle, where one product can have many different lives Ellen MacArthur Foundation (2013).

The linear model, built upon take-make-dispose is argued to have many limitations in terms of the environmental impact, but also from a value perspective of the product, which is lost in the processing, distribution, use, end of life and design. The actions taken so far; reducing the use of resources and energy is not enough and will only delay the inevitable consequences. A fundamental change for the entire operating system is needed (Ellen MacArthur Foundation 2013). The authors consider the circular economy concept to be a possible solution for future challenges in apparel companies. The definition by the Ellen MacArthur Foundation is joined who define circular economy as:

Circular economy refers to an industrial economy that is restorative by intention; aims to rely on renewable energy; minimises, tracks, and hopefully eliminates the use of toxic chemicals; and eradicates waste through careful design (Ellen MacArthur Foundation 2013, p. 1).
Before entering the discussion of research in more specific, an introduction to supply chain management is needed due to the development and varieties of meaning. According to Cooper, Lambert and Pagh (1997) Supply Chain Management (SCM) is defined as:

The vision of supply chain management embraces all business processes cutting across all organisations within the supply chain, from initial point of supply to the ultimate point of consumption (Lambert & Pagh 1997, p. 5).

One important aspect in this definition is that SCM covers the linear process and ends at the point of consumption. Due to the increasing concerns of environmental issues and social responsibility in the corporate sphere, the concept of SCM has further developed to include sustainability and circular flows. This has led to a definition of Sustainable Supply Chain Management (SSCM), which focuses on the environmental and social impacts, without excluding the focus of the SCM concepts (Gupta, Abid & Bandyopadhayay 2013).

The authors consider SSCM to be the first development towards a circular economy model. However, it does not contain a circular approach, therefore within this research the supply chain management phrase will not be used, due to its linear system thinking. The concept of owning must be rethought, where the producers must find a value in a reverse system. Therefore, the value chain term will be used in this research. Where the authors hope that this will put more focus on a holistic value chain thinking, instead of separate activities.

1.3 The Circular R’s

A useful tool in order to reach a circular economy and close the loop of the value chain is the “three R model” that include; reduce, reuse and recycle (Yang, Zhou & Xu 2014). These three R’s is the base in the Revised Waste Framework Directive. Esty and Winston (2006) expanded the basic model with two more R’s, re-imagine and re-design. Other researchers have added R’s such as recover, remanufacture and re-design in order to increase the model and close the loop of the value chain (Badurdeen, Iyengar, Goldsby, Metta, Gupta & Jawahir 2010). Quariguasi Frota Neto, Walther, Bloemhof, van Nunen and Spengler (2010) mention reuse, recycle and remanufacturing, as well as repair and refurbishing. Nguyen, Stuchtey and Zils (2014) also add redistribute to the model. In a study made by Guide, Daniel and van Wassenhove (2009) remarketing is also mentioned as a way of closing the value chain loop. Pui-Yan Ho and Choi (2012) present the possible need to add R’s such as re-wear, restyle, and reward. Last, reverse is focusing on the logistical processes (Wright, Richey, Tokman & Plamer 2011).

The following R’s have been chosen to be investigated: reduce, reuse, recycle, re-imagine and re-design. The first three R’s are chosen due to the significance and the recognition of the R’s in the apparel industry and in the scientific community. Re-design and re-imagine are chosen due to the identification of various words with the same meaning and the fact that the authors consider the circular economy approach lacks a sense of creativity. The authors consider re-imagine and re-design to cover many aspects and most important, these two R’s will bring valuable knowledge into the apparel industry. Reverse, is also discussed in the model due to the need for a reverse logistics systems in order to bring the garments back into the system.
All R’s are summarised and divided according to below table:

<table>
<thead>
<tr>
<th>Re-imagine</th>
<th>Reduce</th>
<th>Reuse</th>
<th>Re-design</th>
<th>Recycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Re-think</td>
<td>Recover (energy)</td>
<td>Re-wear</td>
<td>Restyle</td>
<td>Re-manufacture</td>
</tr>
<tr>
<td>Remarketing</td>
<td>Repair</td>
<td>Repair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reward</td>
<td>Rental</td>
<td></td>
<td>Re-manufacture</td>
<td></td>
</tr>
<tr>
<td>Reverse</td>
<td>Redistribute</td>
<td></td>
<td></td>
<td>Re-furbishing</td>
</tr>
</tbody>
</table>

Table 1. Summary and division by the circular R’s

1.4 Point of Departure and Research Gap

The main inspiration and point of departure is based on the research article “A Five-R analysis for sustainable fashion supply chain management in Hong Kong: a case analysis” by Pui-Yan Ho and Choi in 2012, since this five-R analysis can display what is lacking within a company and where further improvement can be developed. The research concerns a case study of an apparel company in China, where the aim is to develop and generate insights for the apparel industry, concerning why sustainable development is important. The study has an indirect discussion about the concept of circular economy. Suggestions about future research were made, where the researchers stress the need to investigate more challenges and benefits of implementing a closed loop value chain; where the focus is put on reduce, reuse, recycle, re-imagine and re-design. However, the study is missing the framework perspective and a direct approach regarding circular economy practices. They also discuss the need for more R’s in the model. The authors have identified a clear research gap.

Different models of circular economy have been investigated that contain these R’s. Three models have caught the authors’ attention, which are not theoretical in that sense. They are generally accepted in the business society and are therefore central for this research.

The first model of circular economy is by the Ellen MacArthur Foundation (2013) (Please see appendix A - model 1) and is divided into different circles representing various ways to restore material. This model separated the biological and technical nutrients. When focusing on the technical materials, the circular economy model can be divided into four areas of consideration: maintenance, reuse/redistribute, refurbish/remanufacture and recycle (Ibid). Waste reduction is the main deficiency in model 1, the authors would furthermore appreciate a higher degree of creativity inform of re-design and re-imagine, in order to adopt model 1 entirely.

The second model is developed by RSA (2013) (please see appendix A - model 2) as a part of the Great Recovery project. This model has two main circles where the inner loop (with four sub-loop) focus on the design aspect, where design has to be brought into longevity, service,
reuse and recovery. The outer loop describes the product flow in the society (Ibid). Due to the similar concept as the above model, the authors also lack the reduce concept. This model has focus on the re-design aspect that the authors would like to integrate into this research model.

The last model is framing the basis of the EU Directive 2008/98/EG EUT L 312, 22.11.2008 pp. 3-30 (please see appendix A - model 3), which focus on depositing, energy recovery, recycle, reuse and minimization. This builds upon a hierarchy where the top is the start, with the aim to not create waste at all. Due to its significance in waste management theory, this model caught our attention. However, this model in turn lacks many other aspects that are of the essence in order to close the value chain loop and creating a circular economy framework.

Due to the mentioned limitations, in terms of different wording and meaning, making them confusing and limiting both from a theoretical and an empirical point of view. When adding the apparel industry context, a clear research gap has been identified due to the lack of case studies performed in the areas of the circular economy concept. Consequently, a summarized model is needed, covering the essence of the above three models, but put in the most generic phrasings in order to develop a framework that can be used the apparel industry.

1.4.1 Purpose and Research Questions

The purpose of this research is to explore current practices regarding circular economies in the apparel industry and to construct a framework for integrating circular economy practices in the Swedish apparel industry.

The research is executed through the following research questions:

- How can a Swedish apparel company develop their value chain towards a circular economy?
  - What are the main barriers for implementing a circular value chain?
1.4.2 The Framework Model

In order to answer the research questions, an initial model is developed out of the three economy models explained above, by using the five R’s analysis wording. This resulted is a summarized model that is specific for the apparel industry. The model works as a basis for the theoretical, empirical and analysis framework, which is illustrated in figure 1.

- **Re-imagine** and **reduce** are activities embedded into the corporate strategy, culture and overall processes, therefore these are connected to all the points in the circular chain. Reduce focuses on reduction of waste that should be totally eliminated in a circular economy. Re-imagine focuses on practice the activities differently, which is in line with sustainability.

- **First user loop (1):** the aim it to maintaining the garment in the first user phase as long as possible.

- **The reuse loop (2):** The inner post-consumption loop of the reverse strategies is reuse, which could be accomplished through: renting, second hand and repair.

![Figure 1: Model, integrating circular economy practices](image-url)
● *The re-design loop (3)*: This is where the clothes go back to the garment producer, in order to be made into something else.

● *The recycle loop (4)*: The outer circle of the reverse strategies is recycling, where the garments are broken down into fibres and put back into the loop at the textile mills. Donating the garment to a third party could be one step before of the recycling process, where a person uses the garment in its original form before it is to be recycled.

● *Production recycle loop (5)*: The stage within production where waste is recycled, i.e. pre-consumer waste.

### 1.5 Contributions

By answering the research questions and fulfilling the purpose of the research, the study will lead to both a theoretical and an empirical contribution. The theoretical contribution to the scientific community is building of a framework for the circular economy practices within the apparel industry. In order to develop and explain the concept the authors bring new knowledge into the scientific field about circular economy. The industrial contribution is where this study provides more knowledge about the practical implications of circular economy practices, which will bring more companies to rethink their value chain operations and become more sustainable.

### 1.6 Delimitations

The thesis is limited to the Swedish apparel market and to companies that have started to implement a circular economy approach. No division is made between male and female apparel. Due to the broad concept of circular economy, not all aspect will be covered, where the biosphere material will not be issued in particular as well as the detailed technical aspects due to the management perspective. The focus is put on the production of the garment and the value chain forward after this point.
2. Methodology

In below chapter the methodology will be presented, argued for, as well as criticized, starting off with the scientific approach and the research strategy. This leads into the collection, processing and analysis of the data.

2.1 Scientific Approach

Due to the nature of the research questions and the phenomenon investigated, it is of value to consider epistemological issues, which refers to what is to be accepted as knowledge. Interpretivism has the view that science is subjectively constructed, meaning that reality is built within the subjective mind of the social entities (Bryman 2012) and is therefore in line with this research. This study explored and interpreted an environment containing social actors, which means that the case units acted within a social context and the author’s interpretation of that context will be visible in the research. Interpretivism is positive to a transparent study where the authors are involved (Ibid).

Ontology concerns the social entities in the world and whether or not these are objective entities in the reality or whether they are constructed within the social context and by their actions. Within this field, two main positions are being pointed out; objectivism versus constructivism (Bryman 2012). This research accepts the fundamentals within the constructionist view. This means that meanings are formed by the social actors and can therefore change over time and space, since the social actors interact, manage problems or challenges (Ibid).

The Authors: Due to the involvement within the research Linda Petersson and Sara Fahlén will in the running text be referred to as the authors.

2.2 Research Strategy

The research strategy concerns the distinction between qualitative and quantitative research, the qualitative was used in this research. Qualitative research is used in order to find meanings and explanations of a phenomenon. (Bryman 2012) Due to the nature of the research there was a need for flexibility, the research was planned and formed during the research process itself. Another argument for choosing a qualitative research strategy was that depth rather than width was the aim. The study aimed to understand the case units and the relationships that are formed between industry dynamics and the circular economy goals, which also are in line with a qualitative study (Ibid).

When performing this research the aim was to provide accurate knowledge that is used in order to explain the reality. In a qualitative research study theory is usually the result instead of being
the start of the research, resulting in verifying a problem. Within abductive reasoning, prior theoretical knowledge is shaping the problem, which is tested by empirical observations. These are later on matched with theories that generate a deeper understanding of the knowledge, which is illustrated in figure 2. Abductive reasoning is also in line with logistics research (Kovács & Spens 2005).

![Abductive Research Process Diagram](image)

**Figure 2: Abductive research process, adapted from Kovács & Spens (2005, p.139)**

### 2.3 Research Design and Objective

The study was an intensive analysis of two companies in the apparel industry, which is referred to as a *case study design* (Bryman 2012). Yin (1994, p. 13) define a case study as:

> Investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (Yin 1994, p. 13).

The case study approach is suitable when the need of in-depth information is high and when the aim is to understand problems, processes or challenges within the investigated unity, which is closely connected to the research purpose (Bryman 2012). Due to the fields relatively new time aspect, an exploratory purpose was held at start, where the aim was to understand the field of circular economies in the apparel industry within the Swedish market. Due to the purpose being descriptive in nature, a descriptive purpose was also held, which aimed to understand the concepts of the case company when putting that into the context of circular economies.

### 2.4 Collection of Data

The collection of data was performed during ten weeks in the spring of 2014. The authors started off from theory in order to get educated within the subject as well as illustrate the field, phenomenon and context. Due to the abductive approach where the aim was to gain
understandings in the subject, plus the fact that not a lot of research has been made in this field, a narrative approach was used in the literature review. A narrative approach is according to Bryman (2012) a way to get familiar with the field, being less focused depending on the research outcomes, which is in line with the interpretative epistemological considerations of this research.

Secondary data sources were studied from different areas and disciplines. The authors have always critically reviewed the sources, in order to ensure good quality. The publications were well used in the research field, the articles peer reviewed and preferably quoted. Examples of databases used were “ Summon”, “Science Direct”, “Emerald” and “Google Scholar”.

The companies were selected early in the process in order to guide the study, out of a purposive sample approach. This means that the cases were chosen out of the research questions and are based upon the level of relevance to these, in order to fill the research gap. There are certain criteria that should be considered such as the context and the participants (Bryman 2012). The selected companies are acting within the Swedish apparel industry and are already having a sustainable approach and want to develop their circular economy practices. The first company (Uniforms for the Dedicated) was explored in detail and analysed in order to build conclusions and generate new theories, therefore the six interviews conducted.

This was later on tested on a second case company (Filippa K), where the model was discussed in detail, in order to form a solid study; hence the need for interviews decreased. To become more generalized, the model was changed. During this process the theoretical framework was also built, theory was added and excluded from the research as the empirical results progressed, all according to abductive reasoning.

During the literature review and the data collection process, the development of the framework model presented in chapter 1 started. In accordance to the abductive research approach, the model was developed through the research process and changed after the analysis, when the holistic view of theory and empery was put together. This research approach was developing where the authors gained knowledge along the process. This resulted in a more realistic and general accepted model along the journey.

2.4.1 In-depth Interviews

In-depth interview work as a suitable instrument in order to discover attitudes, motives and thoughts (McCracken 1988; Seymour 1992), therefore this type of interviews were chosen in order to gain deeper knowledge about the units studied (McCracken 1988). The participants in the interview sessions were aware of the purpose and aim with the study, which mean that a direct approach was used. Due to the aim of getting a deep understanding and a holistic picture of the case, interviews were conducted with various persons and roles in the companies, please see table 2.
The sample was based on the relevance to the research as well as their knowledge about the research field, according to the research design (Bryman 2012). When formulating the questions, the authors discussed the imagined answers and the questions were formulated in order to answer the research questions and fulfil the purpose. Partly, the Higg Index framework was used in order to use a language that is accepted in the industry and in order to make the generalization trustworthy. The Higg Index is a self-assessment tool developed as a help to understand and evaluate the chosen materials effect on the environment. The tool is based on a life-cycle perspective, where the product developer answers practice-based questions to estimate and evaluate environmental performance. The Higg Index 2.0 also work as a learning tool, the company can monitor the improvements and opportunities (Apparel Coalition 2013).

The interviews were performed according to a semi-structured order, meaning that a list of specific topic served as a frame of reference in the interview guide (please see appendix B, C and D) (Bryman 2012; Seymour 1992). The interview guide had a logical order with the aim to establish an informal atmosphere in order for the interviewee to talk as freely as possible around the subject. This was a successful way of working and in line with ontological and epistemological considerations explained above. The authors want to stress that the interview guide only worked as a framework, meaning that the interviews had different focus depending on the role of the respondent.

