TEXTILE WASTE IS ONLY MATTER OUT OF PLACE
– ANTECEDENTS OF VALUE CREATION IN REVERSE TEXTILE VALUE CHAINS

Thesis – Master
Textile Management
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Year: 2015 Thesis id number: 2015.16.03
Textile waste is only matter out of place - antecedents of value creation in reverse textile value chains

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2015

Acknowledgements

The textile industry is facing a new emerging mind-set, with increasing awareness and appreciation of the resources already available today. In this new mind-set, reuse and redesign are growing fields of interest, and ways of doing business. The importance of research in this area became apparent when contacting companies and organisations. The invitation to participate in the study received a high response rate and positive attitudes towards the subject: “I have worked with second hand clothing for over ten years. Finally research is starting on this topic!” The authors want to thank all of the respondents for participating in the study, and giving thorough and inspiring interviews: Boomerang, Design Stories, Emmaus Björkå, Haglöfs, Human Bridge, Mocklis, Myrorna, the Swedish Red Cross, Skryta, and Uniforms for the Dedicated.

The authors would also like to thank Rudrajeet Pal for supervision and guidance, David Eriksson for his support, and the opponents for their meaningful feedback.

Borås 2015-06-09

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Abstract

**Background:** The current waste management system of Post Consumer Textile Waste (PCTW) in Sweden leads to vast amounts of incinerated or exported textiles. The amount of PCTW reused or repurposed within the country is small in comparison to the amounts of textile products consumed every year. Hence, there is an observed problem in terms of low value creation from textile waste. A system that allows for more textiles to be kept and reused in Sweden could create more economic value in a resource-efficient way.

**Purpose:** The purpose of this thesis is to investigate value creation from Post Consumer Textile Waste for reuse and redesign in Sweden, and to establish a framework for the antecedents of value creation in reverse textile value chains.

**Methodology:** A pre-study was conducted to map the PCTW industry structure, and served as the basis for sampling cases. Data collection consisted of multiple case studies from 4 charity organisations, 3 clothing brands and 3 redesign brands. The interviews were performed in a semi-structured manner in order to discover the state-of-art in value creation and to identify the key enabling attributes. The findings were analysed to adjust the deductive framework to the textile industry context.

**Results & findings:** The state-of-art for value creation among the selected cases varies depending on its mission. Charity organisations are facing a new competition of resources from clothing brands, who have realised a potential of new differentiation by engaging in value creation from PCTW. This has led to a new mind-set among the charity organisations to work more strategically in all their activities. Redesign brands are a relatively new actor and want to work symbolically with redesign to communicate the values in textile materials. Enablers and disablers to value creation from PCTW were found in the interviews and lead to the development of an empirical framework.

**Conclusion:** This thesis provides rich descriptions of the current preconditions and challenges within the field. Furthermore, it presents a framework for the antecedents of value creation along the recovery processes involved in reuse and redesign value chain. The empirical framework confirms the themes in the theoretical framework, and concludes that there is a set of generic antecedents for value creation in reverse textile value chains. However, there are also category specific antecedents, which need to be considered. The specific experiences of one actor category might as well be valuable learning for another, which is why increased collaboration is suggested to enhance value creation from PCTW.

**Keywords:** Post Consumer Textile Waste (PCTW), Textile Waste Management, Value Creation, Reverse Logistics, Recovery Processes
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1. Introduction
This chapter provides a background to the issues regarding textile waste as a consequence of increased consumption and disposal, and the system in place to manage it. The problem discussion elaborates on these issues from a perspective of value creation, leading into the identification of a research gap. Consequently, the purpose and research questions are presented followed by the delimitations set for the study.

1.1 Background
Textile products are associated with major environmental impacts in all stages of the lifecycle, from production to use and end-of-life management (Tojo et al. 2012). Traditionally, there is a view of production and consumption as linear, in which disposal is perceived as the end of the lifecycle (World Economic Forum 2014). Accordingly, much attention in research and practice has been put to sustainable production of virgin fibres. However, as natural resources become scarce and prices increase the focus will need to shift to recycling and reuse of existing resources (Svensson 2007; Kumar & Putnam 2008). In Sweden, the consumption of textiles has increased by 40% over the last ten years, resulting in greater amounts of waste (Naturvårdverket 2013). This further necessitates the consideration of waste as a resource. Hence, research on new procedures to handle the growing masses of textile waste is becoming urgent.

The yearly consumption of textiles in Sweden is estimated to 12.5 kg/ person. From this, 8 kg are disposed in the general waste stream as household waste, and are incinerated. 2.4 kg of post consumer textiles are donated to collecting organisations, from which only 0.9 kg are reused within the Swedish borders, while the rest is exported (Naturvårdsverket 2013). Current lifestyles and consumption patterns are the underlying problems (Ekström & Salomonsson 2014; Niinimäki & Hassi 2010). However, the growing amount of textile waste has also highlighted problems in the current waste management system regarding the large-scale incineration of textiles (Ekström & Salomonsson 2012; Elander et al. 2014; Niinimäki & Hassi 2010; Carlsson et al. 2011, Naturvårdsverket 2013). This constitutes an environmental issue in terms of lost material value, which could have been reused, and in later loops recycled (Ekström & Salomonsson 2012).

Three key criteria have been identified in order to reduce the amounts of textiles in final waste disposal: i) reduced consumption of new textiles, ii) prolonged lifespan of existing textile products, and iii) reuse and recycling of textiles that no longer fit for its first intended use (Tojo et al. 2012). In accordance with these criteria, the Swedish Environmental Protection Agency and the Swedish Chemicals Agency have developed milestones for the textile industry. One of the most salient milestones states that by year 2020, 40 % of all textiles put on the market should be reused. To achieve this, existing collection systems need to be developed to ensure the reuse rate by 2018 (Naturvårdsverket 2013). Furthermore, a Nordic Textile Commitment initiated by the Nordic Council of Ministers aim to:
engage stakeholders in committing to common goals of reducing the environmental impact from textile consumption and increasing the competitiveness of the Nordic region. It provides a third party certified system for legitimate sustainable collection, sorting, reuse and recycling of textiles by the participating actors.

(Palm et al. 2015, p. 7)

One way of approaching the misplacement of waste is through producer responsibility. Product groups such as packaging, newsprint and batteries have been legislated with producer responsibility in Sweden, in accordance with the European Union waste directives. However, this does not exist for textiles, and currently only 20% of textiles put on the market are collected in channels that promote reuse and recycling (Palm 2011; Palm et al. 2014). Examples from where producer responsibility has been implemented for textiles show clear increase in collection and reuse rates (Tekie et al. 2013; Naturvårdsverket 2013). The absence of legislation for textile waste necessitates the identification of other enablers of value creation, through recovery processes by individual actors.

Charity organisations are the main actors in promoting reuse in Sweden. However, clothing brands are increasingly taking part in the collection as an extension of their corporate social responsibility (Palm et al. 2014). These take-back programs have mainly taken place in cooperation with commercial or charitable partner organisations. In recent years, some clothing brands have also started to sell reused clothing and experimenting with textile waste through redesign of unsold goods or production waste (Ekström & Salomonsson 2012). There are also initiatives taken by some clothing brands aiming to prevent waste through repair (Ekström & Salomonsson 2012). Furthermore, renting services and new ownership models such as clothing libraries are emerging (Watson et al. 2014). Moreover, a comprehensive experiment to make new products from post consumer textiles was performed in Studio Re:design. Re:Textile is a continuation of the project, and aims to industrialise the redesign process and thereby create a commercial chain for Post Consumer Textile Waste (PCTW) (VGR 2013). These diverse initiatives illustrate a transition of the conventional textile industry, away from the mind-set of textile production and consumption as linear.

1.2 Problem discussion
The current pace of textile consumption and disposal has clearly stated the faults of the textile waste management system in terms of resource efficiency. The present structure, with large-scale incineration and export, constitutes a loss of value in Sweden as materials could have been sold for reuse and in later loop recycled (Ekström & Salomonsson 2012). To turn the negative trend, a system needs to be built around the appreciation of textile waste as a valuable resource. This requires logistics that divert textiles from the general waste stream and that enable a larger amount of used textiles to be kept for value creation inside Sweden.

‘Value’ can be defined as “the material or monetary worth of something”\(^1\). In business management, value is created through “the performance of actions that increase the worth of

\(^1\) Oxford Dictionaries (2015)
goods, services or even a business.”2 The current business discourse often refers to the stakeholder view, which holds companies responsible to create value to a broad spectrum of stakeholders, also including society and the environment (Mathur & Kenyon 1997). Reverse value chain strategies answer to these responsibilities by making use of waste as a resource for new product development. A requirement for this is effective reverse logistics, which consists of collection strategies as well as recovery processes such as sorting, cleaning and mending or reuse of the material (Van Hillegersberg et al. 2001). In this perspective, value creation is defined as creating economic value in a resource efficient way, and by that also contributing to environmental value.

The observed problems of low value creation have been suggested as results of a fragmented system with low levels of strategic collaboration (Ekström & Salomonsson 2012). The field of reuse and recycling of PCTW in Sweden is still to a large extent unexplored and unregulated, and voluntary initiatives are based solely on the interest of individual actors (Naturvårdsverket 2013). The lack of legislation and regulation is proposed another reason for the fragmentation, leading to confusion regarding the ownership of textile waste (Naturvårdsverket 2013; Palm 2011). Furthermore, collection of PCTW is performed by several actors through multiple channels, but few engage in sorting activities. This responsibility lies solely on charity organisations that are forced to handle increasing masses of textiles not suitable for their operations (Palm 2011; Ekström & Salomonsson 2014).

To recover and create more value from the amounts of textile waste, other recovery processes need to be considered as additions to the traditional second hand retailing. Redesign is a way of producing that could make use of the amounts of PCTW available. All production resources needed for a redesign value chain from PCTW have been suggested to exist within the region of Västra Götaland. However, the crucial capacity of a collective sorting facility to provide the material is missing (Carlsson et al. 2014). Further difficulties were presented from Studio Re:design, comprising of the trouble to achieving profitability in these value chains. The logistics operation from collection to new design was identified as the greatest obstacle by the participants (VGR 2014). For these reasons, redesign does take place but is not common practice with any of the collecting actors, commercial or charitable (Ekström & Salomonsson 2012).

The identified lack of formal and strategic structure towards the handling of PCTW leads to the majority of disposed consumer textiles being incinerated or exported for commercial use in developing countries, with questioned impacts (Brooks 2012; Palm et al. 2014; Tojo et al. 2012). Enhanced value creation within Sweden would therefore mean increased responsibility both locally and globally, as well as providing economic gains to the participating actors. This evokes the question of what is required to create value from PCTW in the different recovery processes locally.