The questions were asked as open as possible in order not to lead the interviewee and to accomplish probing, meaning that the questions were reformulated when the person was not answering the intended question (Bryman 2012). Some direct questions were asked, when simple and direct answers were needed. The authors were well aware of the risk of subjective judgments when the authors interpreted the interview. Within the discipline of interpretivism and constrictions, subjectivity has been acknowledged. In order not to make our personal opinions and being subjective to the selected companies, the authors have been discussing the answers in depth. Due to the authors’ different background and education, a sense of objectivity has been reached.
The interviews were performed in person and the meetings always started off by introducing us, the thesis and asking if confidentiality was needed and if the respondent wanted to be anonymous, which is according to Thompson, Locander and Pollio (1989), important when interviewing a person. Second, the interviews started by asking general questions, where the company got the chance to explain who they are and why they do what they do. This then lead into more specific questions that the interviewee could answer in detail. During the interview, one of the authors asked the question and developed the dialogue with the interviewee, while the other person observed and took keynotes, as well as made sure that all questions were asked. In order to make the interview object comfortable, the interviews were held at their office/design studio, which according to Bryman (2012) may raise the quality of the research.

Further more, public company reports worked as a complementary collection of data for Filippa K, where their social and sustainability reports were used in order to gain valuable fact. By using reports by the company, the authors got educated and could focus on vague areas that needed more explanations during the interviews.

### 2.5 Processing and Analysis of Data

When the interviews were performed, the data were recorded in order for the conversation to be as informal as possible. Shortly after the interview, the recorded material were listened to and discussed, in order to be able to identify themes and sub-themes that had a clear connection to the research focus. The themes that were identified were those who were repeated from the different interview objects, similarities and differences, as well as praxis within the case companies. This approach gave good knowledge about the material, which contributed to a starting-point was found for the analysis. Both of the authors were well-grounded within the interview material and on-going discussions were made in order to find the best arguments and themes for the analysis.

The empirical data were matched with theory in order to build the basis for the analysis. During the process the theoretical framework developed in accordance to its relevance to the empirical data, where theories were both added and deleted. The matching resulted into five main constituents shaping the structure of the thesis content: re-imagine, reduce, reuse, re-design and recycle. The notion of undeveloped research areas became clear, which also meant the need to add another interview object (Studio Re:Design). By using the same structure throughout the thesis, the findings in the process became clear. This led to a modified model for a circular economy (please see Figure 1, page 13). Last, the applied structure of the analysis also supported fulfilling the purpose and answering the research questions.

### 2.6 Methodology Discussion

In order to evaluate the method some criteria must be used. Due to the abductive approach and qualitative research strategy, the authors consider validity and reliability not to be the most preferable way to establish the research quality. Mason in Bryman (2012) argues that these evaluations methods are not in line with a qualitative approach in certain disciplines. The
authors therefore decided to join Lincoln and Guba (1985) in their criteria of assessing the quality of research, which are argued to be in line with the qualitative research. These are trustworthiness and authenticity.

2.6.1 Trustworthiness

According to Lincoln and Guba (1985) the trustworthiness depends on four criteria; credibility, transferability, dependability and conformability.

Credibility refers to the causal relationship or the probability of the research study being completed according to praxis in the social research discipline (Lincoln & Guba 1985). Due to the large amount of data studied, in combination with the chosen research current research praxis in the field was used. This means having a qualitative research strategy and joining the interpretivist and constructionists philosophical standpoints, which are the most common approaches used in the discipline.

Transferability refers to if the research studies could be transferred into other contexts. Within case studies that have a qualitative research strategy, the study is depended on the social context it is studied within; therefore the transferability is often critiqued (Lincoln & Guba 1985). The authors consider the transferability of this research to be fairly low, due to the specific industry of apparel, which is the focus of the research purpose. Due to the triangulation approach used the study may be transferred to other apparel companies in the Swedish context. By using two companies, where one was used for testing theories and the model, concluded in changes that were needed for more transferability. The transferability is however limited to the apparel industry.

Dependability explains the way the research is performed, in order to reach high dependability all track records; sources, references, data and transcriptions should be saved in order to establish a good quality of the research. Also explaining in detail how the research is performed during the different phases makes the dependability higher (Lincoln & Guba 1985). The dependability of the research is high due to the thorough description of the research process and reference systems. All data were saved and archived, both research articles as well as the original recordings of the interviews, which may be claimed when asking the authors. The various interview guides are attached as appendix (please see appendix B, C and D), which in total contributed to high dependability.

Lincoln and Guba (1985) stress the importance of not letting the personal values interfere with the research study or result, which is referred to as conformability. This means that the research should act according to good faith. The epistemological and ontological considerations adapted in this research do state that the subjective interpretations of the social world are acceptable. In order for these to not take over the research, the authors are aware of the importance of conformability. Other students have continuously reviewed the thesis during three seminars where the study was discussed and critically reviewed. A close relationship to the supervisor has also been established and the research has been reviewed and discussed with the supervisor at eight meetings during the ten-week period. Last, an external person having a PhD have
critically read and reviewed the research and discussed improvement areas. In total, having a critical approach towards the companies have also lead to conformability.

2.6.2 Authenticity

The authenticity of the research depends upon how authentic the research is and to what place the research takes in the bigger picture (Lincoln & Guba 1985).

First of all, it is important that the objects in the study are represented in a fair way, meaning that data should not be manipulated (Lincoln & Guba 1985). The authors have acted accordingly and saved all the original recordings in order to keep the research study transparent. The case units are thus represented according to the interpretivist epistemological view, since the authors interpreted the data and the observed situations. The authors have also worked closely together and discussed different interpretations and understandings of the research. Due to different background and views of the world, authenticity is increased.

Second, the research should also aim at helping the participants in the research to better understand their social setting, which is referred to as ontological authenticity (Lincoln & Guba 1985). The research aim at contribute with both theoretical knowledge to the scientific community as well as practical knowledge for the case units, in order for them to develop a better understanding of their role in relation to the bigger picture. Having two companies will make the ontological authenticity higher since comparisons were made. This also increased the educative consideration, which helped the social entities to understand other contexts better. Furthermore, the research study fulfils the educational perspective within the unity that consequently raises the authenticity of the research.

Catalytic authenticity and tactical authenticity concerns the way the research acts in order to change circumstances in the research or if the research takes steps in order to make the members more engaged (Lincoln & Guba 1985). Since the interviews always were conducted within the natural setting, the atmosphere was relaxed, transparent and informal. The engagement level was always high, therefore no needed actions was made in order to increase the engagement level of the interviewees. In total the research process was intense yet thorough and the authors consider the research purpose to be fulfilled.

2.7 Methodology Summary

In order to fulfil the purpose of exploring current practices regarding circular economies in the apparel industry and to construct a framework for integrating circular economy practice in the value chain, the authors had both an exploratory and the descriptive goal. A qualitative research strategy with abductive reasoning was used, where nine semi-structured in-depth interviews was performed and analysed.
3. The Five Circular R in Theory

In below chapter the theoretical framework is presented which is divided in five parts, with a foundation in the model presented in the introduction chapter: re-imagine, reduce, reuse, re-design and recycle. Starting off with re-imagine.

3.1 Re-imagine

Re-imagine is according to Esty and Winston (2006) needed in order to build a successful, yet sustainable business. According to their research, thinking differently and re-imagine processes and products have shown to be more profitable than the original three R’s (reduce, reuse, recycle). Fletcher (2008) describes today's situation indicating as; using yesterdays thinking, in order to cope with the future conditions. The aim of re-imagine is to think more creatively and create new mind-sets, in terms of environmental issues in order to see new opportunities and possible ways to restore the products into the value chain loop (Pui-Yan Ho & Choi 2012), resulting in new business models (Niinimäki & Hassi 2011). It is important to have a holistic view of the business, which includes all the specific products life cycle (Etsy & Winston 2006).

According to Niinimäki and Hassi (2011) and Pui-Yan Ho and Choi (2012) sustainable innovations have not become a success due to the lack of acceptance from the customer, indicating that the demand side and customer relationships must be included in the innovation process. Therefore, re-imagine is connected to the various parts of the value chain, and plays a vital role for the whole circular economy system to function.

The authors want to stress that in the research made by Etsy and Winston (2006) and Pui-Yan Ho and Choi (2012), re-imagine can both be re-imagination of what the company offer, i.e. the products and how they do it, i.e. the processes. The concepts of re-imagine and re-design are presented and describe similarly, making it hard to differentiate. Therefore, the authors want to clarify that when referring to re-imagine, the processes is the aim, and re-design is connected to the actual garments when it is consumed in the reverse process, which will discussed further under the chapter re-design.

3.1.1 Re-imagine the Value Chain

One important area to bring up, when discussing circular economy is re-imagine how the products flow through the value chain and back, such as reuse, re-design and recycle. This is was the author's connect to reverse, i.e. without the reverse function a circular economy cannot be built, which is often a neglected. This is challenging due to the many stakeholders involved in decision-making, such as customers and the government (Wright et al. 2011). On the other hand, Etsy and Winston (2006) stress the fact that some of the environmental issues are impossible for a single company to solve by themselves, it is therefore essential is to find companies or organisations that together can achieve common goals.
When consider implementing a reverse chain, the value gained by the reversed materials must be higher than the costs of it, otherwise the industry will not have the incentives needed to change and progress as fast as needed. This is one of the biggest challenges with creating a circular economy framework. If the reverse system have little value, interventions by the government would be necessary. Moreover, when the customers and downstream partners become suppliers (as in reverse logistics), the incentive of providing the product into the system is vital, in order not to dispose the garment in the most convenient way. Suggestions of incentives are: tax on non-recyclable waste and products and environmental credits (Wright et al. 2011).

Collaboration is vital for other reasons as well. Pui-Yan Ho and Choi (2012) suggest that collaborating with local suppliers, may lead to reduced waste and energy, related to logistics. This may also generate positive effects such as just-in-time production and delivery, due to the shorter lead times. The researchers further describe the importance of re-imagine how and who the company is collaborating with along the entire value chain. Therefore, re-imagine is connected to the entire circle and strategies within a company.

### 3.1.2 Re-imagine the Design Concepts

Re-imagine also includes the products or services offered by the company as well as the design processes. Two concepts of design worth mentioning are eco-design and design for the environment, which is applying environmental criteria in the design of products. The focus of eco-design is to improve the process of product development rather than the actual product design, that include design for recyclability, which must be included in the design process. Further more, products can be developed to be more environmentally friendly through the use of fair-trade or organic fabric (van Weenen 1995). This is vital to discuss and to act upon, since Powell and Prostko-Bell (2010) conclude that it is better and less expensive to create a low impact product, than try to retrofit a high impact product.

Another design concept is design for longevity, meaning developing products with a longer lifetime, where the aim is to minimize the use of resources. In order to increase the lifetime, van Weenen (1995) suggests using modular design, which means that components of the product can be exchange, instead of the entire product. By creating more durable product, cost efficiency is achieved. In order for reuse to be efficient and meaningful, longevity needs to be considered in the beginning of the design process (van Weenen 1995). Slow design or slow fashion is a similar concept, the aim is to extend the lifetime and to increase the customer satisfaction through high quality, high ethical values, timeless design and the fact the product is consisting of sustainable materials (Fletcher 2008).

According to Niinimäki and Hassi (2011) the main problem with today’s industrial system in the textile industry is the short life cycle of the products. In their research they suggest different design thinking in order to solve the problem. Emotionally satisfying design and getting emotional attachment to a product, by value creation, may lead to an extended use of the garment. Customization and co-creation are two ways of creating value, when the customer is involved in the creative process, which causes a higher emotional attachment to the garment. These two design concepts require new business models and manufacturing systems, but new
digital technologies makes it easier to satisfy each customer’s desires and needs. However, it is not certain that the environmental impact will decrease if implementing the described strategies, unless the total amount of production decreases (Ibid).

3.1.3 Re-imagine Choices

A problem in the design process is the trade-off situations that may occur between different environmental targets that are making the decision making more complex. Examples of trade-off conflicts can be the choice between two materials that have different properties and environmental impact, where mixing materials contribute to higher quality and thus longer life time, but have major consequences in the recycle processes (which will be explained in more detail under the chapter recycle). The trade-off may further occur between material and energy or material and cost. The conflict can be choosing between a material with lower quality for a better price or a better quality material for a higher price. The material choice is crucial, but can be difficult when environmental aspect is taken into account and the choice must be analysed through a lifecycle perspective. All the potential trade-off situations and the alternative consequences need to be considered in an early stage of the design process, since it becomes more costly to change decisions further on (Byggeth & Hochschorner 2006).

Depending on the corporate values the outcome of a decision may differ, since some value their customers, the environment or corporation. Byggeth and Hochschorner (2006) stresses that it is likely that company primarily base their decisions on economic reasons. Creating a big risk that environmental aspect will not be a top priority in certain trade-off decisions. In the long run it is possible to reduce this gap. If environmental aspects are integrated in the process of product development, this can lead to other positive interests and if synergy effects are identified early in the process, the function of the product can also be improved. This makes it possible to for a win-win-win-situation, where the customers, the company and the environment benefit (Ibid).

3.1.4 Embrace Support Tools

In trade-off situations, where environmental aspects are included, support tools are often needed in order to make decision on fundamental fact. Byggeth and Hochschorner (2006) present several possible tool that can be helpful, all of them include the life cycle thinking, where five of them are presented in this research due to the connection to the textile industry. In general, all support tools mentioned below are based on a grading system, which guides in trade-off situations:

- The Environmentally Responsible Product Assessment Matrix
- LiDS-Wheel
- The ABC-Analysis
- The EcoDesign checklist
- The Strategy List
These tools are considered to be useful and can also be used together due to their complementary functions. Basic environmental knowledge is needed, both for input entering as well as for output analysing (Ibid). Outside of the current theory, an assessment tool under development by the Sustainable Apparel Coalition is the Higg Index, as explained in more detail under chapter 2. Yet another tool is the RPI, explained further down in this chapter.

3.1.5 Re-imagine your Time Perspective

Reaching sustainability goals demand a long-term perspective (Werbach 2009). Embracing new mind-sets will not happen over a night and all these changes require time and effort, both from the company as well as other parties involved (Changing perspectives 2014). The case study by Pui-Yan Ho and Choi (2012) conclude that all changes take times. The authors therefore assume that reaching a circular economy is a process that cannot be rushed. Embracing small step at the time will consequently lead to an accumulated big change in the end.

3.2 Reduce

According to Seadon (2010) waste is the outcome of inadequate thinking and can only be identified and reduced when put in relation to a process system. Pui-Yan Ho and Choi (2012) consider primarily this to be connected with sourcing and production activities within a company. In our model, reduce is a mentality that should be implemented into the entire circular economy system. Reduce is identified as the reduction and prevention of pre-consumer and post-consumer waste. Shedroff and Lovins (2009) bring this discussion one step further when suggesting that in order to become eco-efficient within the value chain, the concept of waste should be eliminated, not reduced.

3.2.1 Reduce by Avoiding Pitfalls

Some of the main general pitfalls in dealing with waste are according to Seadon (2010) that people spend time analysing the households’ waste. Since the waste management/recycling infrastructure is underdeveloped no progress is happening, therefore the industry should instead focus on developing reverse logistics systems, something that is lacking in the apparel industry. Furthermore, companies tend to have a short-term perspective when developing solutions for reduction of material that must be upgraded to long-term sustainability thinking (Werbach 2009). Seadon (2010) expresses this as the individual focus, where companies instead should have holistic system thinking and more patient when analysing the response of the new solutions, as well as the potential side effects. If rushing the evaluation of a solution, this could lead to further investments, which might not be needed and in the end might needs to be corrected. All these pitfalls of waste management are identified as common in complex systems, such as the apparel system (D’Amico, Giustiniano, Nenni & Pirolo 2013).
3.2.2 Reduce by Supplier Collaborations

According to Cardigan (2013) the souring activity is one of the most important activities in creating a successful piece. However, putting this in relation to the opinions of Braungart, McDonough and Bollinger (2007), the globalization has caused a problem regarding a sustainable sourcing approach. Pui-Yan Ho and Choi (2012) suggest aiming for local sourcing, in order to minimize transportation time and cost and to reduce stock of fabric or goods. Adding another dimension to this, close collaboration with suppliers in order to find the best and most sustainable raw material is suggested by Sloan (2010), which could lead to decreased waste. Caniato et al. (2011) describe that even going as far as disintermediation of intermediaries is needed in order to develop towards sustainability. The authors consider local sourcing and close collaboration with suppliers being of the essence for the circular economy framework, due to the high need of collaboration between design and production needed in order to build a reverse system for recycle and reuse. It is therefore important that reduce must be connected to all parts of the circular economy chain.

3.2.3 Reduce the Seven Wastes of Muda

In the manufacturing philosophy called lean production, with the aim to reduce waste, not only in terms of material but also in terms of inefficiency in processes. The foundation of the philosophy is the identification, mapping and reduction of the seven wastes of muda. This could be connected to textile management and is as relevant for the circular economy model as for conventional supply chain strategies (Harrison & Hoek 2011). The authors have identified these wastes as being non-value adding processes within the value chain. According to Harrison and Hoek (2011) the seven wastes of muda are the following; overproduction, waiting time, transporting, inappropriate processing, and unnecessary inventory, unnecessary motions, and defects. Unused employee creativity is an eight identified waste. The aim is to reduce these wastes in order to become more efficient. Dües, Hua Tan and Lim (2013) argue that these seven sins of waste are closely connected towards the movement of sustainability.

Seadon (2010) identified the elements of a waste management system being the need for negative feedback loops, which lead to self-regulation and controlling of one's behaviour. Moreover, the system should not be connected to growth meaning, “the more waste - the better”, it must be the other way around where the less waste the better result. Multiple uses of products, resources and processes and implementation of diversion processes for the wasted material must be adapted in the company. Pui-Yan Ho and Choi (2012) suggest an action that is connected to production, where sophisticated lay technologies could help to fit patterns on the fabric in order to reduce material waste in the cutting phase.

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2 Larsson, Jonas. University Lector, Swedish School of Textile, October 2013.
3.2.4 Reduce in the User Phase

Concerning the user phase, washing and disposing the garment have been identified as the most harming lifecycle phases on the environment (Laitala & Boks 2012). Washing the garment is closely connected with garments care labels and tags, which work as the communication point between the manufacturer and the user. However, studies show that little knowledge is gained from the attached care labels. There is a need for innovation in the communication effect of care labels attached (van der Merwe, Bosman, Ellis, van der Colff & Warnock 2014). Furthermore, reduction actions must also be embraced at the point of purchase. Niinimäki and Hassi (2011) state that at point of purchase the consumers have trouble evaluating the quality. Therefore a suggestion is to inform the customer about the lifetime of the garment and how many washes it can manage. Being transparent in this manner will give the knowledge needed for the customer in order to make better decisions, where the long perspective is given.

What is vital to connect to purchase is that Carrigan and Attala (2001) states that the consumers do not want to suffer personally when purchasing a sustainable product, meaning that the value gained should not be lower than the costs of buying and using it. Other study shows that there is a lack of connection between intended sustainable actions and the actually performed actions. Studies have also shown that consumers dispose garments due to selfish reasons instead of social responsible reasons, i.e. consumers want more space in the wardrobe or are bored of the clothes and want to update their style due to a new trend (Carrigan & Attala 2001). Therefore, Lee, Halter, Johnson and Ju (2013) suggest that there is a need to educate, inform and promote sustainable consumption, maintenance and disposal of clothes. They also address an important issue where the retailers should engage in partnerships in clothing disposal, in order to remove the responsibility from the consumer to the retailer. This could also lead to relationships and loyalty actions for the consumer. In our model, reverse logistics is closely connected to this problem.

3.3 Reuse

According to Pui-Yan Ho and Choi (2012) reuse refers to use item in its original format. The authors consider rental, second hand and repair to fall under this category. Not only does this refer to the piece, but also to use the pins or packaging, however the focus in this section is put on the garments. Laitala and Boks (2012), who investigated the disposal habits of the consumer, suggest that one core possibility for sustainable development is to prolong the time a garment is used, which could reduce environmental effect both in absolute and relative terms. According to Lee et al. (2013) about 95 percent of garments is recyclable and reusable in some sense, therefore the first user loop of our model, where the aim is to keep the piece of clothing in this loop as long as possible, i.e. increase the maintenance is of great importance.

Research show that our contemporary society is moving towards a so-called sharing economy or collaborative consumption; this means a consumption system where the consumers reuse goods. The Collaborative consumption is one way in the move towards a sustainable society (Heinrichs 2013). Putting this into the context of apparel; In the Swedish market, 22 kg of textile is discarded on average each year and only 17.5 percent of these are recycled (Mistra
2010). This means that there is a potential for using these clothes again, instead of being thrown away. Within the concept of collaborative consumption, it is usually the consumers who find each other, however new business models are developing also from the supply side (Heinrich 2013).

3.3.1 Reuse as Second Hand and Rental

Lindgren, Lüthi and Fürth (2005) identified an increase in demand for second hand and vintage clothing. A lot of the research found in the literature review covers the global trade with second hand clothing from the western market to developing countries. Few studies have been made about brands, reselling the clothes again. One example of this is Acne Archive or Filippa K Second Hand in Stockholm, who resells the clothes and does business under the brand name. A study by Farrant, Olsen and Wangel (2010) show that reusing clothes through second hand have a significant contribution reducing the environmental impact.

Another side of reusing clothing is rental. Renting is defined as when a transaction is made only for a specific period, with no change of ownership (May, Shim and Kotsiopulos 1992). Renting products can be identified as environmentally friendly since this can decrease the accumulated amount of products over time and it consequently a meaningful for this research study (Moeller & Wittkowski 2010). According to Beck-Friis (2013) the phenomenon of renting clothes has been developed during the financial crisis in Europe and USA. The demand for renting goods such as clothes has increased according to Moeller and Wittkowski (2010). This change is due to the change of behaviour in experiencing a product, instead of enjoying the pleasure of ownership. Therefore, service has been identified as a way of satisfying the need of the consumers, with less environmental impact compared to traditional business models. The concept is built on buying a service instead of products, where the actual ownership of the product does not fulfil the needs. The service can be leasing, renting as well as networks for sharing or exchanging garments. In this system all material goes back to the company after the use phase that can close the value chain loop. The need for development of a commercial renting system is vital (Niinimäki & Hassi 2011).

3.3.2 Reuse as Repair

Laitala and Boks (2012) have identified that a common reason for why a garment is disposed, is connected to looks, where if the garment is degraded in terms of pilling, colour fastness, washing and seams, it is disposed of. The retail manufacturers could postpone all these reasons if they secure the quality of the collections and the manufacturing processes, a thought also shared with Niinimäki and Hassi (2011). If a garment is broken, one could repair it. One of the biggest obstacles is the lack of knowledge and time for the consumer to repair their clothes (Laitala & Boks 2012: Goworek, Fisher, Cooper, Woodward & Hiller 2012). Therefore, providing this knowledge to the customers as well as repair kits, could lead to more consumer repairing their clothes. Repairing clothes is viewed as cost efficient for the companies and this is an opportunity both in terms of researching a circular economy as well as gaining revenue, where the apparel companies can offer an add-on activity at the retail store (Goworek et al. 2012).
3.3.3 Reuse as Donation

Companies are annually donating millions of dollars to non-profit organizations to support projects and initiatives. The donations are not only monetary, but also items of the corporation and the time of the employees and is often linked to the company's CSR strategy (Lichtenstein, Drumwright & Braig 2004). Farrant, Olsen and Wangel (2010) address donation as a way to reuse clothes and in that way lower the environmental impact, donating is therefore a circular practice.

According to Farrant, Olsen and Wangel (2010) there are several organizations collecting and reselling clothes in second hand stores. The clothes that cannot be reused are often recycled. If recycling is impossible, the garments end up in the landfill. The donation system has two main purposes. Firstly, offer cheaper clothes in developing countries. Secondly, to raise funds for financing development projects. Farrant, Olsen and Wangel (2010) are emphasizing that the environmental benefits connected with donation and second hand sales, may only happen if these garments replaces a purchase of a new garment.

3.4 Re-design

Re-design is according to the Oxford Dictionaries (2014) "Design (something) again or in a different way". Neither Esty and Winston (2006), nor Pui-Yan Ho and Choi (2012) include re-design in their reverse strategies, in terms of the product. The authors have identified that re-design must reach upcycling and differ from the conventional design process.

3.4.1 Upcycling

Niinimäki (2011) suggest that extending the life of a garment can be accomplished through upgrading, repairing or modifying, which will lead to a higher emotional value for the consumer. This is closely connected to the term upcycling, meaning that the product gain value by reusing them, instead of decrease in value (downcycling), in terms of material, aesthetic, economic or emotional value. Therefore it is valuable for companies to re-design products rather than recycle because the value increased instead of decreases (Earley 2011). One pitfall is the need of skills in manufacturing processes and upcycling techniques. Also resistances towards working with second hand and waste garments as raw material have been identified (Gould 2014).

3.4.2 The Re-design Process

Shedroff (2009) suggests in order to making it easier to re-design garments (after the user phase), the initial design could be based on a modular system, making it easier to replace specific parts of the garment. Earley, Goldsworthy and Vuletich (2010) also stress that the initial design of the garment must also include the next design life cycle loop.
The textile design process can differ from company to company. Usually the steps of the process follow a similar structure (Studd 2002). Theories about re-design processes are lacking but an assumption is that it looks similar to the usual design process. Studd (2002) present a generic design process which starts with planning, followed by a creative process of idea generating, in the fashion industry it can be more about identifying trends and gather inspiration true research. Design concept is developed, following by design creation of specific items, where colours and styles are chosen. The designs are presented and the strong items are selected to continue the process next step, sampling. A final selection is then made before the sample production and main production. The process ends with an evaluation of the collection and specific items. The steps of the process are presented in figure 3.

3.5 Recycle

Recycle referees in our model to the phase when garments no longer can to be reused or re-designed. Recycling is referred to as:

(...) the removal of materials from a disposed product or package so that they can be utilized as raw materials for a new product or package. (Wright et al. 2011 p. 11)

Recycling consequently means that the old product is used as raw material to produce a new product. Shedroff and Lovins (2009) stresses that recycle materials are an essential part of sustainability. The authors consider recycle in the framework of circular economy truly valuable, since this is the last chance to restore material into the loop.

Muthu, Li, Hu and Ze (2012a) and Wang (2006) conclude that recycling is proven and still promising method to minimize the carbon footprint within the textile industry. Comparing production of conventional cotton and recycled cotton, recycled can save up to 20,000 litre of water per kilogram of cotton (Luz 2007; Muthu et al. 2012a). According to Fletcher (2008), textile recycling is generally accepted in the society, both from companies and customer, due to the fact that it allows the contemporary consumption patterns to continue. There is also a possibility to generate goodwill connected to the environment and social issues (Wang 2006).

3.5.1 The Recycle Processes

According to Pui-Yan Ho and Choi (2012) waste can be divided into pre-consumer and post-consumer waste. Post-consumer waste is the waste created after the consumer using the product and pre-consumer waste is occurring during the production stages (Muthu et al. 2012a).
The recycle process is easier with pre-consumer waste, due to the fact that different materials are known at hand. Pre-consumer waste occurs in several of the manufacturing processes, as example cutting, which results in large amount of waste. This waste can be sold to be recycled or be used for secondary purposes, such as isolation. Last in this chain; the waste ends up in the landfill. To reduce the environmental impact recycling is the best option, but in the decision process of what to do with the waste there are several factors to be considered. When creating something new, there must be a demand for the new material/product in order for the recycle process to have value (Wright et al. 2011).

The recycling process of post-consumer waste has been identified as a toilsome process. It consists of many steps, starting with sorting the garments into different categories. The different type of waste material needs to be recycled individually in order to be used for new products (Muthu et al. 2012a). The separation process is more complex with the post-consumer waste, since the material potentially has undergone changes within the manufacturing processes and could also consist of various materials and trimmings (Pui-Yan Ho & Choi 2012). Muthu et al. (2012a) discuss the designers’ role and responsibility in the process. The designer has several aspects to consider like functionality, quality, aesthetics, and economic considerations. However, the researchers’ emphasize that the designer should consider environmental issues, such as decisions whether or not to use mixed materials, and the recyclability of the garment. This was discussed in more detail under the re-imagine chapter. In Gulich's (2010) study about design for recyclability, he stresses that in the future design for recycling will predominate.

Recycling methods can be divided into below methods:
- Primary recycling refers to recycle a product into its initial form. This is seen as the most advantageous form of recycling, since the material is not being downcycled. The method is intended for synthetic fibre, such as polyester and polyamide.
- Secondary recycling is recycling of the waste that is used for new products, which do not have the same initial form or application as the original product. As an example, the textile waste can be used as wipers for industrial use. The new products usually get lower level properties, referred to as downcycling.
- Tertiary recycling is the method of converting waste into fuels and chemicals.
- Last, quaternary recycling is refereed to when waste is burned and the generated heat is used (Muthu et al. 2012a).

### 3.5.2 Support Tools

In order to be able to make decisions about which material to use, when adding environmental issues as well as recyclability, it is vital to have knowledge about the recyclability of various materials. A study by Muthu, Li, Hu and Mok (2012b) with the purpose of developing a model to quantify the Recyclability Potential Index (RPI) of ten common textile fibres (please see table 3). Polyester received the highest ranking while nylon ended up in the bottom. The evaluation of the fibres took into account the economic and environmental impacts in the recycling process (Ibid).
3.5.3 Problems with Recycling

Recycling of textiles is one of the well-established recycle industries (Wang 2006). On the other hand Allwood, Laursen, Malvido de Rodríguez & Bocken (2006) point out the lack of innovation in the recycle technology for textiles, where there is a need for development due to the blend of materials. The blend of different materials has increased in the clothing industry, where both natural fibres and synthetic fibres are mixed in one garment, which makes the recycling process complex (Shedroff & Lovins 2009). According to Wang (2006) the reason for mixing fibres is to increase the strength and the quality of the garment. Mixed materials are more difficult to separate than unmixed fibres; the fibre blend has therefore become a main issue of the textile recycling process. Due to the various materials within one garment, sorting of the clothes also becomes complex and time consuming (Muthu et al. 2012a). Last, the dying process of garments and accessories like zippers, buttons and drawstrings adds further complexity to the recycling process (Chen & Davis Burns 2006).

Various materials can be recycled in different amount of times (Earley, Goldsworthy & Vuletich 2010). The length of the fibre, especially the cotton fibre, gets shorter in the process of recycling, resulting in poorer quality of the fibres. This means that the process of recycling cannot be conducted over and over again (Bartl, Hackl, Mihalyi, Wistuba & Marini 2005). The existing recycle infrastructure enables some synthetic fibres to be recycled more than once, however original material needs to be put in order for the materials to be recycled properly. Other materials of less quality, is downcycled and only used in products with low value such as isolation or carpets (Earley, Goldsworthy & Vuletich 2010). Furthermore, it is a known fact that the different process of recycling needs energy that must be taken into account and balanced that against the outcome (Muthu et al. 2012a). A study by Sahni, Boustani, Gutowski and Graves (2010 in Muthu et al. 2012a) showed that recycling one ton of fibres consumed eight gigajoule of energy.