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1.3 Research gap
Research on supply chain management has to a large extent concerned forward value chains and business models based on new products from virgin materials (Svensson 2007). Examples from other industries have shown economic and ecological gains from working with reverse logistics (Jayaraman & Luo 2007). However, the effect of value creation and reverse logistics in textile value chains combined is not well stated. There is a lack of extensive mapping in this field in terms of value creation and actors involved. Hence, this thesis makes a clear contribution. Successful reverse value chains, creating value towards a spectrum of stakeholders, will have an increasingly important role in the future (Svensson 2007; Kumar & Putnam 2008). Thus, a framework of antecedents for value creation in reverse textile value chains based on theory and practice is of relevance.

1.4 Purpose and research questions
The purpose of this thesis is to investigate value creation from Post-Consumer Textile Waste (PCTW) for reuse and redesign in Sweden, and to establish a framework for the antecedents of value creation in reverse textile value chains.

This leads to the following research questions:
RQ1: What is the state of art for value creation in the identified network managing PCTW in Sweden?
RQ2: What are the key enabling attributes of value creation along the recovery processes in a reuse and redesign value chain of PCTW?

1.5 Delimitations
The thesis is limited to value creating activities performed by actors in the identified network managing PCTW in Sweden, rather than the types and levels of value that is being created. These are activities such as collection, sorting, and further reuse or redesign. Hence, down cycling and fibre recycling are not treated as they are considered less resource efficient in accordance with the EU Waste Directives (Ekström & Salomonsson 2012). Further, the thesis is limited to wearable textiles disposed from private consumers. In this context, PCTW is defined as textiles that has lost their use-value to the consumer, and are not considered to hold exchange-value
2. Literature review: towards developing the theoretical framework

The literature review combines three areas of research for the development of the theoretical framework. First value creation is introduced, followed by a chapter on reverse logistics. After, the two areas of research are connected to each other. Furthermore, the recovery processes associated with a reverse value chain are discussed. Insights are combined in a theoretical framework of the antecedents for value creation in reverse value chains. Research is derived from different industries with respect to the identified research gap.

2.1 Value creation

2.1. Framing value creation

Value creation is the main objective of a business and has been extensively discussed in economic and strategic research from many perspectives (Amit & Zott 2001). The Resource Based View (RBV) of the firm is a widely used theory, focusing on the development and protection of valuable resources in firms to achieve economic profit (Bowman & Ambrosini 2000). It builds on the notion of the firm as a combination of resources, which may lead to value creation if the firm succeeds in uniquely combining available resources and capabilities with good fit (Amit & Zott 2001). The identification of internal resources that generate value, and consequently what resources to outsource, is an important core competence of a firm (Fine 1998).

Definitions of value in business research are often built on Porter’s seminal work on the value chain model (Amit & Zott 2001; Brandenburger & Stuart 1996; Bowman & Ambrosini 2000). Porter’s value chain model identifies value creation by activities at the firm level, and considers the economic implications of activities. This means which activities should be performed, and how the firm’s activities should be configured to enable the firm to add value to a product and be competitive (Amit & Zott 2001). Primary activities, which have a direct impact on value creation, are the creation of physical products including inbound- and outbound logistics operations, marketing and sales, as well as service (Porter 1985). Brandenburger and Stuart (1996) extend the perspective of the value chain to include activities performed by both suppliers and buyers, equally engaged in the value creation. Hence, the value chain as a whole creates value. Yet another level is the value network, which is a system of related value chains. It consists of a “collection of interdependent firms that contribute to the creation of holistic value by producing components and subsystems that come together to form a holistic technological system.”. The value network perspective is built on specialisation of core competencies and the dynamic capabilities of firms to integrate with others (Garza & Dedehayir 2012).

2.1.2 How value is created and measured

Value is created through the transactions and exchanges between network partners (Garza & Dedehayir 2012). The value creation process is based on a firm's acquisition of resources such as capital, labour, and raw materials from suppliers, which are transformed into products and
services to be sold to the firm’s customers (Brandenburger & Stuart 1996; Bowman & Ambrosini 2000; Brooks 2012). Hence, labour processes are the source of value. Brandenburger and Stuart (1996) and Porter (1985) define the value created as:

\[
\text{Value created} = \text{willingness-to-pay} - \text{opportunity cost}
\]

Willingness-to-pay is based on the amount of money that can be taken from the buyer in exchange for the product, without dissatisfying the buyer. Opportunity cost is defined as the opposite, constituting the accepted cost from the supplier, for the firm to acquire a set of desired resources (Brandenburger & Stuart 1996). Hence, value created is measured by total revenue (Porter 1985). Accordingly, profit is the proportion of value captured by the firm through the combination of labour and other resources (Bowman & Ambrosini 2000).

Value created might also denote value in terms of other stakeholders than the firm and its shareholders, with the purpose of rethinking the discourse of value creation and trade (Mathur & Kenyon 1997; Freeman 2010). The value created by firms might yield economic return to shareholders through profits as well as to stakeholders such as workers, and to society through taxations (Davis & Kay 1990). However, the environment is increasingly seen as an important stakeholder, towards which the firm must also create ecological value (Mathur & Kenyon 1997). Stakeholders are inherently tied together and cannot be ignored in risk of affecting the business. Hence, the objective of management is to create as much value and beneficial trade-offs for all stakeholders as possible by pursuing the firm’s purpose (Freeman 2010). In line with this perspective on value creation, Watson et al. (2014) uses both qualitative and quantitative measures of value when assessing business models. These are economic, environmental and social indicators.

In Marxist economic theory, value takes the form of use-value and exchange-value (Bowman & Ambrosini 2000). Figure 1 illustrates the process of how both values are created. Similar to the concept of willingness-to-pay, use-value is described as the subjective assessment of the usefulness of a product related to the cost in the eyes of a buyer. Exchange-value refers to price, which is the monetary value realised by the seller of a product only at the point of sale or exchange. Thus, at the point of sale, a product has both use-value and exchange-value (Bowman & Ambrosini 2000). Moran and Ghoshal (1999) define value creation accordingly, as “an iterative process of creating and realising value through resource combinations and exchanges”.

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In accordance with these arguments, firm profits can be attributed to the labour practices assigned to transform resources (acquired use-values) into new use-values. Hence, profits may differ among firms due to differences in conduct (Bowman & Ambrosini 2000). Differential labour is the unique resource of a firm that contributes to superior profits, such as the special talent of a designer or a unique way of selling. Generic labour is described as homogenic across firms. It contributes to the creation of new use-values but does not provide profit differentials among competing firms (Bowman & Ambrosini 2000). It is the intangible resources of a firm that provide competitive advantage, which generate the added value (Davis & Kay 1990). As seen in Figure 1, production processes create use-values, which may contribute to added exchange-value that is realised as the use-values are sold (Bowman & Ambrosini 2000). Added value is the amount by which the value of corporate output exceeds the value of all used inputs, including material, capital and labours. Therefore, added value can be used as a measure of competitive advantage (Davis & Kay 1990). Accordingly, profit is achieved as the realised exchange-value exceeds the costs of resource inputs, including wage costs.

### 2.1.3 Strategies for value creation

To be able to sell to a price that provides added exchange-value, competitive advantage is required (Brandenburger & Stuart 1996; Mathur & Kenyon 1997; Bowman & Ambrosini 2000). Differentiation in every step of the value chain is the means for competitive advantage (Porter 1985; MacMillan & McGrath 1997) and increases the buyer’s willingness-to-pay by meeting the buyer’s needs in better ways (Brandenburger & Stuart 1996; Porter 1985). Differentiation can be achieved at any point in time where the customer has an experience related to the firm or its products, from realisation of need to disposal at the end-of-life. However, this requires market orientation (MacMillan & McGrath 1997; Cambra-Fierro et al. 2011). The end of the lifecycle is an important point of differentiation through return policies, repair services as well as offering proper disposal options (MacMillan and McGrath 1997). Drivers of differentiation include; policy choices (what activities to perform and how), linkages (within the value chain or with suppliers and channels), timing (of activities), location, sharing of activities among business units, and learning and integration (Porter 1985). Further, focused creativity through analysis of consumer interactions is an important success factor to identify strategies for differentiation (MacMillan & McGrath 1997).
Supplier relationship management is another important part of creating value, by lowering suppliers’ opportunity costs (Brandenburger & Stuart 1996). Successful integration of a supplier that possesses the right capabilities, especially knowledge about the product and process, enhance the effectiveness and product development success. Further, involvement into the technical goals related to the product design leads to positive results. However, coordination is needed to integrate buyers and suppliers, and lack of coordination often leads to problems (Petersen et al. 2005; Garza & Dedehayir 2012). The more complex the product development process is, the higher the level of cooperation is needed. Joint multi-functional development teams can share expertise and identify improvements through a collaborative product- and business process. Conditions for a successful collaboration include exchange of expertise and a trustful relationship between the parties (Möller 2006). Value creation taking place within a system of actors may also involve collaboration with competitors and research institutions among others. The level of innovation drives the development of infrastructure; hence a higher level of innovation involves more actors, and requires higher levels of network collaboration and competences (Lundgren 1995 in Möller 2006, p. 921).

Furthermore, efficient value networks are dependent on key actors who coordinate materials, information and finance, as well as having authority to influence solutions to customer demands. Network complexity leads to reduced resource allocation capabilities, efficiency loss and problems in coordinating resource flows in the network. External factors might also influence the possibilities of network development. Examples include policy development by governmental agencies or other institutions, changing demographics and customer demands, and technological innovations in other value networks (Garza & Dedehayir 2012).

2.2 Reverse logistics
The first order value chain follows the traditional practices of Supply Chain Management, while the second order value chain represents a chain of reuse or recycling. Furthermore, the second value chain can be followed by one dedicated to either waste disposal or a re-entering into the market (Svensson 2007). In such reverse value chains, the consumer is considered the first link in the channel of distribution rather than the last. This necessitates the perspective of the consumer as a supplier (Zikmund & Stanton 1971; Krikke et al. 2004; Östlin et al. 2008). The reverse value chain constitutes an updated perception of a value chain from the unidirectional to a closed-loop system, and is increasingly considered a key competence within Supply Chain Management (Jayaraman & Luo 2007). Reverse logistics is defined as:

The process of planning, implementing, and controlling the efficient, cost effective flow of raw materials, in-process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing value or proper disposal [...] Remanufacturing and refurbishing activities also may be included in the definition of reverse logistics.