<table>
<thead>
<tr>
<th>Material</th>
<th>RPI*</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyester</td>
<td>21</td>
<td>1</td>
</tr>
<tr>
<td>PP</td>
<td>21</td>
<td>1</td>
</tr>
<tr>
<td>HDPE (Polyethylene)</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>LDPE (Polypropylene)</td>
<td>23</td>
<td>3</td>
</tr>
<tr>
<td>Acrylic</td>
<td>27</td>
<td>4</td>
</tr>
<tr>
<td>Cotton</td>
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<td>5</td>
</tr>
<tr>
<td>Wool</td>
<td>32</td>
<td>6</td>
</tr>
<tr>
<td>Viscose</td>
<td>33</td>
<td>7</td>
</tr>
<tr>
<td>Nylon 6/66 (Polamide)</td>
<td>32/37</td>
<td>8/9</td>
</tr>
</tbody>
</table>

*RPI = recyclability potential index

Table 3. Modified version of ranking of recyclability (Muthu et al. 2012b, p. 59)
3.6 Theoretical Summary and the Need for More Data

To summarize the theoretical chapter, some areas within the circular economy framework in the apparel industry lacks significant research basis. The purpose of this research is to explore current practices regarding circular economies in the apparel industry and to construct a framework for integrating circular economy practices in the Swedish apparel industry.

The authors have identified many and significant theories within the concept of re-imagine in various aspects, as well as reduce and recycle. This shows that these three areas are well researched individually, where our research adds the holistic life cycle perspective. During the literature review the authors realized the need for more data within the field of reuse and re-design. Within reuse, little or no data/theory is found within the concept of second hand as a business model that is added to the already existing clothing concepts. Few studies have been made about renting and within the concept of re-design; almost no data is found that explores this field. Therefore, research is lacking within these fields and in order to be able to construct a framework, these areas will be further discovered in the empirical chapter below.
4. Research Results

In below chapter the empirical findings are presented, where the aim is to fill the lack of data.

4.1 Uniforms for the Dedicated

Uniforms for the Dedicated was founded in the year of 2005 in Stockholm, as a private held company. Putting fashion, music and art together, the company provides menswear fashion for the progressive men of the world, under the brand label Uniforms for the Dedicated (UFTD). They operate mostly in Europe, with the flagship store in Stockholm and sell the collections at approximately 150 independent retailers. With their eight employees, UFTD aims to make a change. They want to inspire, provoke and change how the industry works by sharing their knowledge and by embracing inspiration gained from other industries, (please see appendix E for more information). The vision of UFTD is to be the most sustainable fashion brand within five years.

4.1.1 Current Value Chain

The value chain (please see figure 4) takes it starting point at the raw material, which is sourced as close to the production facilities as possible. Production is located in Europe and the collections are stocked at the inventory in Borås. The garments are sold trough the stores or rented in the collection library. In 2014, a consumer donation system to “Stockholms Stadsmission” is implemented.

![Current Value Chain Diagram]

Figure 4: Current value chain of UFTD
4.2 Filippa K

Filippa K Group AB was founded in 1993 and is now operating in 20 markets through their 36 stores, and through 740 independent retailers. The company aim to sell commercial, yet timeless fashion with high quality at an affordable price, for both men and women. The core values of Filippa K are “Style, Simplicity and Quality” that impregnate all activities they do. The annual turnover 2012 was 571 million SEK and the company employ over 200 people. (Filippa K 2012a) By the year of 2030, Filippa K wants to minimize the environmental impact by continually improve products quality, by decreasing the products environmental impacts and prolong the product’s life. (Filippa K 2012b)

4.2.1 Current Value Chain

The value chain of Filippa K, illustrated in figure 5, starts at the raw material stage, which proceed with production (mostly in Europe and in Asia). The finished products are stocked at the inventory in Borås before they are sold in the stores or rented trough “Ånegarderoben”. The clothes are used and could later be sold to the Filippa K second hand store and re-bought as a second hand product. Filippa K also donate claim to “Stockholms Stadsmission”.

Figure 5: Current value chain of Filippa K
4.3 The Five Circular R's in Practice

The empirical findings are presented in accordance to the chosen structure: re-imagine, reduce, reuse, re-design and recycle.

4.3.1 Re-imagine

The results show that re-imagine must be embraced within the company in order to change the rules of the game by making sustainability part of the competitive advantage, where opportunities is the main focus instead of problems.

4.3.1.1 Re-imagine your Corporate Values

UFTD has chosen to embrace the challenge of a sustainable development and integrated this into the core values of the company. One important aspect to bring up is therefore how the company interprets sustainability. Fredrik Wikholm expresses sustainability as being compassion, through a pragmatic and holistic perspective. Everyone carry a heritage in our soul and on our shoulders, which is something we leave behind to future generations. Wikholm puts this in relations to the apparel industry by stating that in the most utopian world, we should leave a positive carbon footprint, where one must embrace the opportunities and invest in development processes. We are only here to manage what mother earth gives us, but she must continue living in a healthy equilibrium. Anna Heinrup expresses sustainability as being respectful and Michael Lind put it into the phrasing of humility. These values are incorporated in their business strategies and have made them re-think why and how they do certain things.

Filippa K shares the view of the need for value to be embraced and incorporated within the companies, processes and products. Christina Muljadi describes their value in more strategic wording, with a less philosophical discussion, where sustainability is the precondition needed in order for the next generation to be able to live on the planet. The values within Filippa K are also well incorporated with sustainability. Focus is put on understanding the products and the ecological footprint in order to get competent and engage in changes, by having a 360-degree view of sustainability. Filippa K aim towards high goals, which are described in detail in appendix E. (Filippa K 2012b)

The brand UFTD is the result of the founders’ values. The brand is working as a platform for spreading knowledge about sustainability, with the aim to influence both companies and consumers. According to Wikholm the company exists due to their need to take part in the shift of the current status quo. UFTD aims to implementing their values and strategies in other companies, where they want to prove that sustainability and profit go hand in hand. The aim of

3 Fredrik Wikholm, Co-Founder, Uniforms for the Dedicated, Interview 10th April
4 Anna Heinrup, Designer, Uniforms for the Dedicated, Interview 14th April
5 Michael Lind, Sustainability Manager/Co-Founder, Uniforms for the Dedicated, Interview 10th April
6 Christina Muljadi, Supply Chain Manager, Filippa K, Interview 6th May
UFTD is not to bring revenue to the owner; it is about bringing revenue in terms of a better planet to the next generation. Wikholm states that the definition of revenue has become only a matter of monetary value, where he expresses that profit for the company is sustainability. Patric Wallertz\(^7\) in turn states that one cannot run a company with profitability in mind, because you loose the purpose. Profitability is only a by-product. Wikholm takes this one step further by bringing the concept of karma into the discussion and the need for giving back. UFTD aims to reinvest their revenue into textile mills and develop projects together with suppliers. Only when interviewing Lars Johan Hedberg\(^8\) (being the CFO) the financial situations are discussed, due to his position. Hedberg is stating, with confidence, that the financial situation will not limit their development process.

Filippa K considers profit to be of high value due to the need to reinvest in the company in order to develop towards a circular economy. There is also a need to pay the investors and owner, due to the current market system; revenue is needed in order to survive in this system. Elin Larsson\(^9\) is confident that a healthy company is combining profit and sustainability.

### 4.3.1.2 Re-imagine your Value Chain and Design Process

Re-imagine the value chain by aiming for a circular economy instead of a linear supply chain, where relationship between actors is of the essence, is one of the most vital results. UFTD has moved their production from China to Europe due to closer location. Wallertz states how important it is for him, as a buying director, to be able to visit the mills and suppliers whenever, which makes the location in Europe convenient. UFTD wants to work with people that are proud of what they do and play the game fair, which results in higher costs and better quality.

A couple of seasons back, 65 percent of the production was located in China and the rest in Turkey. Of the autumn/winter collection of 2014 was approximately 50 percent of the production based in Portugal and 50 percent in Turkey. For the spring/summer collection of 2015, 75 percent is based in Portugal and the last 25 percent in Turkey. Wallertz and Wikholm stress the need for long collaborations, therefore they aim to keep these suppliers and help them develop by re-investing revenue. UFTD aims to develop fabrics together, by forming quality levels that will serve as a base for a long time relationship.

By 2030 Filippa K wants to be in control of the value chain, which means having 100 percent transparency (Filippa K 2012b). Larsson is stressing the need of more transparency due to the unknown processes in the value chain, before the production stage. Creating transparency within raw material, spinning, dyeing, weaving processes are a big challenge of the industry in the contemporary society. As of today, Filippa K has suppliers based in Europe (65 percent) and Asia (35 percent). Close relationships within the product development phase are important (Filippa K 2012a) where Filippa K has been working with some of the suppliers for over 10

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7 Patric Wallertz, Buying Director, Uniforms for the Dedicated, Interview 7th April
8 Lars Johan Hedberg, CFO/Co-founder, Uniforms for the Dedicated, Interview 14th April
9 Elin Larsson, CSR Manager, Filippa K. Interview 6th April
years (Filippa K 2012b). Larsson explains that including the suppliers in the decision-making processes and goal orientation is needed in order for everyone to be on the same page. It is of high value to make everyone understand why Filippa K is acting as they do.

Within the design process, Heinrup (being the designer of UFTD) always designs with recyclability in mind, which becomes important when choosing the materials. The use of mixed materials creates a complicated recycling process; therefore UFTD uses as much non-mix compositions as possible. UFTD is avoiding all types of polyester, polyamide and viscose and is trying to increase the use of Tencel™ (lyocell). As the situation is now it is hard to find Tencel™ of high quality (Wallertz). Wikholm expresses concerns about hemp (usually seen as a sustainable material) that is becoming rougher and uncomfortable the more one washes it. The seams are also an important part of the recyclability aspect, which must be placed to be easy removable. The same goes for buttons and linings. Wikholm states that when a new collection is developing at UFTD the following aspects as considered in descending order: commercial relevance, environment, quality, comfort, and price. The design process also takes the environment in mind when choosing colours and finishing. Heinrup and Wallertz want to stress that this put some big limitations to the design process and therefore the environmental aspect is sometimes not possible.

According to Larsson working with recycled materials is important within sourcing. Filippa K is a design company and creating a sustainable design choice is therefore vital. Filippa K aims to be consistent in their design, in order to construct a long time aspect. Under the assortment planning the concept for the collection is set and within the collection the designers have sustainability goals within their activities, i.e. X percent of the material must be recycled. Larsson is however pointing out that designing for recyclability is nothing Filippa K is doing at the moment, but this is one of their main goals. The development of making the technique of recycle mixed fibres is vital, which will lead to high garment recyclability since the use of mixed fibres would be possible, a view also shared with Muljadi.

Heinrup stresses that all pieces in the collection must have a reason for being. UFTD does not have the financial capacity or the willingness to put out pieces that does not sell, however they do not embrace trends fully. Therefore a great part of the design process is evaluating to find what is working, which have lead to classic pieces. This means that UFTD designs for longevity, a concept that also Larsson and Muljadi at Filippa K is stressing. Wikholm expresses that the collections of UFTD are not designed for a wear and tear philosophy, therefore classic silhouettes are important. By creating steady foundations with silhouettes and quality standards that they feel safe with, they manage to reach timeless fashion where they only released two collections per year.

Filippa K has a goal that their products will have a long lifetime quality and the company is giving their garments an exposure of at least six months in the store. (Filippa K 2012a) Filippa K releases four collections per year, with classic styles that can be combined from all different collections (Filippa K 2012a). Larsson is explaining that adding a couple of trendy items in small quantity to the collection will bring fashion status to the company.
Lind is discussing the future possibilities of the value chain for UFTD, where he explains that the producers must reintroduce the sentimental value and respect of products, which is named the affection value. The consumer will care for it and treat it with respect, if a relationship towards the garment is created. It is therefore vital to move from conventional season thinking towards finding alternative production system, where clothes are produced after demand. Tailoring or customization might be a possible solution. Another future development of the value chain, which is introduced in the summer of 2014, is a reverse system in collaboration with “Stockholms Stadsmission”, a second hand store in Stockholm that is explained in more detail under reuse.

4.3.1.3 Re-imagine your Collaborations - for Mutual Gain

Larsson is stating the importance of collaboration in order to reach goals that will affect the society. Due to the company size, Filippa K can drive a development towards sustainability by using the value chain as a tool. As one example, Filippa K collaborates with various NGO’s in order to increase the knowledge and innovation thinking. (Filippa K 2012a) There is a need for the government to engage in these activities. Filippa K is engaging in various collaborations such as; Mistra Future Fashion, technology companies and universities in order to collect as much knowledge as possible (Larsson).

UFTD has several projects running where they collaborate with various companies and organizations. According to Wikholm they want to clarify their message by embodying it in various projects. UFTD shows creative examples of how to work with sustainability, which can inspire and create awareness. Lind is looking for partners that are share their values and have the same goals regarding sustainability.

Wikholm presented some of the collaborations partners such as; “Stockholms Stadsmission”, “Absolut Vodka” (working with art and culture), “Art come first” which combine art and tailoring and last the “Royal Opera” in Stockholm, where UFTD is a creative partner. Furthermore, during Stockholm Fashion Week in August 2014, UFTD is going to arrange a one day festival with music, photo exhibition and inspirational lectures in collaboration with hip hop performances and artists having a strong connections to sustainability.

4.3.1.4 Re-imagine your Business Opportunities

The opened mind-set of UFTD and Filippa K has helped them to see new opportunities in selling and consuming clothes. One of these new opportunities is the Collection library of UFTD and the second hand store by Filippa K. According to Wikholm there must be a possibility for consuming clothes. But it must be done in a different way, as example renting instead of purchasing clothes. Larsson is agreeing with Wikholm, but is also adding that the future business opportunities are about finding ways to let people consumer, without taking resources from the nature. Wikholm, Magnus Wiberg and Heinrup describe the purpose of

10 Magnus Wiberg, Sales Manager, Uniforms for the Dedicated, Interview April 4th
the collection library being to raise alternative ways of thinking and influencing consumer behaviour. This was also the reason why Filippa K developed the collaboration with “Lånegarderoben”, where consumers can rent clothes from the brand Filippa K. The Filippa K second hand store (run by Judith) is another business opportunity example where the company is embracing the future way of doing business. (Filippa K 2012a)

Another business opportunity is the knowledge base within the companies. UFTD is offering lectures and workshops in order to influence and spread their knowledge. Lind stating that it is truly important that they inspire other people and find new and creative ways of working in order to drive creativity towards a changing development. Being a pioneer will lead to that others may follow. Heinrup in turn explains that it is a blessing having people as dedicated as Lind within the field of sustainability, which results in business opportunities for UFTD. The demand for lectures and workshops have increased during the last three to four month, which Lind state is due to current trend in sustainability.

### 4.3.1.5 Re-imagine your Choices

Filippa K is working primarily with two tools in the value chain, the first being “Filippa K's fibre tool”. This tool is used in order to understand the environmental and the social impact their choice of materials are having on the planet. This is helpful when making sustainable decision in the product development process. The fibre tool is dividing the fabrics into four main classes, where class 1 and 2 are categorized as sustainable and class 3 and 4 are characterized as non-sustainable. As of 2012, the division among the fibre classes were divided according to the diagram (please see figure 6). The diagram shows that 37 percent of the materials are sustainable, where the rest are about to be phased out before year 2030. (Filippa K 2012b)

A similar classification tool is used by UFTD. According to Heinrup a trade-off situation between quality and sustainability rarely happens, since one does not exclude the other. It might be more difficult to decide between two materials that are good or bad for the environment in different ways. In trade-off situation regarding material, UFTD uses a classification list named Environmental Benchmark for Fibers, developed by Made By. The list is based on several aspects measuring the fibres environmental impact. On the top of the list come recycled materials followed by organic materials, third comes Tencel™, flax and bamboo (if grown right). Last on the list are the conventional fibres that should be avoided, for

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example polyester and polyamide. (Wallertz & Heinrup) According to Lind the list helps them to have a frame of reference and narrow down choices in order to make efficient decisions.