(Rogers & Tibben-Lembke 1998, p. 2)

The reverse value chain strategy, incorporating all activities related to the return of products including suppliers and other actors participating in the process, is the primary source for
competitive advantage. Reverse value chain strategies are difficult to imitate due to the complex network of actors and unique processes specific to a certain product and firm (Jayaraman & Luo 2007). Further, profitability is gained when the value of returned products is maximized and thus the reverse value chain strategy operates efficiently (Fleischmann et al. 2004; Jayaraman & Luo 2007). Reverse logistics allow value to be recaptured from disassembled products, for assets to be recovered as well as costs to be reduced (Ellram et al. 2008; Jayaraman & Luo 2007; Jack et al. 2009). Recovering products are considered to have lower environmental impacts than manufacturing from virgin materials, as well as being energy-saving and less material consuming (Chen & Chang 2011). An efficient system may lead to improved customer service levels and customer loyalty as a result of environmental-and social responsibility (Ellram et. al 2008; Jayaraman & Luo 2007). Intangible values created by this system include improved image towards suppliers and customers, and corporate citizenship (Jayaraman & Luo 2007).

Customer and supplier relationships are further important factors for the reverse logistics performance to acquire used products and manage the irregular flows (Östlin et al. 2008). The main distinction between forward and reverse logistics is the network design. The former consists of separate structures between production and distribution and the latter encompasses both separate and connecting links in a highly complex structure (Fleischmann et al. 2004). By considering network design when planning for reverse logistics, great benefits in terms of reduced costs and use of new resources can be achieved (Ellram et al. 2008). However, this complexity may also give rise to issues concerning strategy and logistics operations (Jayaraman & Luo 2007). The various processes involved in the reverse logistics rely on the logistics architecture, how products are collected, separated, remanufactured and later distributed to customers (Rogers & Tibben-Lembke 1998; Fleischmann et al. 2004). Depending on where the products are collected, from the consumer or another member of the value chain, the reverse logistics system is planned accordingly. Hence, this is an important factor determining the reverse logistics activities (Rogers & Tibben-Lembke 1998).

There are two main problems in the reverse logistics process. The first one is the difficulties in predicting the amount and quality of returned products. The second issue is related to the collection- and transportation process, more specifically how to control and plan inventory and production (Jayaraman & Luo 2007). To handle these problems, expertise and specialisation is required as well as cooperation with suppliers holding the right capabilities for managing the complexity of the system (Kumar & Putnam 2008). Collaboration may enhance predictability in the supply chain, which in turn leads to improve planning capabilities (Abraham 2011). Successful companies working with reverse logistic operations identify integration with other actors in the value chain as an important factor to make the operations profitable (Jayaraman & Luo 2007). Further, coordination between the different actors involved in the reverse value chain is a critical task, which directly affects the efficiency of the whole system (Blumberg 1999; Debo et al. 2004). A key factor related to coordination in the reverse logistics system, is the flow of information between the network actors to enable efficient planning of returned products with regards to timing and quality (Kumar & Putnam 2008; Debo et al. 2004).
2.3 Value creation through reverse logistics

Traditional Supply Chain Management is limited to an established point of origin and end boundaries. However, there is need to consider the extension into second, third and n-order supply chains, integrated with the first one. This way of thinking about supply chains allows for repeated points of origin and consumption, based on the same resources. In such a system, the point of consumption represents the point of origin in the next loop (Svensson 2007), as seen in Figure 2. This is the starting point for the reverse logistics operation, and hence value creation process in the reverse value chain.

Figure 2. First- and n-order supply chains (Svensson 2007, p. 264)

In order to prolong the product lifecycle into multiple cycles, product and further process design needs to be planned simultaneously (Umeda et al. 2012). This also needs to be supported by design guidelines and tools for decision-making (Go et al. 2015; Umeda et al. 2012). The product design decisions taken in the first design stage naturally determines the conditions for further product lifecycles. At present, multiple generation product lifecycles is a relatively new research area and has not gained much attention in world economics (Go et al. 2015). The reverse value chain means added complexity in planning due to the uncertainty of volumes and quality surrounding reverse logistics operations (Jayaraman & Luo 2007). However, it is also a new source of differentiation for firms as suggested by MacMillan and McGrath (1997). It requires a new way of thinking about resource allocation and planning operations where the consumer has the role as the raw material supplier (Zikmund & Stanton 1971; Krikke et al. 2004; Östlin et al. 2008). Due to their role as main collectors of PCTW (Tojo et al. 2012), charity organisations could be seen as the new points of origin in reverse value chains (Svensson 2007).

During a product’s life cycle, the value changes depending on design, quality, usefulness, maintenance and how it is perceived by others. This value assessment determines the further destinations of a used product, whether it is recovered or disposed (Umeda et al. 2012). In accordance with the Marxist economic theory, value creation through reverse logistics is based on the acquisition and transformation of post-consumer products. Through labour activities new use-values are created, giving the product a second lifecycle (Brooks 2012). The disposal or donation of used clothing, which have lost its use-value to the first owner, demonstrates a perceived lack of exchange-value in the garments. However, most often these disposed garments still contain use-value based on their physical properties, but this becomes latent in the disposal process. Garments that are perceived to hold exchange-value are instead
directly redistributed to the market by the consumer and do not need to go through any reproduction processes (Brooks 2012).

The realisation of latent use-values is the basis for value creation in reverse value chains, by activities that add value to the ingoing material. This is performed through collection, sorting, and redistribution of used garments (Brooks 2012), thus representing the most fundamental forms of value creation of second-hand clothing. Once a disposed garment has passed through these and possibly further steps of labour practices, it has re-entered the commodity form and thus regained potential exchange-value (Brooks 2012). Hence, it can be sold as a reused or redesigned product. At the point-of-sale, the value added by the recovery processes is realised as the monetary exchange-value of the product.

In summary, reverse logistics enable value creation in a closed-loop system by reclaiming the value from the returned products (Fleischmann et al. 2004; Kumar & Putnam 2008; Ellram et al. 2008; Jayaraman & Luo 2007). Figure 3 visualises the return flow and recovery processes in a reverse logistics value chain.

**Figure 3.** Reuse, remanufacturing and recycling reverse logistics (Kumar & Putnam 2008, p. 314)

### 2.4 Recovery processes

Product Recovery Management (PRM) is defined as the management of all used and disposed products, components as well as materials, in the responsibility of a manufacturing company (Thierry et al. 1995). However, the different processes related to PRM and the realisation of latent use-values is also applicable when the responsibility is not put on the manufacturer. Product recovery aims at reducing waste by recovering as much as possible of the economic and ecological value from used products (Thierry et al. 1995; Östlin et al. 2008). In addition, product recovery is motivated by increased profitability, ethical responsibility, legislation, increased market share and brand protection (Seitz & Peattie 2004 in Östlin et al. 2008, p.337).

Activities such as repair, refurbishing, remanufacturing, cannibalization and recycling are classified as recovery options, listed in order of required degree of disassembly. However, only repair, refurbishing and remanufacturing are considered ‘upgrade’ processes (Thierry et al. 1995). In terms of textile waste, reuse as well as prolongation of products’ lifecycles
through repair, are further identified as important means for waste prevention (Tojo et al. 2012). These product recovery strategies retain the functionality and identity of used products, while in recycling the identity and functionality is lost (Thierry et al. 1995). In a resource-optimised approach, textiles would be reused as long as possible followed by recycling (Morley et al. 2009).

A commercial chain for recovered textile products requires resource acquisition through collection and sorting, followed by operations to produce a variety of marketable goods (Wang 2010; Thierry et al. 1995). Table 1 provides a summary of the recovery processes that used in this thesis. Collection and sorting precedes all the recovery processes. Economic value is the main driver for engaging in sustainable practices/processes (Ekström & Salomonsson 2014) and hence the cost aspect is added to the table. As observed, the cost aspect has a correlation to the complexity of the process.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Process</th>
<th>Requirements</th>
<th>Result</th>
<th>Cost aspects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reuse</td>
<td>Sorted and redistributed</td>
<td>Reusable for original product function</td>
<td>Same as ingoing product</td>
<td>Low costs</td>
</tr>
<tr>
<td>Repair</td>
<td>Restoration</td>
<td>Bring back to working order</td>
<td>Some parts fixed or replaced by spares</td>
<td>Relatively low costs</td>
</tr>
<tr>
<td>Re:furbish</td>
<td>Relabelling</td>
<td>Inspect and upgrade to specified quality level</td>
<td>Some parts repaired/replaced; potential upgrade</td>
<td>Relatively low costs</td>
</tr>
<tr>
<td>Re:couple</td>
<td>Maintaining basic construction</td>
<td>Inspect and upgrade to specified quality level</td>
<td>Some parts repaired/replaced; potential upgrade and design changes</td>
<td>Varying costs depending on design scope</td>
</tr>
<tr>
<td>Re:construct</td>
<td>Deconstruction and new basic design</td>
<td>Upgrade to as new quality</td>
<td>Used and new parts combined into new product; potential upgrade</td>
<td>High costs and labour intensive</td>
</tr>
</tbody>
</table>

Table 1. Recovery Processes (adapted from Thierry et al. 1995, p.120; Carlsson et al. 2014, p. 4; input from Ekström & Salomonsson 2014)

2.4.1 Collection
Potential for recovery is facilitated by collection activities, which enable further value creating activities by diverting products disposed by the first user from the general waste stream (Tojo et al. 2012). Product acquisition concerns the retrieval of used products from the market, through physical collection, sometimes by repurchasing (Krikke et al. 2004). The aim of this collection is generally to acquire resources that are directly reusable, hence garments that are clean and not broken (Tojo et al. 2012). To build a successful chain for recovered products, resource acquisition through collection and sorting must provide substantial and consistent flows of used textiles in a cost efficient way (Wang 2010; Ekström & Salomonsson 2014). Furthermore, easy access to used products as well as cooperation with downstream actors is a critical issue in product recovery for managing the timing, quality, quantity and composition of material (Jayaraman & Luo 2007; Krikke et al. 2004).
It has been revealed that collection is only financially viable in areas with high density of population and closeness to the collectors’ retail stores and sorting centres (Tojo et al. 2012). To increase the amounts of textiles collected, consumer information and convenience need to be prioritised, as collection builds on donation partnerships and consumer involvement (Ekström & Salomonsson 2014, 2012; Morley et al. 2009). Increased number of household collection schemes is suggested to achieve higher collection rates. Collection and further transportation of post-consumer textiles need to be separated from other waste types to avoid contamination, which destroys the value of the material (Morley et al. 2009).

New schemes of collection by commercial actors have been identified to affect the charity organisations ability to collect, unless charities are involved in the schemes (Tojo et al. 2012). Moreover, policies and differing levels of support for collection among municipalities are considered difficulties for collecting organisations (Ekström & Salomonsson 2014; Tojo et al. 2012). This is due to the issue of ownership of the textile waste, which currently falls under the responsibility of municipalities by definition. Consequently, municipalities are important enablers of collection in public areas, by giving permission to mainly charitable organisations (Palm 2011; Ekström & Salomonsson 2014).

In the report by Tojo et al. (2012), one charity organisation requested sharing of the economic burden of collection, as long as it do not hamper reuse activities of the legitimate actors. There is an identified lack of credibility towards textile collectors compared to other product groups (Rosinski 2013 in Palm et al. 2014, p. 56), due to a lack of transparency in the field (Palm et al. 2014; Morley et al. 2009). Scandals regarding collection of PCTW, increasing numbers of non-legitimate actors, as well as lack of authority control add to the problems and might affect possibilities of collection (Palm et al. 2014). Currently, collection and further sorting of post-consumer textiles is mainly performed by charity organisations, which need to be supported by standards and certifications to regain consumer confidence. Furthermore, there is need for a professional market to contribute to the formation of infrastructure in order to prevent non-legitimate actors to enter (Palm et al. 2014; Ekström & Salomonsson 2014).

### 2.4.2 Sorting

Sorting activities aiming at reuse of textile waste is a labour intensive process that turns waste into commodities to be resold or exported (Brooks 2012). The outcome of collected material is decided by the quality and composition. However, market demand is also an important determinant for the outcome of the material (Krikke et al. 2004). The purpose of sorting activities is to provide organisations with merchandise for reuse that is sellable on their market, thus familiarity with the market is an important success factor (Tojo et al. 2012). Through manual sorting, the top quality is identified and can be resold in second hand stores in Sweden. The rest is generally sold for export (Ekström & Salomonsson 2014). Attractive retail stores selling reused goods aim for careful selection and further display in stores and marketing (Tojo et al. 2012).
In order to provide relief for charities as the only actor in sorting, there is need for a strategic collection system that allows for separation of worn/ragged textiles from better qualities (Ekström & Salomonsson 2012). However, it is difficult to collect PCTW based on polymer type (Wang 2010). Due to high labour costs in Sweden, the majority of sorting activities are exported to eastern European countries (Carlsson et al. 2014; Palm 2011; Ekström & Salomonsson 2014). Sorting activities provide employment opportunities, and promote the use of textiles for different purposes in addition to reuse in the original intention. Technological development of textile sorting for recycling may reduce/eliminate the need for human labour, however sorting to support flows for reuse requires human assessment and expertise (Tojo et al. 2012). Furthermore, sorting based on material content requires knowledge about textile materials. At certain occasions when the material specifications are important, the material might need testing in a laboratory (Hawley 2006). Technological development in the sorting stage of the value chain could lower the costs and increase efficiency for sorting within Sweden (Ekström & Salomonsson 2014).

2.4.3 Repair and washing
The purpose of repair activities is defined as to bring used products back to function, by mending or replacement processes of broken parts while generally not affecting other parts (Thierry et al. 1995). The required level of disassembly or reassembly is usually low in repaired items, however, the quality of repaired products is generally lower than the quality of new products (Thierry et al. 1995). Washing garments is considered especially important in redesign-processes (Carlsson et al. 2014).

2.4.4 Reuse
Reuse of post consumer textiles is defined as the use of a product in its original intended function (Ekström & Salomonsson 2014). It requires the minimum amount of energy among the alternative outlets of used textiles (Wang 2010). Reused clothes are exchanged through second hand retail, leasing services or informal channels such as swapping events, consumer-to-consumer sales, and as gifts (Watson et al. 2014). The reuse process consists of collection, sorting and possibly mending, before the best quality products are redistributed to their retail environments (Ekström & Salomonsson 2014; Brooks 2012). Successful retailing of used products requires attractive and easily navigated retail stores with specialised assortment to provide certainties and thus appeal to consumers (Tojo et al. 2012). Charitable, commercial and private actors engage in resale of reusable textiles (Watson et al. 2014).

2.4.5 Redesign
Redesign aim at changing collected textiles through design characteristics that create new value for the consumer, turning collected and sorted textile material into new, usable products (Carlsson et. al 2014). The process of transforming PCTW into raw material for redesign involves disassembly and required maintenance prior to use by the end consumer (Young et al. 2004). For redesign to be successful, products need to be attractive enough to compete in the commercial market, and the retail experience must be accordingly attractive. Redesign
solutions are dependent on the quality and property of the collected materials, as well as availability of material of corresponding quality (Carlsson et al. 2014). The concept of redesign is not fully accepted and understood without good design practice (Young et al. 2004).

There are three levels of redesign processes identified by Carlsson et al. (2014). The lowest level is *re:furbish*, which is based on the selection of garments belonging to a specified quality and used in a business- or design concept in line with the brand strategy (Thierry et al. 1995; Carlsson et al. 2014). The aim of *re:furbish* is to recondition the product through small interventions, such as to freshen garments through laundry and repair if needed, and to add simple design features. The marketed concept can be augmented through neck labels, embroidery, hangtags, marketing and visual merchandising in the retail space. Examples on how to market the concepts suggest the communication of intrinsic values such as “Donated by” or using storytelling (Carlsson et al. 2014). However, quality standards are generally lower in refurbished products than standards for new products (Thierry et al. 1995).

The next level is *re:couple*, which constitutes moderate and simple changes and additions to garments. It increases the value of the ingoing material by simple means, through cutting away parts, sewing on labels, and applications, pockets, buttons or rivets. *Re:couple* could also be performed through wet processes such as laundering to give a special look, dying or printing. It is considered to have the most commercial potential, as it produces new value but does not change the basic construction of a garment. The new design features need to be easily applicable to a number of similar products to contribute to an increased value. Hence, simple instructions should enable a technician to duplicate the idea on many garments in limited time (Carlsson et al. 2014).

The highest level of redesign is *re:construct*, which is a complete remanufacturing of the ingoing material into something new. *Re:construct* activities are based on several garments as input and various production resources. It is a time consuming and expensive process, and hence gives a more expensive outcome with changed construction (Carlsson et al. 2014). The concept remanufacturing describes a process that aims at bringing used products up to quality standards equal to those of new products (Thierry et al. 1995; Carlsson et al. 2014; Östlin et al. 2008). Redesign at this level requires expertise in regards to the crafts involved as well as the garment properties, from the designer and the dressmaker assigned to perform the changes. The collected material is the starting point of the design process (Carlsson et al. 2014). Issues related to the reconstruction process include irregular pattern shapes as a result of varying form and shape of post-consumer textiles. This in turn leads to variations in the final design (Young et al. 2004).

The market and consumer demand is considered the most critical aspects of success for all redesign levels. This is in turn dependent on brand building, and that the brand and design content combined are attractive enough to be the first choice for the consumer, before conventional products. Time, marketing, communication resources and capital for persistence are crucial in market development for a new brand or operation, especially as the business
model necessitates a new consumer mind-set. Thus, in addition to a new production channel, a key issue for redesign to be attractive is related to how the product is distributed (Carlsson et al. 2014). Workshops can be a tool for encouraging reuse and repair through personal creativity, engaging consumers to take part in the design process of repurposing apparel. Here, the designer figure as a facilitator of competences in repair and redesign activities. Such workshops could be offered by universities and public services among others (Lapolla & Sanders 2015).

2.5 Theoretical framework: Antecedents of value creation in reverse value chains
In developing the theoretical framework, factors that enable value creation through recovery processes are identified. The combined insights regarding value creation, reverse logistics systems, and the recovery processes involved are categorised using the four main themes identified in the literature review. These are Logistics architecture, Supply chain network, Collaboration, and Product architecture. The framework concerns value chain specific antecedents, which can be affected by the actors in the chain. In addition to these, external antecedents are identified, which are out of reach for the individual actors but define the pre-conditions in which they are operating.

Figure 4. Theoretical connection
### Reverse value chain antecedents

#### Logistics architecture

<table>
<thead>
<tr>
<th>Collection</th>
<th>Supporting authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dense population and closeness to facilities</td>
<td>Tojo et al. (2012)</td>
</tr>
<tr>
<td>Household collection, Protective collection against contaminated products</td>
<td>Morley et al. (2009)</td>
</tr>
<tr>
<td>Transparency and credibility</td>
<td>Palm et al. (2014)</td>
</tr>
</tbody>
</table>

#### Sorting

<table>
<thead>
<tr>
<th>Strategic collection</th>
<th>Supporting authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity with the market</td>
<td>Krikke et al. (2004), Tojo et al. (2012)</td>
</tr>
<tr>
<td>Technology for sorting efficiency (recycling)</td>
<td>Ekström &amp; Salomonsson (2014)</td>
</tr>
</tbody>
</table>

#### Reuse

<table>
<thead>
<tr>
<th>Logistics operations</th>
<th>Supporting authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual merchandising, Marketing</td>
<td>Tojo et al. (2012), Ekström &amp; Salomonsson (2014)</td>
</tr>
<tr>
<td></td>
<td>Tojo et al. (2012)</td>
</tr>
</tbody>
</table>

#### Redesign

<table>
<thead>
<tr>
<th>Disassembly of material and required maintenance</th>
<th>Supporting authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand management, Capital for persistence, Brand building fit with design content, Production resources, Marketing and communication resources, Simple instructions, Distribution channels, Scalability, Attractive retail experience, Time, Availability of sorted material</td>
<td>Young et al. (2004)</td>
</tr>
<tr>
<td></td>
<td>Carlsson et al. (2014)</td>
</tr>
</tbody>
</table>

### Supply chain network

#### Dynamic capabilities

<table>
<thead>
<tr>
<th>Network design</th>
<th>Supporting authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer orientation</td>
<td>MacMillan &amp; McGrath (1997)</td>
</tr>
<tr>
<td>Coordination and information flow between actors</td>
<td>Blumberg (1999), Debo et al. (2004), Kumar &amp; Putnam (2008)</td>
</tr>
</tbody>
</table>

#### Differentiation

<table>
<thead>
<tr>
<th>Value chain strategy</th>
<th>Supporting authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialisation of core competences</td>
<td>Fleischmann et al. (2004), Jayaraman &amp; Luo (2007)</td>
</tr>
<tr>
<td>Differential labour</td>
<td>Garza &amp; Dedehayir (2012)</td>
</tr>
</tbody>
</table>