During 2012, Filippa K conducted a Sustainable Life Cycle Assessment on a Lycra top, in collaboration with “The Natural step”. The Life Cycle Assessment had three goals: first, the aim was to understand the environmental and social impact. Second, the aim was to raise awareness within the company, and thirdly to have a base for follow-ups and improvements towards reaching a sustainable development and decreasing the ecological footprint. Filippa K also aims to develop tools in order to be able to form a 360-degree view of a product, including fabrics, sourcing and transportation. (Filippa K 2012b) This action has also been taken by UFTD where Lind developed a general measurement of a garment's life cycle, where the evaluation was based on the total environmental impact.

A third tool developed during 2012 by Filippa K, was a “carbon dioxide calculation tool” that is used in the transportation and material emission evaluations. The tool is helpful in making the right decisions where improvement in these processes always is the aim. (Filippa K 2012b) According to Larsson, a fourth tool is under construction where the chemicals in the dying process are going to be evaluated to increase the knowledge at the dyeing facilities.

UFTD has started to implement the Higg Index tool, where different materials and other aspect of the products life cycle results in a numerical score. According to Heinrup, the Higg Index tool is used as early as possible in the process so the right decisions are made from the start. One advantage with the Higg Index is that the choices become concrete and this follows by an easy way to communicate the improvements. Of course, one should not blindly trust the score; rather use the common sense, since measuring a product's environmental impact is complex. As an example, if using the best fibre but the wrong dying, clearly does not make a good result. There are many aspects that need to be taking into account and that is why the Higg Index can be useful tool in trade-off situations. The knowledge of using this tool and making decisions exists in the company, however according to Wallertz it also requires some input from the suppliers. Therefore, creating long-term relationship is of essence.

4.3.1.6 Re-imagine your Future

Since UFTD does not consider financial revenue to be the highest priority, the company has a different view of their development. The vision of UFTD is to become the most sustainable fashion company in the world within five years. In order to reach this goal, Lind and Wikholm state that a lot of funding is needed. Hedberg explains that UFTD is going to establish on new markets, by opening stores in London and Paris. During the establishment phase, UFTD just need to stay above the surface and they are calculating for the transformation in terms of product development, conceptualization of communication and relationship maintenance with suppliers.

UFTD is willing to invest money and needs a couple of million SEK to make this transformation reality. Hedberg states that a turnover of 70 million SEK is the aim, which means that both external and internal capital must be raised. Lind is stressing the importance to
find the right external capital that is not controlling in terms of project. UFTD turned down half a million SEK due to this reason, which shows the extreme dedication towards their corporate values.

Wikholm is stressing the need to change the competition, from prices towards competing with sustainability, which they hope to become the conventional way of competing. Wiberg discuss this by expressing that competing within sustainability will be a positive and healthy competition. Wikholm further states that developing towards sustainability is a never-ending journey, where it feels like never reaching something.

Filippa K is clear in what they want to accomplish before the year of 2030. The company has divided their goals under four categories, described below (for more detailed information, please see appendix F).

- Environment: Filippa K wants to minimize our environmental impact by continually improve products quality, by decreasing the products environmental impacts and prolong the product’s life.
- Partners: Filippa K is determined to raise the level of partners' sustainability efforts by working in partnership with a focus on communication and long-term relationship.
- Employees: Filippa K wants to be a responsible employer who empowers its employees and encourages initiative taking as well as a balanced lifestyle. The overall target is to have employees that are proud of the company and the work we do.
- Business: Filippa K wants to be growing with care together with our partners (Filippa K 2012b p. 22).

Larsson states that within 15 year, Filippa K will have reached a circular value chain. Within this, Larsson is stressing the importance of gaining total control, which means full transparency in the value chain, from seed to recycle. Larsson is describing Filippa K business as a tree, where the root system is the supplier and sub suppliers, the stock is Filippa K and the crown of the tree are the stores. Everything is connected and one must make sure that all parts of the tree are well otherwise it will not function.

The apparel industry is changing rapidly, according to Wiberg UFTD can change pretty quickly. Being a small company, UFTD can easily reset from one season to another. The company has an open structure and embrace new suggestions. Both Heinrup and Lind stress the importance of not making decisions too quickly, without any solid ground as a foundation. According to Heinrup they have realized the value of evaluating different options and opportunities. Larsson agrees with Heinrup and Lind stating that Filippa K is not making any rushed decisions without evaluations and within a medium sized company as Filippa K, the decision making process is rather long.
4.3.2 Reduce

UFTD and Filippa K work with reduction of both pre-consumer and post-consumer waste, where they have a holistic mentality that is visible in their everyday activities. The companies have a long-term perspective towards sustainability and have realized the fact that our natural resources are limited. According to Muljadi, reduce is one of the biggest challenge in the textile industry and the most important activity in order to reach a circular economy.

4.3.2.1 Reduce by Collaboration

Wallertz expresses the need to create long-term relationships built on partnerships, in order to be able to develop towards sustainability. The mills and weavers seem almost to be a part of UFTD, since the company want to reinvest in the textile mills or weavers they collaborate with. Muljadi is stressing the need to collaborating with educated and innovative suppliers, where a mutual partnership is built in order to reach the common goals.

UFTD has changed textile suppliers during the last years, resulting in movement of production from Asia to Europe. The main reasons for the move are twofold; local sourcing which results in better relationship and decrease in transportation time and emission. Wallertz states that the company will be able to send products direct from the production facilities in Portugal to the retailers, therefore they aim to phase out the distribution centre (DC) in Borås (Sweden).

The inventory of Filippa K in Borås is a valuable asset in order to optimize and maintain a good support function for the retailers. Larsson is stating that in order to gain a good purchasing precision, a DC needed. Their production facilities are also in need of time management planning of the capacity. Placing small orders, which may reduce the need of an inventory, is stressing their working environment, which is not the most efficient solution. Vendor Managed Inventory has created stressful environments where working overtime and pushing the boundaries of the social work codes is common, which Filippa K is disaffiliate. Due to the small-medium sized company as Filippa K is, having an inventory is vital. Muljadi is stating that the size of the company is a factor influencing the VMI. The bigger the company the more control of the production facilities is gained and power to place demands.

Filippa K develops their collection in close collaborations with suppliers in order to achieve the aimed quality and price, where quality is the non-compromising factor for Filippa K. In order to be able to reach the goal of having 82 percent of the Asian transportations by sea, it is important to cooperate with all suppliers in order to reach an efficient production planning. Collaborations are as vital for the European suppliers (65 percent) as for Asians suppliers (35 percent). Filippa K’s suppliers in Italy and Portugal do delivery by road, making the time factor not as vital as by sea. Collaborations in the product development phase are equally important in order to reach sustainability, which demands close relationships. (Filippa K 2012a)
4.3.2.2 Reduce your Waste

Wallertz explains that UFTD see a huge difference in terms of waste management when working with suppliers in Portugal and Italy compared to the Asian countries. As one example, in the Prato area (north of Italy), the waving mills have been working with recycled fibres from the beginning and developed a core competence. The quality is as good as any other fabric and used as linings in Gucci handbags. These waver mills have a closed system, where no waste is generated and have their own energy plants with hydro or solar energy. The plants excess power is put out to the public electricity net, meaning that these mills have a positive output system.

Wallertz further states that the waste material generated from the production in Turkey unfortunately is thrown away, but due to the social development and infrastructure system in Portugal, they manage the waste handling well. They sort the waste according to fibre and sell it to trading companies that in turn sell it to recycling facilities. Wikholm, who states that UFTD is not producing garments in need of too much fabric or that generates too much waste, explains another example of waste management in UFTD. The visual aspect is below waste in the decision hierarchy. Wikholm states that they are proud of collaborating with good suppliers, but not all of them are as good as the Prato wavers. Important though is to stress that the lowest level is high.

In Filippa K, traditional tissues, used in packaging and transportation, are removed in most of the products, only in delicate and silky products the tissue paper is used to increase stability. Filippa K aim to proceed with more products, which is accounted for as having a big environmental effect, since they used 1500 kg paper before this action. The company is taking the waste management handling one step further by collaborating with one of the suppliers in a project in order to get educated in the reduction process of waste. Larsson is also pointing out that the recycle system within the productions phase is well developed, both in the Asian and European market, due to the monetary incentive where the production facilities can resell the waste. But Larsson is also stating that the full value of the waste is not embrace, there are more optimal ways of using spill such as creating accessories.

4.3.2.3 Reduce by Information

Wallertz stresses the need for retailers informing consumers about materials and care instructions, in order to increase the knowledge among the consumers. Wikholm adds that they communicate maintenance, where they want the consumer to care about the garment emotionally. The core communication of UFTD is based on transparency. UFTD always want to lead by example and is therefore asking the consumer if they really need to buy the garment, in order to reduce overconsumption. Wikholm points out that there must be room for consumption, but the consumers must together rethink the consumption patterns.

Filippa K has developed a washing soap in order to bring a topic of conversation to the surface. Larsson states the need to bring back the respect of the garments, due to the enormous passion, love, and craftsmanship that is taking from the seed until it is purchased. By offering a washing
soap brings Filippa K closer to the consumers and gives them a chance to converse about the user phase and washing habits. Larsson is further pointing out that the knowledge of caring for the garments have increased, since the consumers have started to wash in lower temperatures.

UFTD promotes not washing the garments. Both Wallertz and Wiberg explain that UFTD has added information labels inside their garment stating that one should consider washing in cold water or hang the garment outside, which is one way to direct influence the consumer user phase.

Influencing the consumer and the society in order to become more sustainable is part of the daily operations at UFTD. Lind is stressing the need to lecture and spreading the knowledge they possess as a pioneer in the industry. An activity considered being more important than conduction a runway show during fashion week. These influence actions have the last three to four month given a visible result as a form of communication respondents, where sustainability lectures is requested often. The outcome of influencing the consumer and other companies is reduction in the user phase for the former and reduction in value chain processes for the latter.

4.3.3 Reuse

The results show that the companies have started to develop practices towards a circular economy, where they have taken a couple of direct actions within the reuse process and see potential development strategies.

4.3.3.1 Reuse by Renting

Within the reuse phase UFTD has developed a collection library, where suits can be rented from cost of 10-20 percent of the price and could be bought after the renting period. This is a direct action towards a circular economy. The Collection library is about increase the turnover of clothes, without actually consuming. Wikholm is putting the collection library into the phrasing of collaborative consumption; where he states that not owning material things contribute to life affluence. When putting this concept into an ecological economy perspective the result is great. Lind is taking this one step further, where UFTD is offering a rental collection that is contradictory to the doctrine that our modern consumption society is based on. Therefore offering a collection library is provoking and makes people rethink their consumption habits. There are not many problems in this system and it is a proven business model in other industries. When offering this service the playful consumer will get the opportunity to consumer fashion without buying. A development potential is the communication and visual concept about the library.

With this business model they wanted to show that they did not make less money by offering rentals, but what they did was reducing the environmental stress. UFTD wants to develop the library, adding more pieces to the collection as well as offer this in department stores such as “Nordiska Kompaniet” in Stockholm. Wiberg states that they didn't rent a lot of clothing, only about five to ten pieces, the collection library is meant for a topic of conversation rather than a
cash cow, but the business model has potential. Filippa K’s action of renting clothes is by collaborating with a Swedish non-profit organization named “Lånegraderoben”; a rental store for clothing (Filippa K 2012b). Renewing the wardrobe temporarily, without over consuming is a direct action towards a circular economy. Filippa K is at the moment evaluating and calculating the possibility to integrate a rental section run by Filippa K, since Larsson states that this is a nice circular practice.

4.3.3.2 Reuse by Resell

Wiberg and Lind explains that overproduction of clothes is a big issue in the contemporary society. As an example; eight outdoors jackets are produced on average for each person each season, where one person usually does not buy a new outdoor jacket every season. Lind also states that sales are a lock in the system that makes the consumers over consume. In an optimal world, companies would only produce what is needed and putting garment back into the loop. Second hand products will also decrease over consumption and increase the longevity of a garment.

Filippa K stresses the need to offer the products a second life, as a part of maintaining the product in the consumption/reuse loop as long as possible (Filippa K 2012b). Filippa K developed their environment policy in collaboration with The Natural Step, an organisation with the aim to accelerate the sustainable developed in the society. During this process, Filippa K decided to develop a second hand store that is run by Judith in Stockholm. Larsson explains that they saw a second hand store as a natural step, since this provides the opportunity for their customers to sell and buy Filippa K pieces and longevity is reached. Filippa K is about to integrate this business model into the organization, due to profitability of the business model.

Wallertz state that he sees second hand as a potential system for sustainability that is maintaining the clothes in the consumption/reuse loop. However, there is a need for UFTD to become a bigger company in order for this system to work in practice. UFTD needs to sell more clothes in the first round in order to be able to collect garments. According to Heinrup, the second hand clothing has increased in value and status. Last, both Wiberg and Lind are positive towards the idea of developing a second hand department.

4.3.3.3 Reuse by Repair

During the interviews the repair concept was also discussed, where Filippa K was positive to integrating this into their business practices. Larsson is embracing that repair service is not only a matter of maintaining the garment in the consumption/reuse loop, but also a valuable connection point to the consumer where relationship occurs. Muljadi is being positive when explaining that the craftsmanship is coming back. Muljadi states that this is needed in order for people to change their consumption habits, which may also create work possibilities for people in Sweden.
Different opinions came from the employees of UFTD. First of all, everyone stress the fact that they aim to give the collection high quality from the beginning and therefore a repair service might not be needed. Wallertz consider that the quality of the fibre is getting poorer during the last decades, which he considers is explained by the difference of how the crops are growing in the contemporary society. Formerly, the chemicals used were good for the plant, but bad for the environment, which made the crops stronger. Today, the chemicals used are better for the environment, but not as good for the crops in terms of quality gained. Both Wikholm and Wiberg state that the best solution for UFTD today is to collaborate with tailors, who can repair the garments professionally.

4.3.3.4 Reuse by Donation

A system that will be put into practice at UFTD is a convenient system for donation, in collaboration with “Stockholms Stadsmission”, a Swedish based second hand store reselling donated products. Wikholm explain this as a collaboration that has been developed together with an advertising agency and DDB (logistic partner) who is the connecting point between UFTD and “Stockholms Stadsmission”. When buying something at UFTD you get a bag with the text; you bought something new. When turning the bag inside out it says; you donated something old, with a pre paid proto and the address to “Stockholms Stadsmission”. The proto is paid for by DDB and in the initial stage the bags are paid for by the advertising agency.

The donation system makes it easy for the consumer to send an old garment back into the loop for the purpose of reuse. Wiberg states that this will lead to a change in the consumers’ behaviour and change their passive actions. The launch will also lead to media attention and Wikholm hope that UFTD can pitch this idea to other companies in order to make a bigger difference. When developing project with external parties, a problem is the time factor, which was the biggest problem in this project.

Likewise, Filippa K is working with donations, but not in terms of an infrastructure system for the consumers. The company collaborates with “Stockholms Stadsmission” where they donate both turnover from the sample sales as well as pieces from the collection form the Filippa K outlet warehouse. In 2012 Filippa K donated 1100 pieces. Filippa K is also donating all claims from the Swedish stores, which in turn “Stockholms Stadsmission” resells in their second hand store, uses as raw material to the remake project or donates to homeless people. (Filippa K 2012b)

4.3.4 Re-design your Products

Re-design is the concept less explored in the scientific community and is not common in the business society. According to Wikholm, re-design is viewed as something artistic performed in an atelier that can be run as a project; Wiberg shares this view. Wikholm further states that re-design are more of a gimmick than something that will work in the long run, with a positive effect on the environment. When a garment is re-designed it often become one unique style, which makes it hard to sell large quantities. This may result in inefficiency. Wallertz identified the disadvantages to be to find a supplier of used clothes and the financial aspect of investing in
an atelier. In conclusion, UFTD sees re-design as inefficient when trying to reach a closed loop value chain, due to the small-scale sale potential.