#### Identification of internal resources

<table>
<thead>
<tr>
<th>Development and protection of valuable resources</th>
<th>Supporting authors</th>
</tr>
</thead>
</table>

#### Labour activities

<table>
<thead>
<tr>
<th>Supporting authors</th>
</tr>
</thead>
</table>
### Collaboration

- Cooperation and sharing of expertise
  
  - Kumar & Putnam (2008), Möller (2006)
  
- Collaborative product- and business process, Network collaboration
  

### Product architecture/design

- Simultaneous product- and process design planning
  
  - Umeda et al. (2012)
  
- Design for multiple generation product life-cycles in the first design stage
  
  - Go et al. (2015), Ekström & Salomonsson (2014)
  
- Good design practice
  
  - Young et al. (2004)
  
- Attractiveness compared to conventional products,
  
  - Carlsson et al. (2014)
  
- Expertise in the reversed design process
  
  
- Suitable quality and properties of collected material

### External antecedents

- Standards and certifications, Professional market to support the development of infrastructure
  
  - (Palm et al. 2014)
  
- Sharing of economic burden in collection and sorting, for charity organisations, Municipality support for collection, Demand for second hand clothing on the Swedish market
  
  - (Tojo et al. 2012)
  
- Positive image towards second hand
  

**Table 2.** Antecedents of value creation in reverse value chains
3. Methodology

The methodology chapter aims at providing transparent descriptions of the research process, and starts by discussing the choice of research strategy and design. The next chapter presents the pre-study, which was the basis for case selection. Moreover, it discusses the choice of semi-structured interviews for data collection and the method used to perform the data analysis, while evaluating the significance of the research in the last chapter.

3.1 Research strategy and design

By reviewing previous research on post-consumer textile flows in Sweden, the observed low level of value creation from textile waste became the starting point for framing the purpose and research questions. The literature review, research methodology, and pre-study were performed concurrently, which allowed for adjustments and further specifications of the parts. To answer to the identified research questions, a qualitative research strategy was applied, as it is concerned with interpretations of the social world from the perspective of the studied units (Bryman 2012). It was chosen to provide flexibility to the research process and to further allow for unexpected knowledge and insights (Bryman 2012). The aim of qualitative strategies is to provide understanding of a phenomenon (Marshall 1996), in this case the preconditions and challenges for value creation of PCTW in Sweden.

A deductive approach was chosen, which is suitable for qualitative research when concepts studied are clear from the beginning, and hypotheses can be drawn between their relationships before the data collection (Hyde 2000). The theoretical framework consisted of the combined understandings from the literature review, comprising antecedents of value creation in reverse value chains. In line with the deductive research approach, the framework was tested to determine the applicability of the theory to the specific context of the study (Hyde 2000; Kovács & Spens 2005; Bryman 2012). After the testing, results were interpreted to identify the implications of the research to the theory (Bryman 2012; Hyde 2000). This allowed for an update to the theoretical framework, adding the textile industry context to contribute to existing theories.

Consequently, the theoretical ideas have guided the process of data collection and analysis (Bryman 2012). A multiple case study design was applied to perform the empirical study, providing deep information from several sources. Case studies have been suggested useful when little is known about a specific phenomenon, and are especially advantageous when studying business networks (Halinen & Törnroos 2005). A network of actors was identified in the pre-study, which are in different ways contributing to the same objective and the handling of PCTW. The case study design was an examination of the actors’ operations, with the aim to reveal important features about their preconditions and challenges (Bryman 2012). To do so, cases were compiled and analysed together to find patterns (Yin 2014) of value creation efforts and antecedents. The multiple case study design is generally considered robust as propositions are deeply grounded in varied empirical data (Eisenhardt & Graebner 2007).
3.2 Pre-study
To understand the industry structure, a mapping was made over the current network of actors managing PCTW in Sweden, with the aim to create an easily understood model to provide overview. This allowed for visualisation of the PCTW-flow and the identification of actors and processes taking place in this network. Hence, the mapping enabled analysis of the value creation points as well as points of value loss and textiles disappearing outside the Swedish borders. Furthermore, the network map was used to identify potential cases for the study, and it was the starting point for framing the interview questions.

The network map was triangulated using secondary and primary data. Secondary data were used in analysis of previous documentations of flows and actors taking part in the management of PCTW in Sweden. Primary data consisted of phone conversation and emails with actors to establish the links in the network. These included representatives from charity organisations (the Swedish Red Cross, Human Bridge), business developers at waste companies (Ragn-Sells, Renova) and a municipal department (City of Gothenburg Waste and recycling). Previous mappings have identified actors and flows/amounts of textile waste in various channels. However, none visualised the system in its entirety and with the linkages in terms of value creation. Documents studied were from Ekström and Salomonsson (2012, 2014), Tojo et al. (2012), Naturvårdsverket (2013) and Palm et al. (2014). Insights from the secondary data were compiled in a literature review regarding mappings and general actor categories, which is provided on request.

The network map was used to initiate discussions at the interviews, and was continuously updated with new findings. Such findings were for example better insights regarding the linkages and processes in the network, especially from charity organisations and the way that redesign brands are operating. Hence, the multiple cases also contributed to shaping the pre-study mapping. Supported by interview findings, this map was used to describe the current state for managing PCTW in Sweden. However, it should be noted that the mapping is based on what the authors were able to retrieve during a limited time period. The pre-study map is presented in chapter 4.1.

3.3 Case selection based on pre-study
The sampling process was guided by the research questions to identify suitable cases (Marshall 1996). Accordingly, both cases and their representatives were chosen by criteria relevant to the scope of research through purposive sampling (Marshall 1996; Bryman 2012). The scope of research concerned value creation from upgrading processes in contrast to actors dealing with down cycling. With guidance from the pre-study map, actors were identified and contacted after further research into their business models through secondary data. This way, the cases most suitable to answer the research questions were selected based on their experience in the field (Marshall 1996). It has been suggested that cross-case analysis of four to ten cases provide a good basis for drawing analytical generalisations with sufficient empirical grounding (Eisenhardt 1989). This has guided the definition of the sample size.
These cases were Swedish organisations that represent the three general categories of actors chosen for the study: *charity organisation, clothing brand* (product developing brand manufacturer), and *redesign brand*. The criteria for selection were that the actor should collect and/or create value through reuse or redesign of collected material. By studying a number of actors from each category, a representative sample was pursued. The pre-study further identified other types of actors, however, only actors who are regularly engaged in value creation of PCTW were studied. Moreover, informal channels such as consumer-to-consumer and private second hand stores were not studied with regards to their volumes and selective approach to collection of PCTW.

Qualitative sampling aims for data saturation, meaning enough data has been collected to not reveal any new or relevant information (Marshall 1996; Bryman 2012). This was discovered as certain themes of analysis were recurring among the cases, especially among charity organisations and redesign brands. A level of anonymity was pursued in the analysis in order not to put focus to the individual cases, but to the insights from the categories combined. Therefore, the name of the organisations will not be used hereafter. Thus, when referring to the cases in the further text, the case id’s provided in Table 3 will be used. Short descriptions of the cases are provided in Appendix 1.

<table>
<thead>
<tr>
<th>Actors</th>
<th>Case</th>
<th>Organisations</th>
<th>Activities</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charity organisations</td>
<td>1</td>
<td>Emmaus Björkå</td>
<td>Collection, Sorting, Reuse</td>
<td>Association manager second hand, Sorter</td>
</tr>
<tr>
<td>(CO)</td>
<td>2</td>
<td>Human Bridge</td>
<td>Collection, Sorting, Reuse</td>
<td>Collection manager</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Mytorna</td>
<td>Collection, Sorting, Reuse</td>
<td>Sustainability manager</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Swedish Red Cross</td>
<td>Collection, Sorting, Reuse</td>
<td>Manager of textile area</td>
</tr>
<tr>
<td>Clothing brands (CB)</td>
<td>1</td>
<td>Boomerang</td>
<td>The Boomerang Effect</td>
<td>Marketing Manager</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Haglöfs</td>
<td>Swap Stories</td>
<td>Director of sustainability</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Uniforms for the Dedicated</td>
<td>Rag Bag</td>
<td>Co-founder and Head of Sustainability</td>
</tr>
<tr>
<td>Redesign brands (RB)</td>
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<td>Design Stories</td>
<td>Product development</td>
<td>Co-founders and designers</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Mocklis</td>
<td>Product development</td>
<td>Co-founder and designer</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Skryta</td>
<td>Product development</td>
<td>Co-founder and designer</td>
</tr>
</tbody>
</table>

Table 3. Case description

### 3.4 Data collection: semi-structured interviews

The data collection method applied was focused interviews (Yin 2014) with the aim of illuminating the state-of-art for value creation of PCTW among the selected cases. Open-ended questions were asked regarding the actors’ value creating activities and operating environments in order to identify enablers and disablers, see Appendix 2: Interview guide. The most pertinent questions to identify the enablers of value creation were “What resources enable the activity?”, “What is preventing you from engaging in this type of value creation? Actors or structural problems?” and “Do you collaborate with external parties in order to perform the activity?”. The semi-structured form allowed for a level of standardisation for the feasibility of the data collection and analysis, while at the same time opening up for
unexpected perspectives from the respondents. Further, the interview setting encouraged the respondents to share rich descriptions of their operational environments (Bryman 2012).

Majority of the interviews were conducted in person at the respondents’ facilities, where the conversations were recorded to later be transcribed for analysis. Two interviews were conducted over telephone and one over email due to practical reasons. Some days before the interviews, the respondents received the interview guide and network map in order to prepare. This was a strategy to guarantee that the right person had been reached, with the right competences to answer the questions. Furthermore, some of the questions were believed to require preparation from the respondent in order to provide more insights. Accordingly, some questions required some thinking and retrieving of numbers in beforehand.

The time of the interviews varied, from 26 minutes to 1 hour and 10 minutes. During and after all interviews notes were taken on the most interesting aspects. When analysing the transcribed material, follow-up questions were sent to the respondents by email when there was a need to confirm or extend the data. Examples concern clarifications regarding laundry processes and additional numerical data such as collection rates from actors who did not reveal this in the first interview.

3.5 Data analysis
The rich data obtained from the interviews was analysed using qualitative coding, aiming at breaking down and rationalising data into categories that can be related to concepts or theories (Bryman 2012). The transcripts were printed and coded by hand in the within-case analysis (Eisenhardt 1989). The codes used in this process were Enablers, Disablers, State-of-art descriptions, and Prospects/enablers of future plans. The last mentioned was later removed to delimit the study.