According to Heinrup, if implementing re-design considerations must be made early on in the design processes. As example designing extra long hems or placing critical seams so they easily can be changed. In the current design phase Heinrup calculate the possibility enlarging the seam allowance, in order to make a blazer bigger if the body may change. According to Wikholm the positive aspect of implementing re-design is an opportunity to lead by example in the industry. Heinrup points out that anything that can extend a garment-life is relevant and positive.

Studio Re:Design was a project with the purpose to investigate how material waste and used clothing could be used as a raw material instead of using virgin fabric, with the aim to commercialize the prototypes. According to Ellen Niklasson\(^1\) the main conclusion they saw during the project was that material is not scarce commodity; instead virgin fabric is seen as scarce. It is important to investigate the value of the non-virgin fabric. Using non-virgin material must be economic defendable.

According to Niklasson, the greatest challenge in order to implement re-design in the value chain is the logistical system. Today, some organizations such as the Red Cross sort fabrics, but this action is needed on fibre level. These organizations are usually based on voluntary work, which must be commercialized and implemented in the value chain. Niklasson do not have a clear solution in mind for this system.

Niklasson explains that the Swedish government is evaluating a suggestion about implementing producer responsibility in the textile value chain, as Sweden has today with paper, which is at the moment investigated by “Naturvårdsverket”. If this is going to be implemented, some drastic changes within companies must occur. Therefore the knowledge about re-design is valuable. Another main problem is the need to change the consumer behaviour and attitude. The consumers have a specific view of how a product should look and feel; therefore it takes a lot of effort in order to influence the consumer to accept that all products in a specific group might not look the same.

The difference between a design and a re-design process is when the material is entering the process, please see figure 7. Within a conventional design process, the material is discussed when the sketches are ready, as explained in detail in the theoretical chapter. In a re-design process the material is the starting-point, putting limitations to the re-design process. Niklasson explain that the designer within the project was frustrated, since they realized that the

\(^{1}\) Ellen Niklasson, Project Manager Studio Re:Design, Interview conducted 14th April.
initial idea sometimes could not be put into practice. In the future, Niklasson believe that the companies will realize the value in having control of the product after the user phase, but the due to the contemporary situation Niklasson think that re-design will be outsourced to a third party.

### 4.3.5 Recycle

Recycle is the last step in order to put garments back into the loop, which is the biggest challenge within today's business society. UFTD and Filippa K are hopeful and positive towards a development and take some direct actions within this field.

#### 4.3.5.1 The use of Recycled Materials

UFTD uses recycled materials in a large extent in their collections, such as recycled wool, polyester and cashmere. Recycled materials are highest on the company’s list of qualification regarding purchase of material. Larsson explains that Filippa K is mostly using recycled polyester and wool, but the company is also mixing it with virgin fibres. According to Wallertz, sourcing recycled material of high quality is not a problem for the autumn/winter collections, when thicker and rough fabrics are needed. It is a bigger effort to find recycled materials of high quality for the spring/summer collections, due to the access of different materials. UFTD is well aware of this and therefore start the sourcing process early in order to be able to meet deadlines. Within the autumn/winter collections recycled wool is usually used, since this is easier to find than recycled Flax and Tencel™ (lyocell). UFTD does not use all types of recycled materials just for the sake of it. Quality is still an important factor to consider. For example cotton is common to use in the spring/summer collections but is avoided because of the poor quality, since the fibre length of recycled cotton is shorter.

At UFTD, finding suppliers that produce inner linings, threads, bottoms, and labels in recycled materials is hard to find. Another problem is that the suppliers are technology companies that does not focus on the aesthetic aspect and are more targeted to the outdoor and sports companies. A possible solution is to develop fabrics together with the suppliers, which of course will require some resources.

#### 4.3.5.2 Recycle your Waste

During the production phase, Wallertz and Larsson explained that the manufacturers of UFTD and Filippa K collect the waste material. The fabrics are sorted according to fibre and sold to trading companies that in turn sells it to recycling facilities, usually based in South America.

#### 4.3.5.3 Reverse your Value Chain

The greatest challenge according to Wallertz and Larsson is the reverse system, i.e. how to get the products back in the loop after the user phase. Filippa K is aiming towards collecting the
garments in the store, which will go to the second hand store (if the clothes can be resold), to donation or recycled and used again as virgin material.

This is connected to another issue: the lack of infrastructure for recycling textiles. UFTD is lacking a direct strategy towards reverse the value chain for recycling. Wallertz stress that in order to reach a circular economy, the infrastructure must develop. Heinrup believes when recycling technologies are becoming available; recycling of fibres will be part of the everyday activity. Muljadi and Larsson are explaining the collaboration between Filippa K and Re:Newcell, a company that is research and experimenting with recycling (splitting) of mixed fibres. The development has been successful and Filippa K and Re:Newcell have managed to create a recycling technique for mixed fibres. If the technique is commercialized, there is no need to use non-mixed fibres when designing for recyclability, leading to a wider framework in sourcing and design.

Wikholm explains that UFTD is trying to affect the society in the ways they can and have capacity for, where they are spreading their knowledge about sustainability and trying to raise awareness and most importantly inspire, through lectures and collaborations with other cultural and artistic areas. In the long run, this can lead to improvements of the infrastructure and investment in new recycling technologies, which is needed in order reach a circular economy.

4.4 Empirical summary

The purpose of this research is to explore current practices regarding circular economies in the apparel industry and to construct a framework for integrating circular economy practices. With these results the authors bring more knowledge into the field of circular economy in general and reuse (rental, second hand and repair) and re-design in particular. In the empirical chapter the authors have also shown that a main problem is lack of a developed infrastructure for recycle as well as trade-off situations concerning material.
5. Analysis and Discussion

In below chapter, the empirical results are analysed and discussed with theory in order to draw parallels and find new conclusions that are needed in order to answer the research questions. Second, the circular economy model and what is needed in order to reach this ideal model is explained.

5.1 The Circular Economy Model

As previously presented, the circular economy model below has been elaborated and developed through the first stage of the literature review and during the interview with UFTD. The model was constructed with regards to the need to reach circular economy for a sustainable development, in combination with the assumption that conventional supply chain management is obsolete due to the trends in sustainability. The circular economy model consists of five constituents: re-imagine, reduce, reuse loop, re-design loop and recycle loop as illustrated in figure 8.

![Figure 8: Model, integrating circular economy practices](image-url)
5.1.1 Sustainability is Respectfulness, Humbleness and a Heritage

Re-imagine is a fundamental process in order to cope with contemporary condition, where thinking more creatively is of essence, a view shared by Esty and Winston (2006), Fletcher (2008), and Pui-Yan Ho and Choi (2012). The results show that UFTD is far more extreme in their level of re-thinking where they are putting mother earth as their priority instead of creating revenue. What is important to point towards is the accumulated embracement of the values in the organisation. The authors is therefore stressing the need to actualizing the theory by stating that the disconnection between actions and consequences must be filled, by apprehension, in order find the incitements needed to develop towards a circular economy. The power is found inside the organisation and by collecting people with the same environmental values and where the incitements are obvious, may lead to a thorough change.

Niinimäki and Hassi (2011) and Pui-Yan Ho and Choi (2012) are both agreeing that re-imaging creates new business opportunities within the value chain and affecting the end consumer. UFTD has managed to embrace and innovate their brand that is working as a trampoline in order to spread knowledge about sustainability, with the aim to change the current rules in the apparel industry. Thus, UFTD has realized the need to think outside the box and a co-occurrence theme in the company is to lead by example. One concern is that UFTD is having too much faith and too high values that creates a utopian worldview. The authors stress the need to develop clear and focused strategies and continue to evaluate the practices to reach a circular economy. Filippa K is being more corporate as a company; they emanate a positive belief that is backed up by concrete activities, plan, estimations and goals. Due to the current market economy that is built on capitalism, the need to bring revenue in order to survive is vital. Revenue makes the company grow and the power to change the rules will increase.

5.1.2 Imagine a Sustainable Value Chain with Sustainable Design

The authors have identified collaborations as being of highly value. UFTD has close collaborations with all their suppliers, where they aim to develop towards a circular economy together. It is clear that they are mutually dependent on each other, which the authors consider being caused by the company size (meaning small orders). Filippa K considers the relationship should be partnership based, where deep collaborating brings out the best results. These results are backed up by theory. Wright et al. (2011) states that companies are dependent on stakeholders, such as the government and customers, in order to get the product back into the loop.

An interesting conclusion is that the need for relationship engagement seems to decrease by the company size. Filippa K considers the value of a relationship to be important, but the company is not as dependent on their suppliers as UFTD. The engagement of the relationship, with their suppliers, is thus an important conclusion. Re-imagine also means that corporate values must impregnate all company activities, relationship and goals. This leads to that collaborations are usually based on other values than profit and price negotiations, since quality and sustainability is of top priority in the companies.
Going back to local supplier collaboration, as well as rethinking the collaboration with suppliers, is what Pui-Yan Ho and Choi (2012) suggest, which may reduce logistics related waste and energy. This is agreed with in this research where the collaborations of these companies are based on trust and partnership in order to overcome problems with delivery and production. Both companies are based in Sweden and their strongest markets are in Europe. Both UFTD and Filippa K have mostly of their production in Portugal and Italy. The recent move to Europe in both companies show they realise the benefits of local collaborations for sustainability. The authors see development possibilities of the circular practices, where the need for collaborations across local value chains could increase. Activities such as transportation and administrative organization could be shared between companies that may also lead to shared and increased knowledge and a collective development towards sustainable practices.

Eco-design, design for the environment, design for recyclability (van Weenen 1995) and slow fashion (Fletcher 2008) is presented as being important to bring into in the design process. Both Filippa K and UFTD are having an environmental approach in the design function. UFTD is not using non-mixed materials in order to avoid the connected recyclability problems. They chose the materials with big concerns, avoiding the materials that are stressing the environment. The company is mostly working with recycled materials. The use of recycled materials is also high in Filippa K. The most important aspect is that the company will phase out all unsustainable fabrics before the year of 2030. The authors consider this raising the bar of the rules in the industry and challenge the boundaries, which might lead to increase use of sustainable materials in other companies. The Filippa K pilot project of the circular products, with total transparency also raises the bars. The authors believe the need to communicate and get PR for these projects in order to increase the acceptance in the industry and among the consumers, since low communication was identified as a weakness.

Longevity is an important aspect that Filippa K and UFTD are embracing, where they both consider that one piece of clothing must live as long as possible in order to decrease the environmental harm. Embracing trends is therefore not a top priority, instead the results show that finding classical and timeless silhouettes with high quality and releasing few collections per year is important. This result is therefore agreeing with prior research; maintaining the garment in the first user loop is vital, which require design for longevity (van Weenen 1995). An important aspect is however the limitations that this brings into the design process. Filippa K is dealing with this problem in a direct way, where the collection consists of a few fashion twisted items of low volume that can be combined with the classic and basic collections. UFTD states that the company do not embrace trends, but their collections are nevertheless trendy. Simultaneously UFTD top priority when designing a new item is commercial relevance, which may seem contradictory to their sustainability values.

The contemporary consumption dynamics, having a wear and tear thinking, are leading to short product life cycles. The value of a product has decreased due to low emotional attachment. Co-creation and customization may create the emotional value needed in order to give the apparel products an extended life (Niinimäki & Hassi 2011). The results show that UFTD has realized the need to reintroduce a sentimental value, which could be created by tailoring and
customization. Within Filippa K the increased concern of disrespectfulness towards the garments is clear. None of the companies are working with co-creation in practice, which show that the production system developed for the conventional (fast) fashion system does not fit. The authors do consider the idea of co-creation as being good in theory. This production system is not in line with the current production system, which will make it complicated to implement. The case units also explain that the customers impatient and do not want to wait for the garment. To increase the emotional value of a garment the authors suggest including more information about the garments. If the customer get a feeling of how much effort and how many people that are involved in the production process of one garment might affect the customer’s feelings about the garment. One garment with high emotional value will be better maintained and generating a longer lifetime in the consumption loop.

5.1.3 Sustainability is Your Choice

According to Byggeth and Hochschorner (2006) the path towards sustainability is not always clear, due to trade-off situations that may occur along the journey. The results support previous research by showing that trade-off situations are occurring within the daily operations. The companies are putting high effort into creating the win-win-win situations, where they are putting sustainable products out on the market as a choice for the consumer. Byggeth and Hochschorner (2006) are pointing out that support tools are needed in order to make efficient decisions in these trade-off situations. Filippa K has developed tools, one for material assessment and one for carbon dioxide assessment. UFTD is using one material assessment tool and is at this stage implementing the Higg Index tool.

The results show that these tools are helpful since they frame the situation and put the decisions in concrete numbers or categories, which makes it easier to understand and communicate. With these tools backing up decisions, the authors consider that the companies dare to make decisions that are usually outside of the comfort zone. Secondly, these tools may have an educational purpose within the organisation and suppliers, which may lead to a faster development process towards a circular economy.

5.1.4 Imagine a Sustainable Future

Both Werbach (2009) and Pui-Yan Ho and Choi (2012) conclude that a change within the company takes time; therefore it is important with a long-term perspective. The results agree that a long-term perspective is needed, where Filippa K has set their goals 15 years ahead. The company has clear strategies and knows the path that will help them integrate circular practices in the organization. Decisions must take time and cannot be rushed. The authors therefore want to stress to find a business model that is in line with slow fashion.

UFTD is not being humble by stating that they are aiming to be the most sustainable company in the world in five years. In order to reach this goal, the company needs to develop production processes, recycling technology and change in consumer behaviour and develop a reverse system. The authors therefore are stressing the need to not postpone the actions needed in order
to start developing towards a circular economy. One usually hears that change is hard, takes time and is usually connected with a lot of resistance. If a company wants to embrace a sustainable development, it is of the essence to take action. It might be a cliché, but it is so true in this case: actions speak louder than words. Being realistic is also important, since companies are dependent on other parties. Giving realistic hopes and conditions is vital.

5.1.5 Reduction is a Collective Engagement

Local sourcing, in combination with close supplier collaboration is preventing waste in the value chain. Collaborations are needed in order to develop sustainable material, decrease stocks and having shorter transportations (Pui-Yan Ho and Cho 2012; Sloan 2010; Caniato et al. 2011). The results clearly show that a collective engagement is vital in reduction of waste. Having an individual focus is not healthy for a company’s value chain, since it is making it dysfunctional. The results show that the close relationship is needed in order to develop high quality garment. In terms of mode of transportation, local sourcing reduces the flight cargo needed in rush order situations, which decrease the carbon dioxide emission. Furthermore, having local sourcing creates a better situation for visits and monitoring strategies that the authors consider are needed in order to get all stakeholders on boards in the development towards a circular economy.

An important contribution that the local sourcing is bringing into UFTD is the future closing of the distribution center in Borås that will lead to a big reduction of a non-value adding process. When discussing the inventory with Filippa K, the VMI strategy is not an option for the company due to the quantity of orders and the need of safety in capacity planning. The authors want to raise the social aspect of bringing safety for the workers in production facilities, which is often neglected. It is therefore of high value to develop partnership based relationships to be able to monitor the working conditions and being able to plan the capacity.

It is vital for Filippa K to pre-plan and place order beforehand, therefore the inventory place an important role. Filippa K is highly dependent of the inventory on time delivery to the retailers. One important conclusion is that having an inventory is individualistic, which must be evaluated within a company. All companies have different setups and preconditions to work with, which means that this strategy might not work in general terms. The authors consider that the smaller the company, the less need is of a distribution center. Due to UFTD expansion plans, a distribution center could be needed in the future, which the company should consider before closing the distribution center.

5.1.6 The Sins of Waste

The basic seven waste of muda was presented shortly where reduction of the wastes is vital in order find the path towards a circular economy (Harrison & Hoek 2011). More importantly, waste management system is needed in order to be able to reduce waste, where feedback loop is of essence as well as finding multiple uses of products and resources (Seadon 2011).
The results are more extreme when discussing management of waste, where some suppliers is working within a closed system in terms of waste and energy. In Italy energy is put into other systems, meaning that the waivers are having a positive effect on the environment. Last, UFTD does not produce garments in need of too much fabric.