To answer RQ1, the state-of-art descriptions were analysed between cases and categories through comparative analysis. To visualise the current state of value creation in terms of recovery processes undertaken by the actors, results were plotted in a matrix (see Table 4). This plotting was delimited to strategic decisions from top management, or that activities were widely spread and established within the organisations. In addition, the mapping and matrix were complemented by narrative descriptions with quotes from respondents to describe the current state of their operating environments. In order to identify the different levels of redesign initiatives among the actors, suggested categories from Carlsson et al. (2014) were used.

When analysing the coded data to answer RQ2, common themes emerged across the individual transcripts as well as in categories of actors. A theme has been defined as a recurring idea or category identified by the analyst, which relates to the research questions and provides a basis for theoretical understanding of the data (Bryman 2012). When searching for antecedents of value creation in the transcripts, a framework approach was undertaken (Bryman 2012 p. 579). Antecedents were identified through comparing respondents’ reflections and matching coded Enablers and Disablers. Initially, cross-case analysis
(Eisenhardt 1989) was performed between the cases in the three categories of actors, from where results were compiled in a category framework. These frameworks were then used for analysis across categories. The results of this analysis constituted the empirical framework, which was compared to the theoretical framework in the Analysis and discussion chapter.

3.6 Quality criteria and assessment of research

This thesis has employed a qualitative adaption of validity and reliability when assessing the research (Bryman 2012). In addition to these concepts, construct validity has been discussed, together with internal validity. These concepts are suggested preconditions for any external validity in case studies (Gibbert et al. 2008). Construct validity concerns the extent to which a study investigates what it claims to investigate, and hence needs to be considered during data collection (Gibbert et al. 2008). To answer to this requirement, the pre-study was discussed with and assessed by the respondents of the study to ensure its validity as an industry overview. Moreover, the choice of semi-structured interviews was based on the belief that the antecedents would be revealed in the rich descriptions, highlighting attitudes that can only be noticed in a qualitative conversation. The questions asked provided rich data, which pointed to the interest of discussing the issues and that the issue was properly addressed.

Internal validity refers to the data analysis, and assesses the relation between observations and theory (Yin 2009; Bryman 2012). This has been approached by a clear research framework, which was compared to the corresponding empirical framework developed from the interview findings. The theoretical framework was developed based on seminal works on the topics in focus, combined with up-to-date research, to approach theoretical saturation. There was a small amount of research identified on the textile context of these topics, and the ones found stated the same problems. Furthermore, pattern matching was performed using the themes from the theoretical framework to retain a strong connection (Gibbert et al. 2008; Yin 2014). It should be noted that interviews were conducted and analysed in Swedish language and that findings and quotes therefore had to be translated into English. To communicate the findings properly, minor rephrasing have therefore been necessary. For the same reason, some specific words have been changed to the most accurate translation, when expressions used by respondents could not be directly translated. To compensate for this, transcripts and recordings have been assessed several times in order to avoid misinterpretation.

External reliability refers to the replicability and consistency of a study over time, which is generally considered an issue in qualitative research (Gibbert et al. 2008; Bryman 2012). By sampling several cases from the three categories of actors, generalizability was pursued. However, due to its limitation to Sweden and a specific point in time, results might not be generalizable to PCTW-networks in other countries. A detailed and transparent description of the methodology is required to increase replicability (Gibbert et al. 2008), which has been provided. However, qualitative in-person interviews are meetings between people and are consequently shaped by the personalities and values by the researcher.
Furthermore, the used textiles-industry is a fast moving industry with major changes happening presently, due to both governmental involvement and voluntary initiatives. Hence, the context in which the thesis was conducted is developing, which affects the repeatability of the results. The research process has been supervised and influenced by experienced researchers, who have assessed the tools and consistency of analysis, hence enhancing the quality of the research (Bryman 2012).
4. Interview findings
This chapter presents the most important findings of the data collection in relation to the purpose and research questions. It provides a narrative description of the recovery processes and their enabling attributes from the perspective of the ten cases interviewed for the study. First, a description of the state-of-art is made using the network map developed in the pre-study, followed by descriptions of the recovery processes. The chapter is concluded by the development of an empirical framework summarising the most important attributes found in the data analysis. The cases are referred to using the abbreviation for the category type and the case number.

4.1 Pre-study: The network managing PCTW in Sweden
The identified network, visualised in Figure 4, constitutes actors who are in one way or another responsible for post-consumer textiles, at one or several points in the flow from consumer disposal to end-of-life or a new lifecycle. The oval shapes in the model represent types of actors, where waste companies, charity organisations, and clothing brands are identified as the focal actors managing PCTW. Consumer to consumer and Private second hand stores handle flows of textiles that are not yet perceived as waste. Focus in this study has been to the main value creating actors, marked by red in the model. These are actors creating new use-values and exchange-value by several steps of recovery processes. The activities taking place in the network are marked by the coloured ovals in the model.

Figure 5. Mapping of the network handling PCTW in Sweden
When a consumer disposes a garment that has lost its perceived use-value, it goes into one of the six identified channels; *private second hand stores, consumer to consumer, clothing brands, charity organisations, waste companies* through the general waste stream, or the experimental *collaborative collection initiatives* (e.g. between municipalities, housing companies, waste companies and charity organisations). This constitutes the first critical decision point of the PCTW value chain. *Waste companies* have a distinct position current as they handle the largest amounts of PCTW, though this position is aimed to decrease through the value creation efforts of other actors.

The largest collected flows of PCTW goes through *charity organisations*, who collect material from consumers through multiple channels, and through donation partnerships with retailers and *clothing brands*. Material collected by charity organisation is *sorted* in own facilities to identify the further paths of the goods, constituting a division point of the value chain. The top quality garments that can be sold for *reuse* in Sweden are separated from the masses, and the majority of the remainders are exported. *Export* is the largest outlet for PCTW today (73-95 % in the cases), with Poland and the Baltic countries as major markets as stated by CO1 and CO3. Both sorted and unsorted goods are exported to the various markets, packed in bales or big-bags and sold to kilo price. Hence, export provides lower incomes compared to selling the garments for reuse in Sweden. Further, sorted material is sold cheaper than unsorted, as the best qualities are taken out. Some *charity organisations* work with *redesign* in small-scale projects, but not regularly. However, they do provide material to *redesign brands*, both sorted and unsorted. *Donations* are generally rare and not organised, except in CO2. Contaminated or broken garments with no further usability are sent to *waste companies*. These amounts differed among cases (7% in one case, 10% in another).

*Clothing brands* engage in collection of post consumer textiles through their own shops. Some *clothing brands* and retailers act as middlemen between consumers and *commercial collection and sorting companies*, and hence the clothing is not *sorted* but directly sold. Others are selective of which garments they accept due to internal processing for new value creation through *reuse* and/or *redesign*. *Redesign brands* are product developers who use PCTW as raw material for their products. Generally they receive this material from *charity organisation* with whom they (sometimes) collaborate with in projects. The redesigned products are manufactured by a third party.
4.2 State-of-art: Value creation in the current system

<table>
<thead>
<tr>
<th>Case</th>
<th>Collection</th>
<th>Sorting</th>
<th>Reuse</th>
<th>Repair/ washing</th>
<th>Re:Furbish</th>
<th>Re:Couple</th>
<th>Re:Construct</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<td>X</td>
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<td>X</td>
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<td>X</td>
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<td></td>
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<tr>
<td>CO3</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
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</tr>
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<tr>
<td>CB1</td>
<td>X</td>
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<td>CB2</td>
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<td>X</td>
</tr>
</tbody>
</table>

Table 4. The state-of-art of value creation among cases

4.2.1 Collection
All cases except Redesign brands engage in collection of PCTW. However, the nature of the actors’ collection schemes differs according to the categories. The charity organisations (except CO4) are highly dependent on the municipalities as enablers for collection, by supplying permissions for public collection points. This engagement and the differences in conduct from municipalities is a discussed issue among all charity organisations. CO2 identifies a relief in the process of obtaining permission for collection from the municipalities, “[...]it has been very difficult until a year ago but now it’s different, not least thanks to the national waste plan from Naturvårdsverket [...]].” CO3 also identifies “[...]a competition from the municipalities who wants to do everything themselves [...]].” Further, all four cases highlight the problem with non-legitimate collecting actors, who steal and vandalise the organisation’s collection properties and consequently lowers the credibility of the legitimate actors. Unclear regulations and the lack of certifications are discussed by all charity organisations as affecting their possibilities to collect. CO2 emphasises “[...]you have to manage the emptying and equipment so that it isn’t unsightly but is perceived as a service for the citizens.”.
### Table 5. Cases’ collection points and amounts

<table>
<thead>
<tr>
<th>Case</th>
<th>Amounts yearly*</th>
<th>Collection point</th>
</tr>
</thead>
</table>
| CO1   | 3100 tons**      | Bins in public sorting stations and recycling centres  
|       |                  | Pick-up trucks  
|       |                  | Events  
| CO2   | 7700 tons**      | Bins at municipal recycling centres and recycling stations  
|       |                  | Curbside bins  
|       |                  | Household garbage rooms  
|       |                  | Retailers  
|       |                  | Private second-hand shops.  
| CO3   | 8000 tons        | Own second-hand stores  
|       |                  | Bins in municipal recycling centres  
|       |                  | Own events  
|       |                  | Retailers  
| CO4   | 5000 tons        | Their own 280 second-hand stores  
|       |                  | Workplaces and schools  
| CB1   | 1600 garments    | Own stores  
| CB2   | 300-400 garments | The Swedish flagship store in Stockholm  
| CB3   | N/A              | Rag Bag  

* The numbers are approximate  
** The numbers are for ‘original collection’ and can include other things than clothing.

In any collection activity, consumers are the source of raw material and logistics operations needs to be developed to easily engage them to donate. The logistics operations regarding the transportation of collected material is different between charity organisations and clothing brands. Charity organisations are generally self-sufficient in their operations, covering everything from logistics to retailing by themselves, however they are dependent on municipalities for collection permits and labour resources. CO2 runs everything in-house, while CO3 use some external logistics entrepreneurs as a complement to their own haulage operations. The collection and transportation of material is an extensive process in charity organisations, due to the amounts collected. CB1 depends on logistics providers to transport goods collected in the stores to the warehouse and back, however CB2 does not at all engage in any transportation of the goods as they are directly resold at the collection point.