Putting this in relation to theory, it is clear that the Filippa K and UFTD are having a more extreme view waste management, where the seven wastes of muda are focusing too much on the production processes. Reduction must be embraced within the entire value chain and in the creative process, which is a fundamental point in this model. The unused employee creativity is a waste that many companies are not trying to manage efficiently. The authors consider that embracing the collective creativity may lead to waste reduction, as the tissue example at Filippa K. The authors therefore consider a clear evaluation of the sins of waste might lead to an even better waste reduction process, since the aim of a circular economy is zero waste.

5.1.7 The Company and the User Phase

Theory states that the information provided of how to care for the garments are through care labels and tag, however little or no knowledge is gained through these (van der Merwe et al. 2014). This is agreed with Niinimäki and Hassi (2011) who also consider the communication towards the consumer about care instructions must increase. The result show that retailers must increase their information and responsibility must be put on the companies in order to reduce user phase waste. Communicating in a different way is embraced, which the authors consider may lead to increased knowledge. UFTD is trying to be more innovative in terms of care label where they are putting information encouraging not washing the garment. Whereas Filippa K has developed their own washing powder (in collaboration with Tangent Garment Care), that is environmentally friendly and developed to be caring for the garments, with the purpose of helping their consumer.

The authors consider more communication is needed in order to increase the knowledge, where openly discussing and presenting the garments life cycle phases and how to care for it is needed. UFTD is also taking this one step further by questioning the consumer if he or she is truly in need of a new garment before the purchase. This shows that sales figures and KPI comes after the environment and the company values; a vital point in this research. Communicating the importance of longevity and how to reach it would reduce waste in the user phase and this will bring us one step closer to a circular economy system. A suggestion by the authors that also is shared by Niinimäki and Hassi (2011) is to add information of how many washes the garment can handle or the lifetime of the garment. This information can help the consumer to make better decisions and the unnecessary washes will probably be reduced. This action will also lead to more transparency in the companies.

Considering disposal, Carrigan and Attala (2001) clarify that the personal benefit of disposing a garment is based on more wardrobe space and boredom of clothes, instead of thinking in terms of sustainability. Information and education must therefore increase in the area of disposal and the responsibility must be moved from the consumer to the producer/retailer (Lee et al. 2013). Suggestions are not presented in order to develop these systems. The results in this
study are presenting suggestions in order to develop reverse systems, where donation, second hand and rental are three of them. This is explained in more detail under reuse. However, the authors want to raise the fact that the companies should embrace more efforts into overcoming the problem of getting the consumer more engage in caring for the garment, which will lead to longevity.

5.1.8 Use and Reuse

Laitala and Boks (2012) stress the need to prolong the lifetime of a garment, which will lead to positive effects on the environment. The development of the collaborative consumption is positive in relation to reusing products. In specific, the demand for second hand clothing has increased (Heinrich 2013). The results show that second hand clothing have increased in value and theory state the increase in demand, which shows a clear potential within this area. The positive approach also contributes to the author's confidence that second hand is a vital part of a development towards a circular economy. As the result showed, UFTD has been in the market to short to be able to develop a second hand store or department, however in the future it will be a good strategy towards a circular economy.

Filippa K’s second hand store is delivering both profit and goodwill, at the same time that it is not contributing to consumption of new production. Filippa K is developing a plan for opening of in-house owned second hand. At the same time, cannibalism might occur within the brand itself. Since sales figures and revenue should be put secondly as discussed above, offering the service of selling and buying second hand close should be more important. This will encourage disposing the garment at the store, instead of throwing it away. The authors consider a convenient system is lacking in order to commercialize this business model. Offering second hand clothes online and sending clothes by post to the administrator might lead to a higher turnover of second hand clothing. By offering a department in the flagship stores may also lead to a higher turnover and the maintenance of the garment will therefore increased. The authors consider the second hand concept to work in all established apparel companies in the market, having high quality and a larger amount of sold items.

Since the demand for renting goods (including clothes) has increased, in combination with the benefits of sharing a product (Moeller & Wittowski 2010) makes the rental service a clear development practice towards a circular economy. Theory thus states the need to develop a system for renting (Niinimäki & Hassi 2011), which is something that the case companies have embraced in two different ways. UFTD with their rental service being a collection library is aiming towards a change in the user behaviour, by offering an alternative way of consuming clothes. They are proving that renting garments is not a dissatisfactory business model; it is rather a satisfactory one being both environmentally friendly and profitable. Big development possibilities are waiting, which is a vital part of the circular economy value chain.

Filippa K is using an external partner with whom they sponsor with clothes to rent. Filippa K does this with the aim to offer an alternative way of consuming, by not over consuming. Due to results positive approach to an internal integration of renting goods and the already developed rental business model at UFTD shows the strength in the rental activity as a practice for
reaching a circular economy. One should consider what types of clothing that can be rented. The clothes must have good quality in order to last and a rental service for the companies selling suits or similar items may be very efficient. Implementing a rental service will also contribute to a wider group of customers, which may increase the revenue.

When the garment is decreasing in looks and value, the need of repairing must be considered, which may postpone the lifetime of a garment (Laitala & Boks 2012: Niinimäki & Hassi 2011). In the research by Goworek et al. (2012), repairing is also a cost efficient action. The results show that this activity is not embraced in the case companies today. The companies state that the quality must be as high as possible from the start. On the other hand, the quality of the fibres, fabrics and the clothes is decreasing due to the change in chemical use.

The authors therefore consider a repair service could help the company in order to develop towards a circular economy value chain. Repair is also connected to the emotional attachment, as discussed above. Niinimäki and Hassi (2011) explained that if consumers are more emotionally attached to a garment, the motivation to maintain the garment would increase. Therefore the authors suggest adding a repair service, which will increase the emotional attachment and the longevity of the garment. UFTD and Filippa K are collaborating with local tailors in order to the able to offer the service, which might be a possible solution if the costs of offering the service in-house would be too high. The service is thus an important connection point to the consumer that the authors consider will deepen the relationship with the consumers. By integrating repair as a service of the organization will lead to new work possibilities and adding a circular practice in order to reach sustainability. Due to this significant result, repair is added to the model as a separate activity.

5.1.9 Donate for the Environment

The current theory focuses on donation to developing countries or second hand. Donations are a substitute for new garments, which according to Farrant, Olsen and Wangel (2010) will lead to environmental benefits. The scientific community is lacking knowledge about in what ways companies can embrace the donation system as a circular practice. The results show innovation thinking where UFTD has integrated a donation system using their plastic bags that gives another life to the garment at “Stockholms Stadsmission”. Filippa K is also donating to this organization.

The authors want to raise the fact that getting people more emotionally engaged and educated is important in order for donation systems to work. Textile donation is generally accepted in Sweden, which will lead to positive effects when UFTD is launching their donation system. The authors believe that donations will increase in the future due to the positive effect both personally for the donator, companies and the environment. A donating function of used clothes could be implemented in all apparel companies. One risk with donation is that the individual is donating clothes to be able to buy new clothes with a good conscience.
5.1.10 Re-design your Products?

In the initial model (please see Figure 8, page 51) the re-design concept was added as a circular practice; a process that could take place when the product was consumed or when changes according to trends was needed. Early (2011) consider it to be more valuable to re-design a product, instead of recycle it, because of the loss of value. Due to the unexplored area in the research community, the results from this study are contributing with new facts.

The results show that the re-design process is inefficient, due to the following reasons. First, reaching a higher value of the product is a difficult process in need of artistic and creative resources, which might not be available in the store/studio. Second, a re-designed product is not easy to sell as a commercial good, since the quantity is low and the consumers fashion thinking is locked into a system where all products should look and feel the same. The third reason that the authors found is connected to the logistical system, which is lacking in the society today. Without having consumers returning textile and a proper sorting system for the non-virgin raw material is creating limitations for the re-design process.

The last reason needs a small background explanation. According to Studd (2002), the conventional design process start with the planning and the creative process, where materials are connected afterwards, to the design concepts. This brings us into the last limitation with re-design. Due to the difference between the design processes; where the re-design process start with material evaluation and alter goes into the creative process, create an unknown work process for the designers, which brings limitations both in creativity and design. The authors consider that re-design will not be embraced and developed as an efficient and commercialized project within companies. Due to above reasons, re-design is excluded from the model, where a suggestion is made that this is a process that could be outsourced. Re-design could however be an activity that will bring companies closer to a circular value chain.

5.1.11 Recycle is your Last Chance

Recycle the textiles is the last step towards a circular value chain. Muthu et al. (2012a) and Wang (2006) states that the carbon footprint is minimized and this is a promising method to reduce the stress on the environment from the textile industry.

The use of recycled materials is well practiced and is the most basic form of entering a circular economy. The companies do uses and promote this activity to the external stakeholders. It is important to know what materials can be recycled without losing its quality, since the recycle technique might degrade the fibre. Having something concrete to base decision on is vital, which is where the Recyclability Potential Index (RPI) comes into the picture, developed by Muthu et al. (2012b). The result shows that using tools such as RPI is useful in decision-making. The case companies both uses different lists and tools to evaluate the use of materials. Knowledge about this area could be complex and time consuming, as presented in the result. The authors are therefore emphasizing the need to develop tools and practices in the organization in order to continue the development process in the use of recycled materials.

Recycle pre-consumer waste is more embrace than recycle post-consumer waste, which is
backed up by theory stating that pre-consumer waste is less complex to recycle than post-
consumer waste (Wright et al. 2011). UFTD is working with mills having a closed system and
selling all waste to recycling facilities. Filippa K is working with facilities that collect and sell
waste. Continuing with recycling within the value chain is thus vital, however it is of high
importance to developed the processes needed to recycle post-consumer waste. The main effort
is the sorting of fibres in order to be used as raw material for new products. Since the materials
have been going through change processes during production, one garment could consist of
many materials (Pui-Yan Ho & Choi 2012; Muthu et al. 2012a). The authors would like to
raise the attention towards the designers’ responsibility, which must take recyclability into
consideration.

In spite of the need for an infrastructure development and implementation of recycle in the
companies, some problematic aspects should be raised. Allwood et. al. (2006) is stating the
need to a further development in the processes of recycling due to the mix of fibres. Filippa K’s
collaboration with Re:Newcell will bring a solution to this if the technique is as cheap and
good in order to get commercialized. The use of mixed fibres (which will lead to higher quality
of the garment) will no longer be a problem. This means that one problem in design for
recyclability is eliminated and stronger incitements for a development of a reverse system is
created.

An important finding is that Filippa K and UFTD have different views regarding the use of
non-mixed fibres. UFTD are convinced that materials should not be mixed. Therefore UFTD
are using 100 percent of one fibre type to be able to recycle the garment. This view is in line
with the current theory, where mixed fibres are seen as the main barrier regarding recycling of
textiles (Muthu et al. 2012a). Due to upcoming recycle technology of mixed fibres, Filippa K is
convinced that mixed fibres still can be used in production. This will keep both the positive
benefits of being recyclable and having high quality, which results in longevity.

Due to Filippa Ks strong belief in the recycling technology systems for mixed fibres are about
to get commercialized, the authors consider this path to be the most beneficial. The garment
will both contain high quality and be recyclable. The case companies are dealing with the same
problems differently, where both of the case companies act upon their future belief. The
authors want to join Etsy and Winston (2006) by stating that a collective engagement embraced
by all apparel companies is needed in order for a faster change. Due to the complexity of the
apparel industry, with many parameters to take into account, collaborations are needed. The
authors suggest that open dialogues within the industry, regarding these types of questions are
needed. This will lead to exchange of knowledge, ideas and also joint decisions, which have
been embraced by UFTD.

Etsy and Winston (2006) also stress the need for other parties’ involvement. The government,
the industry, the researchers and logistics companies need to all collaborate to develop an
infrastructure system that will make the consumer put the garment back into the reuse and the
recycle loop. The planned practice that Filippa K is about to develop, where a consumer can
hand in the garment in the store, will be a first step in this order. The same goes for the bag
donation system at UFTD. The authors want to stress the need to give the consumer
incitements, due to the high disconnection between knowledge and actions. These incitements in turn should not urge the consumption habits. Instead the incentives should urge sustainable practices, such as giving a discount at the second hand store.

5.2 Modified model for a circular economy
In accordance with above analysis, the initial model has been modified as follows below:

- **Re-imagine** and **reduce** are activities embedded into the corporate strategy, culture and overall processes, therefore these are connected to all the points in the circular chain. Reduce focuses on reduction of waste with the aim to be totally eliminated in a circular economy. Re-imagine is about changing the mind-set of the business practices, which should be aligned with the sustainable logic. In accordance to the analysis, selling bi-products to the consumer in order to support a sustainable lifestyle in the user phase is added. Last, an inventory is added, due to the need for the model to become generally accepted. However, the aim is to have a small inventory as possible in order to reduce stock.
• **First user loop:** Within the first consumption loop, the aim is to maintaining the garment in the loop as long as possible. This means that the apparel companies must focus on quality and classical styles, as well as increasing the emotional attachment.

• **The reuse loop:** The inner post-consumption loop of the reverse strategies is reuse. This could be accomplished through either renting or redistributing the garments as second hand products.

• **The repair loop:** A repair service is added to the model, since this activity will not only maintain the garments in the consumption loop longer, but this is also an important connecting point with the consumer in order to create relationships. In accordance to above analysis, re-design is excluded, due to the inefficiency of the practice, the artistic view and non-commercial belief within the case companies.

• **The recycle loop:** The outer circle of the reverse strategies is recycling, where the garments are broken down into fibres and put back into the loop at the textile mills. An *infrastructure system* must be developed in order for the recycling loop to function. Donating the garment to a third party, where a person uses the garment in its original form, and later on it can be recycled could also be a possible step towards a circular economy.

• **Production recycle loop:** The stage within production where waste is recycled, i.e. pre-consumer waste.
6. Conclusion

In below chapter the research question are presented and answered. The circular economy model is defined in definite and the chapter finish by concluding the contributions and future research suggestions.

6.1 Purpose and Research Questions

By exploring current practices regarding circular economies in the apparel industry a framework have been constructed for integrating circular economy practices, which is summarized by answering the research questions:

- How can a Swedish apparel company develop their value chain towards a circular economy?
  - What are the main barriers for implementing a circular value chain?

6.2 Re-imagine

The first conclusion of re-imagine is the importance to think differently and challenge pathways and boundaries. This means that the current market dynamics and rules must change in order for sustainability to be the most important base of competition, which is identified as the main barrier within the re-imagine practice. Companies must connect the activities to the planet's eco system. By realising the consequences of activities the disconnection gap is filled, which is also needed in the consumer phase. To increase the lifetime of the garment in the first user loop it is vital to make garments with high quality and creating an emotional attachment.

It is also important to embrace new business opportunities in order to manage a business in a context with limited resources. In a context with limited resources, a recycle infrastructure system must be develop as well as other reverse value chain strategies. Due to the lack of concrete pathways and action plans found in UFTD, the authors conclude the need for an action plan that is embedded into the sustainability goals will increase the realism and credibility of the company’s vision. Last but not least, one important practice in order to reach a circular economy is to develop and sell bi-products supporting a sustainable lifestyle for the consumer.

6.3 Reduce

The authors suggest a lean production philosophy, where the waste of muda is minimized and eliminated, should be embraced in the apparel industry. The authors want to elaborate the lean philosophy by integrating it into all areas of the value chain, not only the production stage,
which also means aiming for a small inventory. In order to eliminate waste, a company should focus on finding supplier having a closed energy system, where waste is recycled or reused - wherever the highest value is gained.