Charity organisations use multiple collection channels that enable broad coverage of the market to ensure volume, which is emphasised especially by CO3 who wants to double their volumes in the coming years, “Because so much is incinerated right now. It’s a way for us to contribute.”. However, CO1 admits that the many small collection points is something that they have split feelings about: “[...]there are so many small collections, thus there will be no large volumes [...] it costs quite a lot to drive around [...] and that is not good for the environment either [...]”. To reduce impacts and costs of transportation, the warehouse facility for textiles is located in Gothenburg, close to the collection points.
In addition to the collection points in Table 5, alternative channels of collection are mentioned by the cases as a way to come closer to consumers and to reach new target groups. CO3 performs event collection at diverse places such as flea markets, swapping events, shopping malls and collection days at companies. This is something they strive to develop right now as they “[…]want to collect volume. But it’s as much about us wanting to influence public opinion, reach new people in new contexts, new arenas.”. This type of collection is also emphasised by CO1, who collects in collaboration with workplaces and schools, as well as any event where a great amount of unwanted stuff is left. Furthermore, they have recently engaged in a collection project together with ‘Farligt Avfall-bilen’ in Gothenburg, where they collect through pick-up trucks together with a municipal waste initiative. CO4 complements their in-store collection with collection at workplaces and schools, however they state they “[…]must become better at collecting closer to the consumer […] but then a new logistics chain is required […].”

Collection close to the consumer is pursued by all charity organisations, as an enabler for increasing the volume, through different strategies. CO2 and CO3 identify collection in household recycling rooms as an important and growing channel, in partnership with waste companies and property owners. CO1 has launched an experiment with the aim of positioning themselves already in the consumers’ homes. When informing about their collection together with ‘Farligt Avfall-bilen’ they put notes in peoples mailboxes, with which they also provide a plastic bag for consumers to fill or to store in the wardrobe until full. This way, they aim to remind the consumer and to be the first choice before both the waste bin and other collectors.

CO2 and CO3 have developed donation partnerships with retailers, in order to increase volumes and coming closer to the consumer. CO3 collaborates with Indiska and Lindex in collection, however they state it “[…]gives tiny volumes […] we are talking about some kilos per collection.”. CO2 collects PCTW and surplus from retailers such as Stadium, Gina Tricot, and Gekås Ullared, as well as private second hand stores with excess clothing. CO1 state they want to initiate this type of relationship with retailers, especially those with a higher product quality to provide more reusable clothing in their collection. Partnerships with retailers are discussed also by CB2, who identifies their role as wholesaler as a barrier to increase collection. Their main sales channels are through external retailers, which are not willing to set up a collection system for their merchandise. This way, they are currently limited to their flagship store and in the future possibly partner stores, who due to their relationship might be willing to initiate collection. This is however not a problem for CB1, as they own their retail stores. Hence, the relationships with retailers are important to achieve volume and quality in collection.

Quality of collected material is an emphasised enabler for further processes, especially as garments are reused in their original form. In order to extract the maximum economic value from the collected material, CO3 has changed into a communication in their collection schemes called “Torrt & Rent” (Dry & Clean). Two of the clothing brands that collect are selective in their strategies and only collect their own garments. This enables them to set the rules for what is accepted, “[…]it is said that they should be clean and whole.”. CB3 provides
a channel for the consumer to dispose any quality, which is enabled by a charity organisation as the receiver of collected garments. This allows them to collect any type of quality. When making a purchase at their store, the consumer receives a shopping bag which can be turned inside out to become a pre-paid postage bag, in which the consumer can put a garment, seal the bag and send it by post.

CB3’s collection channel was developed closely with their advertising agency and relies on a third party logistics provider as well as a receiving charity organisation. The concept is enabled by existing logistics systems, through their collaboration with the Swedish Post. “We have a very simple solution [...] we do not need to build a new infrastructure but we can use the existing logistics system.”. Their system is built around the ease for consumers to contribute within their daily routines. This has proven effective as the response rate has been high compared to similar projects performed by other companies. CB3 wants to spread the concept to become a solution for the entire industry. However, they did identify the work pace of the logistics provider as a bottleneck and are therefore looking into alternatives where there is a higher frequency of transports. Also CO1, who sees an increase in the number of donors, stated that you have to “Make it easy for people [...]”, which requires knowing the lifestyles and routines of possible donors. Besides the physical convenience of the concept, the clarity of the concept was emphasised by CB1 to achieve consumer involvement, which is necessary to access material to perform further processes.

Consumer involvement is pursued differently in charity organisations and clothing brands, however both can be perceived as means to get the consumer engaged. CB1 and CB2 give vouchers to consumers when handing in their old clothes “[...]to give an incentive to do it [...]”. CO3 and CO4 press the issue of awareness among the donors of the social benefits of donating to a charity compared to a commercial collector. CB2 states that “[...]we are able to receive more than we do. There are relatively few people who come and turn in their products.” The amount of garments received by consumers is considered as the main limitation of the value creating possibilities at CB1 as well. In addition, both cases state that the lack of recycling possibilities limits their take-back. CB2 works with a supplier who produces recycled synthetics, however the supplier does not accept consumer take-backs from the company.

Furthermore, the increased engagement of clothing brands have been identified as a new competition in the market by some of the charity organisations, both in terms of collection and attention in media: “[...]they give offers to the customers if they turn in their garments. How can we receive anything else than socks.”, as stated by CO4. However, CO3 emphasise “They take the issue more verbally [...] in the public opinion [...] but not in the collecting volumes.”.

### 4.2.2 Sorting

Sorting is identified by the majority of the cases as a critical process for the success of further steps in the value chain. Charity organisations are the only sorters of mixed qualities in
Sweden, while CB1 performs sorting of the own brand according to their selective collection program. In their value chain, collected material is sent from the stores to the company’s warehouse facility in Uppsala where garments are sorted in terms of what can be resold through their concept ‘Vintage’, and what can be redesigned into something else. Approximately 50% of collected garments are considered to be reusable according to the company’s standards.

The aim of the sorting activities in charity organisations is to identify the top quality garments and textiles that can be sold in the organisations’ stores to provide profit. Due to the large inflow of mixed quality material, the sorting process includes many steps and is a labour intensive process. All charity organisations identify that not all collected material can be sorted due to limited capacity as well as consumer demand, in relation to the inflow. CO3 emphasises that the main reason for exports is this “[...]{gap between how much we collect and how much there is a demand for in our stores}”, and that they do not have the capacity to go through the huge inflow of material. CO2 sorts approximately 10 % of their collected material in own facilities, which may comprise everything from the desired textiles to toys, shoes, books, and garbage. CO1 sorts approximately 88 % of collected material, hence the remaining 12% are exported as unsorted goods. CO3 states a varying amount of sorted material, due to varying consumer demand and donations, where volumes in collection are larger during holidays, which increases the need for sorting at certain periods during the year.

The export of unsorted goods, as a result of the pressured sorting, implies a risk of missing out on high quality garments that could have been priced higher if sold in the organisations’ stores in Sweden. This is evident in all charity organisations, as CO4 emphasises “[...]sometimes it can sadly also end up nice clothes there[...]”. Due to this, valuable garments suitable for reuse in Sweden are being exported to a lower price in the unsorted flows.

CO1 has one facility for textile sorting placed in Gothenburg, where collected material is sent for processing. The first step of the sorting process is a coarse sorting to separate waste, and further to define what channels are suitable for the material at hand. These outputs are channels for reuse, export or waste deposit for contaminated or damaged textiles. Material for export is sorted into two categories, one with Eastern Europe as destination and another to warmer countries, packed in bales called ‘summer mix’. Around one fourth of the sorted material is considered sellable in the own stores, and this is sorted in the categories; Menswear, Womenswear, Childrenswear, ‘Retro’ and Home textiles. In this fine sorting, the quality of the garments is assessed and the garments are valued and priced accordingly, which requires a high level of expertise according to CO1. There are three price categories ranging from the more expensive ‘Retro’ assortment and designer clothes, to the middle range with varying prices and a low price segment.

CO2 have several sorting facilities of different scope. CO3 has a comparable strategy in sorting, with 7 own production facilities. They emphasise a separation of production and retail processes, similar to the operations of conventional retail brands. This separation is due to the need for expertise in sorting and valuation, as also identified by CO1, and by that the
production facilities provide the retail stores with priced garments ready to sell. Furthermore, CO3 stresses the importance of sorting as a core competence, which is constantly being developed to better meet consumer demands and relate to changing trends in colours, garments and styles “ [...] that’s where you need to work with your processes to really be able to manage it and to manage it flexibly”. The sorting process follows the steps of coarse sorting, fine sorting, putting garments on hangers, price tagging, and packaging for transportation to stores. In addition to their own channels, CO3 has sorted out shrunken wool and torn leather, with no further consumer value, for designers who produce or experiment with the materials.

CO4 is organised differently compared to the other charity organisations in terms of decentralisation, as “[ ...] every shop is legally owned by the local association[ ...]”. Collected material is therefore sorted directly in the stores, where they are later sold. This makes it hard for the organisation to achieve uniform sorting criteria as the sorting process is based on subjective assessments by their volunteers. As most of these volunteers are seniors, low levels of knowledge in current trends are considered another barrier to the sorting activities in CO4. CO4 have set up 15 collection depots across Sweden, where material that can not be sorted, sold or refined are sent. From the depots, the surplus material is exported to Kici, a Dutch collection company.

To answer to the requirements for expertise in the sorting process, and to become more agile to trend changes, competence development through education is discussed by CO1, CO3 and CO4. In CO1, two employees organise trend meetings every season to increase awareness about certain trends and identify the most valuable garments in sorting. CO3 organises similar trend meetings and have, at occasions, worked with the Swedish Fashion Council for courses for the responsible sorters to take. CO4 is currently developing educational material for their employees and volunteers. They are planning three days of lectures and workshops at their facility in Vänersborg to discuss expected trends for the coming fall, what to think about in sorting, as well as developing a mood board to hang in the sorting facilities. Further, this will be filmed and uploaded to the organisation's intranet so that all employees and volunteers can take part of the new knowledge.