Obviously, the most environmentally friendly mode of transport must be used, such as sea and road. By the use of local suppliers, the need for rush order by airfreight is eliminated. The collaboration needed with customer must be stressed, where the company should provide the tools needed in order to reduce in the consumer phase, such as clear washing instructions and by collaboration. The main barrier in the reduce phase is identified as being the stakeholder waste management. The need to collaborate over the boundaries is vital, however every involved party must possess a circular economy aim in order to reach the goal, which include the entire value chain - such as the consumer. Changing the stakeholders’ interests is a challenge.

### 6.4 Reuse

One goal within the first user phase is to maintain the garment in the loop as long as possible, which means that the company must offer high quality. In order to help the consumer take correct decision in line with a circular economy, the apparel company should add the estimated number of washes and the lifetime value of the product.

One of the biggest direct actions that should be taken in order to reach a circular value chain is to develop in-house second hand store and reverse systems connected to this. A rental library of the collection should be offered to the consumer, which will decrease the overall consumption. However, the main barrier that is connected to the reuse phase is the contemporary fast fashion consumption dynamics, which must be changed. New thoughts regarding consumption and ownership patterns must be brought to the consumers’ attention. The company must embrace incentives for the consumer to reuse clothing.

### 6.5 Repair

A repair service have been added to the initial model, which means that the company should offer repair services at the store and sell repair kits for home use. This will lead to both a longer product life cycle as well as increasing the closeness of the relationship. The main barrier in this area is the contemporary consumption habits. The companies must try to change the consumers’ perceptions about repairing clothes instead of consuming new.

### 6.6. Recycle

One of the most important practices in order to reach a circular economy is the recycle system. First of all, the company must recycle all pre- and post consumer waste. In order to do this, a infrastructure system for recycling must be developed. A convenient drop off system must also be developed, where the consumer can drop of the clothes (both for second hand and recycle).
In connection to the drop off system, sustainable incentives should be offered in order to increase the willingness of the consumer to use the system.

As the situation is now, the underdeveloped infrastructure system is the main barrier within the recycle phase. The initiative by Filippa K and Re:newcell is what the authors find as the most important aspect at the moment. Since this system allow the use of mixed fibres, the company will reach high quality of clothes (which mixed fibres result in) as well as the possibility to recycle the clothes. This means that both longevity and recyclability is reached. However, this technology-based machine must be able to be commercialized in order for the apparel industry to integrate it into their current value chain. Even if mixed fibres could be recycled in the future the problem with trimmings still exist. Another barrier for the apparel companies is regarding the sourcing of recycled materials.

A last reflection, due to current problems that is found in the research, especially with recycling, the most important act of an apparel company is to create garments that the customer can and especially want to use for a long time.

6.7 Contributions

By answering the research questions and fulfilling the purpose, below contributions have been made.

6.7.1 Scientific Contribution

The authors found that the already developed circular models were not as specific or creative as needed, in order to be applied in the apparel industry. In addition the focus has been put on the possibilities to develop circular economy practices. The scientific contribution is that the authors have adapted, develop and modified the introduced three models of circular economies, which aimed to fill the gap of specific curricular practices in the apparel industry. New theories have been developed that will lead to increased knowledge in the scientific community. A close connection is found to the textile management field, which makes the scientific contribution solid.

6.7.2 Societal Contribution

A contribution to the society is made due to the significance of sustainability in the society. By using this model and the introduced theory the society may lead to more engagement of the society stakeholders. By gaining knowledge in the sustainable development area may lead to development of regulations and incentives in the society. The knowledge can generate more convenient ways to hand in used clothes for the consumers.
6.7.3 Industrial Contribution

Due to the understanding of the limited planet resources and the increased importance of sustainable development in the industry, the authors have identified a need for a framework in order for apparel companies to embrace a circular economy practices. The circular model comprises the five R that have been identified as most important. Within a company, this model could be used at business strategic level as well as operational levels in order to develop a sustainable value chain for apparel goods. The model could contribute to an increased holistic thinking with the company, where the authors consider understanding is the basis for a change, in order to adapt to a business with the use of no resources. The model might need adaptations due to the various amounts of strategies that different apparel companies may have.

6.8 Future Research

In this research the focus was put on the value chain more than the product adjustment towards a circular economy. Therefore the first suggestion for future research suggestion is to conduct a benchmark of one piece of garment with mixed fibres (which result in higher quality and longer life cycle) with one piece of garment that is designed for recyclability, with the aim to conclude which of the garment is more environmentally friendly throughout the entire life cycle: the piece having a longer life but higher effort in the recycle process, or the piece with shorter life cycle but less energy in recycling.

Future research that could be valuable when implementing circular practices is the ownership structure within a circular economy, which may differ both for the producer and the consumer. Therefore there is a need to research about ownership models that might be more suitable for a circular value chain.

Last but not least, more research is needed in the constituents of the value chain that comes before productions, meaning growing the plants or the production in synthetics fibres, spinning and dyeing, since the focus of this research was based on the production and forward in the value chain.
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APPENDIX A: CIRCULAR ECONOMY BUSINESS MODELS

Model 2. The RSA model (The Great Recovery Report 2013)

APPENDIX B: INTERVIEW GUIDE UFTD

Swedish version

1. Vad är hållbarhet för er?
2. Vilka värden kännetecknar er?
3. Vad är viktigt för er i ert team?
4. Vad skiljer er från andra konventionella företag?
5. Vem är er kund?
6. Varför väljer er kund att köpa hos er?
7. Hur kommunicerar ni med era kunder?
8. Hur påverkar ni kunderna att använda plaggen mer hållbart?
9. Hur upplever du klimatet i företaget om du kommer med nya förslag?
10. Hur ser er design process ut?
11. Hur ser er sourcing/inköpsprocess ut?
12. Hur ser er värde kedja ut?
13. Vad gör ni med spillmaterialet som uppkommer under produktionen?
14. Jobbar ni med några verktyg för att utvärdera era produkters miljöeffekter? Vilka?
15. Vart befinner ni er just nu i ert miljöarbete?
16. Hur fungerar ert Collection library?
17. Varför ville ni starta ett samarbete med Stadsmissionen?
18. Finns de andra företag eller organisation som ni skulle vilja samarbeta med?
19. Vill få tillbaka plaggen så att ni kan re-design dem?
20. Vad är det som ligger till grund för ett nytt plagg eller kollektion?
21. De material som ni använder som är återvunnet, hur återvinns detta i tidigare led?
22. Fanns de svårigheter att hitta bra återvunna material?
23. Ser ni några begränsningar med den återvinnings-infrastruktur som finns idag?
24. Hur ser ni på framtiden?
25. År det något som begränsar er i dagsläget för att kunna utvecklas?
26. Vad ser ni för möjligheter?
27. Hur mycket resurser vill ni lägga ner på att bli världens mest hållbara varumärke?
28. Hur ser ni på lönsamhet i förhållande till hållbarhet?

English version

1. What does sustainability mean to you?
2. What values characterize the company?
3. What is important within the team of UFTD?
4. What differentiates UFTD from other conventional businesses?
5. Who is the customer UFTD?
6. Why does a customer choose to buy from your brand?
7. How are you communicating with the customers?
8. How do you influence customers to treat the garments more sustainable?
9. How do you perceive the climate in the company when you come with new ideas?
10. How does the design process look like?
11. How does the sourcing process look like?
12. How does the value chain look like?
13. What do you do with the waste material generated during production?
14. Do you work with any tools to evaluate your product's environmental impact? Which?
15. As of today, in what state is UFTD the sustainability work?
16. How does the Collection library work?
17. Why did you start with the partnership with “Stadsmissionen”?
18. Are there any other company or organization that you would like to collaborate with?
19. Do you want to get the garments back, in order to re-design them?
20. What is the basis for a new garment or collection?
21. The recycled materials you use, how is that recycled?
22. Are there any difficulties finding good recycled materials?
23. Do you see any limitations with the current recycling infrastructure?
24. Please tell us about the future?
25. Is there anything that limits the current situation to develop?
26. What opportunities do you find?
27. How much resources are you willing to invest in order to become the most sustainable brand?
28. How do you relate profit to sustainability?
APPENDIX C: INTERVIEW GUIDE FILIPPA K

Swedish version

1. Vad är hållbarhet för er?
2. Hur påverkar ni kunderna att använda plaggen mer hållbart?
3. Hur ser er framtida värde kedja ut?
4. När flyttade ni produktionen till Portugal? Varför?
5. Vilka förändringar krävs för att ni ska kunna vara i kontroll av er supply chain år 2030?
6. Varför släpper ni fyra kollektioner per år?
7. Vad ligger till grund för designen?
8. Ni har ett lager i Borås - är detta något ni planerar förändra?
9. Hur arbetar era leverantörer med spill?
10. Berätta om varför ni utvecklade tvättmedlet?
11. Ni samarbetar med lånegarderoben - är detta något som ni vill implementera i er organisation? Varför? hur?
12. Berätta om er second hand shop? Hur kan denna utvecklas?
13. Ett annat exempel är att ha en re-design avdelning, är det något som diskuterats på Filippa K? Varför tror du att detta skulle/skulle inte fungera?
14. Är det något som begränsar er i dagsläget för att kunna utvecklas?
15. Vad ser ni för möjligheter?
16. Hur långt har ni kvar till att nå en cirkulär ekonomi?
17. Hur ser du på hållbarhet i förhållande till vinst?’

English version

1. What does sustainability mean to you?
2. How do you influence the customers to use garments more sustainable?
3. How does your future value chain look like for Filippa K?
4. When did you move the production to Portugal? Why?
5. What changes are necessary in order to be in control of the supply chain in 2030?
6. Why are you releasing four collections per year?
7. What is the basis for your design?
8. You have a distribution center in Borås - Is this something you plan to change?
9. How do your suppliers work with waste?
10. Please tell us why you developed the washing soap?
11. The collaboration with "Lånegarderoben" - is this something that you want to implement in your organization? Why? How?
12. Please tell us about your second hand shop? Can this idea be developed in any way?
13. Another example is to have a re-design department, is that something that have been discussed at Filippa K? Why do you think this would / would not work?
14. Is there anything that limits the current situation to develop?
15. What opportunities do you find?
16. How far if Filippa K from reaching a circular economy?
17. How do you relate profit to sustainability?
APPENDIX D: INTERVIEW GUIDE STUDIO RE:DESIGN

Swedish version

1. Berätta om Studio Re:Design?
2. Vad är re-design?
   a. Hur gick det för de sex designerna som var med i projektet?
   b. Säljer de idag kommersiella produkter?
3. Vilka möjligheter medför re-design?
4. Hur ska ett sådant logistik system kunna se ut?
5. Vilka svårigheter finns med konceptet re-design?
6. Hur ser en (re)design process ut?
7. Hur ser du på att kunna göra re-design kommersiellt?
8. Vilken respons har ni fått av företagen som deltog i projektet?
9. Hur ser du på framtiden för konceptet re-design?

English version

1. Please tell us about Studio Re:Design?
2. What is re-design?
   a. What happened to the six designers who were involved in the project?
   b. Are they selling commercial products today?
3. What opportunities are created by re-design?
4. How can such a logistics system look like?
5. What difficulties do you find with the concept of re-design?
6. How does a (re) design process look like?
7. What are your thoughts about commercialising re-design?
8. What response have you received from the companies that participated in the project?
9. How do you see the future for the concept of re-design?
Flight of Imagination AB was founded in 2005 in the city of Stockholm, as a private held company by a collective of men, but developed a couple of years earlier. Putting fashion, music and art together; the company provide menswear fashion for “the progressive men of the world”, under the brand label Uniforms for the Dedicated (UFTD). They operate mostly in Europe, with the flagship store in Stockholm and sell the collections at approximately 150 independent retailers. With their eight employees, UFTD aim to make a change (About Uniforms for the Dedicated 2014).

What differ Flight of Imagination from conventional companies is the motivation towards a better and more sustainable world. They want to inspire, provoke and change how the industry works and to do better in order to contribute to a more sustainable planet, together with suppliers, consumers and other brands. UFTD want to aspire that sustainability and financial gains can go hand in hand. With this high ambition, UFTD aims to pushing the boundaries and to leave a mark, which they integrate into every piece in the collection (About Uniforms for the Dedicated 2014).

The company has realized the need for change. UFTD do not consider it to be a choice any longer, rather that it is something everyone own to themselves, and to the future generation of the living planet. Furthermore, UFTD express the need to find a purpose and meaning to the lives we live, where they aim to matter as entrepreneurs. They put this into action with the clothes they provide. One of their missions is to share the knowledge by embracing inspiration gained from other industries and putting this into fashion, as well as passing this knowledge on to others such as retailers. This is one way to develop towards a sustainable future, continue to pushing boundaries and by that going beyond sustainability in order to leave a positive impact on the environment (Change 2014).

UFTD strive towards reaching a design that is elegant, classic, time-less, with elements of surprise. They are adding a modern expression to a classic piece, by the right choice of design, details, materials as well as silhouettes. UFTD put effort into the design in terms of comfortability, so the consumer wants to wear a piece all the time. UFTD deliver three promises: high quality, ethical and environmental values and last the aim to become even better. The company states that they design clothes for the dedicated man, that is elegant and confident. Trend is not as important as looking and feeling good; therefore he makes conscious decisions that in compliance with his core values. This man is demanding and educated, that UFTD listen to and is inspired by (Design Philosophy 2014).
APPENDIX F: COMPANY PRESENTATION FILIPPA K

Filippa K Group AB was founded in 1993 and is now operating in 20 markets through their 36 stores, and through 740 independent retailers. The company aim to sell commercial, yet timeless fashion with high quality at an affordable price, for both men and women. The core values of Filippa K are “Style, Simplicity and Quality”, which impregnate all activities they do. The annual turnover 2012 was 571 million SEK and the company employ over 200 people (Filippa K 2012a). Filippa K was awarded the prestigious award “Guldknappen” in 2010, as well as many other prices for their work in the fashion industry. The company vision is to:

Our vision is to make everyday life easier for the modern woman and man, by interpreting fashion trends into wearable, timeless style solutions that are long-lasting both in quality and design (Filippa K 2012a, p.3).

Filippa K - Sustainability Goals 2030
(Presented in Filippa K sustainability report 2012).

Environment
Filippa K wants to minimize our environmental impact by continually improve products quality, by decreasing the products environmental impacts and prolong the product’s life.

- Offer 100% sustainable products
- 100% sustainable materials (class 1-2)
- 100% sustainable production (FK definition) Not contribute to over consumption
- 100% purchase precision in number of pieces produced
- Offer each product at least six months of exposure in stores Prolong the life cycle of our product
- Average life length of our products at least 4 years
- Offer all products a second life

Partners
Filippa K is determined to raise the level of partners' sustainability efforts by working in partnership with a focus on communication and long-term relationship.

- Be in control of our supply chain
- 100% transparency in supply chains
- 100% compliance to Filippa K CoC

Employees
Filippa K wants to be a responsible employer who empowers its employees and encourages initiative taking as well as a balanced lifestyle. The overall target is to have employees that are proud of the company and the work we do.

- Employee Satisfaction Index (ESI) >80%
- Absenteeism <3%
- Proud employees (ESI) >85%
Business
Filippa K wants to grow with care together with our partners.
- Sustain profit level of more than 10% EBT
- Sustain growth in comparable unit
- Employee approval of shared responsibility at (ESI) 80%
- 100% approval of us as a partner (Filippa K 2012a)
APPENDIX G: COMPANY PRESENTATION STUDIO RE:DESIGN

Studio Re-design was founded in 2012, with the purpose of decrease the environmental stress, creating new business opportunities and to explore new design processes for reuse (Studio Re:Design 2013). Furthermore, Studio Re:Design aim to create employment opportunities through good environmental and social solutions and to support textile companies to continue doing business in a sustainable direction. They started off by doing research about what textile companies could do with textile waste that was occurring during the production phase. Currently, they are focusing on handling textile materials from the Red Cross and create new product through re-design (Jansson 2014). Studio re-design collaborate with Swedish companies in order to take their textile waste material and generate something new and creative (Studio Re:Design 2013).