The lack of separated collection possibilities, even though attempts are made by some charity organisations, has been noted to impact the sorting and further processes also for the redesign brands studied. RB1 states “[ ...] it is hard to collaborate with the charity organisations [...] they are operating on the margins and have other things much more important than sorting extra for someone.”. The charity organisations all discuss the issues of deposition of the large amount of materials collected that is not suitable for their operations. The lack of deposition options for unusable garments is noted both by the clothing brands, CB1 and CB2, as well as all charity organisations, which are struggling with the deposition of the vast amounts of dirty, broken or unsalable textiles in their collection. CO1 explains that they “[ ...] receive so much garbage and broken and dirty [...]”. They further state that they “[ ...] don’t have any deposition yet for this textile [...] one could have recycled it in one way or another then.”. CO2 emphasises the necessity of having a holistic concept for deposition for the unspecified
collection to be financially viable. For this reason, CO2 has recently started a new company, ReturTEX, together with the Dutch company Boer Group. This platform will collect PCTW from recycling centres, waste companies, housing companies as well as from smaller charity organisations in the Nordic countries, starting with a pilot plant for textile sorting in 2015.

Due to the large need for human labour in sorting activities, charity organisations rely heavily on free labour from social projects in municipalities. This in turn affects their operations as capabilities and competences are constantly changing in the organisations. However, this is also an integral part of their social agendas. In CO2, the sorting processes rely on cooperation with municipal initiatives and labour departments using the sorting as a rehabilitation facility. Workers are at the sorting facility during a limited time period with individual objectives. This way “[...]sorting is an instrument to achieve the objectives, as it creates a workplace-like environment that is favourable for this kind of activity.”. In addition to their employees, CO1 performs workplace training with around 50 people every day in their stores, inventories and transportations. Furthermore, they collaborate with municipalities’ daily activities programs to support collection and sorting processes. As in CO1 and CO2, CO3 facilitates workplace training in their sorting activities and further retailing, while CO4 rely mainly on their volunteers. The use of this type of labour adds another dimension to the core competences of the charity organisations, which requires time. CO1 states that “[...]many of our employees are supervisors for these people too, and that makes us not as efficient as if we would have been a commercial company [...]”.

All redesign brands emphasise the critical issue of sorting for the success of further processes. As the only source of sorted PCTW, the charity organisations have an important role as enablers for the redesign brands’ operations. RB1 has in a previous project developed a product prototype for CO1, which provided them with material of pre-specified colours. However, an additional sorting process was required to select the garments suitable for their designs. Moreover, RB1 has tried to develop other projects “[...]but it has failed just because we had to stand there and sort it ourselves to get access.”. RB2 and RB3 initiated their redesign projects through the platform Around Collective (Studio Redesign) and were provided with unsorted material from CO4. After identifying the most suitable materials to work with, RB2 and RB3 gave a sorting contract to a third party because of the huge amounts of waste to go through. The external sorting was critical for the project as “It wouldn’t have worked otherwise.”.

Today, RB3 and CO4 have developed a partnership where RB3 receives sorted material from CO4 to use in their products. RB2 states that their access to material is highly uncertain, as they feel that CO4’s sorting operations are not developed enough. This has implications on their ability to meet large customer orders, due to unsure access and long lead times. RB2 identifies this uncertainty as one of the most important challenges “[...]we have a lot of material today, but when we run out, how can you secure the next delivery?”.
4.2.3 Repair/Washing
CO1 has sewing- and washing machines at their warehouse facility for textiles in Gothenburg. They repair and wash high quality clothing if it is considered to increase the value of the products “[...it needs to be worth more than 100 SEK in order for the repair to be profitable.” CO1 has initiated Lapp & Lagning (Patch & Mending), where they repair clothes that are in good condition except from a small hole or a missing button. However, this is not performed in a large scope. CO2 does not perform repair and washing on a regular basis. During certain periods, when there is pressure on the organisation to accept more participants from the municipal labour departments, they perform repair and washing. CO2 does not consider repair and washing to give added value to the final product compare to the resources put into it. However, a part of the garments sold through their online shop are repaired and washed

CO3 does not perform washing “[...]washing would be completely out of question, due to the volumes and I think that the environmental gain would be reduced drastically [...] given that the consumer still go home and wash it afterwards [...]”. CO3 does not perform repair. However, they sell broken garments if they are considered to have a high level of fashion and inform the consumers about the defects. Further, CO3 has placed a sewing machine on trial in one of their stores to explore the interest among staff to repair “[...]in that store, there was a girl who could sew [...]it’s not a skill that we can always count on to be available in a store.” CO4 perform repair and washing in a small scale compare to the amount of products sold. The scope varies among the stores ”[...]in some places, they run several machines a day.” They are currently discussing whether to collaborate with a laundry, but nothing is decided yet. CO4 identifies a value addition to the products that are repaired and/or washed. If a garment is repaired or not also depends on “[...]knowledge and interest from the sewing groups.” Further, they point out repair and washing as necessary activities before other up-cycling processes can be performed.

CB1 performs washing on all the collected garments in their warehouse in Uppsala. CB2 does not perform repair and washing but have the tools and machines to repair smaller defects in their flagship store. In their recent project, RB1 washed a part of the collected material, the rest had already been washed by the consumers or by CO1. RB2 performs washing of the materials by themselves but is discussing to outsource the activity to their sewing supplier Kriminalvården. They do not perform repair, only cut away what is broken “[...]the material cost becomes the labour cost to create the material and then you might have to evaluate that this cost [...] is too big since you’re creating a new textile [...]”. RB3 outsources the washing activity of PCTW to their sewing supplier, Kriminalvården.

4.2.4 Reuse
Reuse provides the best margins of the different channels possible for the deposit of PCTW. CO1 run 7 retail stores selling second hand clothes and interior products. They estimate that approximately 22% of collected material is sold in their retail stores and that they “[...]try to

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sell as much as possible in Sweden so that we don’t have to transport it away.”. In addition to their own stores, there are 13 independent stores run by participants at daily activities in different municipalities. CO1 contributes with products and guidance, and receives the small surplus generated from the stores. Around 200 people are involved through this collaborative initiative. CO2 operate 10 retail stores selling 11-12 % of the sorted material as it represents the top quality. The stores are run by employees with support from participants in the ‘phase 3’ program. However, they state that “[...]the most important resource is the sorting [...] and that is enabled by the municipal labour authorities.”. The turnover for CO2 was 17 million SEK in 2014.

CO3 sell 20 % of the collected textiles for reuse in their 35 retail stores, which represents 1.7 million textile products yearly⁴. They own the stores, which implies that they have full control over their entire operations. CO4 differs from the other charity organisations in the second hand retail business. They operate 280 retail stores, individually owned and run by the local associations of 320 employees and 10.000 volunteers in total. The ownership model implies “[...]a big difference in operations if you compare to Myrorna.”. The reuse model has developed organically as member groups have realised that fundraising money in donation-boxes and through lotteries is not very effective. As a local group decide to open a store, this gives “[...]a strong support, because the area has a need for it.”. The charity organisations’ logistics operations for reuse are similar to those of conventional retailers in that they have separated production and retailing operations in all cases except CO4. Both CO1 and CO3 state that opening up more retail stores is a possibility for them to increase reuse in Sweden, and that inflow of material and consumer interest is big enough.

The stores run by CO1 becomes segmented from the merchandise they receive and the two city stores, in Gothenburg and Malmö, receive a special assortment further discussed under Re:furbish. CO3 is not working with niche assortments in the stores. However, they note that some stores are perceived as niche stores but this is not a conscious strategy. The reason is an interest and competences among staff and volunteers within that specific store. The niche strategy is currently being discussed since they are in a transition process regarding the production- and retail model, with the aim to strengthen reuse.

CO1 emphasise that their core business is reuse as it brings the greatest benefits “[...]because then we save most of the resources [...]”. They want to focus on reuse because there is already an identified target group for that product [...]someone have designed this garment with a consumers in mind [...] CO3 emphasise that what is put on the market in terms of qualities and quantities in the first design phase, is crucial to create a good reuse-market. Further, they identify the low prices on new products as challenging in order to achieve profitability “[...]a new t-shirt from H&M costs 50 SEK [...]”.

CO1 identify several consumer groups buying from their second hand stores and that the groups are increasing. A very large consumer group is people who cannot afford to buy new products. Another segment is consumers looking to make a bargain, as well as a group of consumers who wants to express its unique identity through reused garments. CO1 and CO3 both state an increasing demand for reused clothing, however still limiting compared to the large inflow. Further, CO2 notes a relatively big interest for second hand in Sweden compared to other countries. However, the stores sell-through rate is not always consistent with the amount sorted for them.

CO3 want to increase the amount of garments sold for reuse and are planning to improve the stores and competence in sales. In addition, they are working to improve sales strategies such as through discounts, price image and service. Moreover, they collaborate with the auction company Bukowskis to sell their premium donations. CO3 is considering alternative channels online, however they state that the profitability is more uncertain in these channels. In CO4, sorted material is first sold in the store that receives and handles it. If a garment cannot be sold in that store, it is put on sale to clear inventory and earn some (but less) money than expected. In areas with several stores close to each other, garments can be moved around, rotating the inventory to keep the value as long as possible. After these measures, unsold goods are sent to the depots.

4.2.5 Re:furbish
Re:furbish is identified among several actors in the form of a reinforced concept marketed to the consumers through dedicated areas in the retail environment, or special hangtags in the garments. These items are handpicked either by a selective collection (CB2), sorting of own brand (CB1), sorting of mixed collected material (CO1 and CO2), or by personnel in the retail store (CO3). Re:furbish processes are identified to increase the value of the products and thereby enable the organisations and companies to charge a higher price. CO1 sorts out vintage pieces as well as more unique, fashionable garments of high quality to their ‘Retro’ concept, and sell it in the stores in Gothenburg and Malmö. These garments are priced higher than their regular assortment, and is also repaired or washed if needed.

CO2 has developed an additional sales channel online where they sell vintage garments of better quality. They state that “Historically we have not been so good at selling vintage clothes in our stores so the idea was born to launch an online store to increase exposure.”. The sorted garments are sent for inspection, where it is decided which ones are suitable for the webshop5. The Gothenburg store in CO3 can be interpreted as a niche store, due to a staff-run re:furbish project. The staff, in compliance with the head office, handpicks vintage and more fashionable garments from the deliveries and display these on a separate floor. However, this concept is “[...]more locally run than nationally run.”. Further, CO3 have initiated a project together with the retailer Indiska, called ‘Fight for Change’. This collaboration is an

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alternative sales channel for the organisation to reach new target groups, and to extend their core business and mission to reuse.

CB1 and CB2 are self-reliant in their projects, except that CB1 uses a third party logistics provider between stores and the warehouse. The concept in CB1, ‘Vintage’, is one of the outlets for their take-back program. The garments are distributed from their warehouse in Uppsala to 7 selected stores. Every year, approximately 800 used garments are sold and since the project started almost 5000 garments have been resold. CB2 sells collected outdoor products through their concept ‘Swapstories’. The idea behind the concept came from two employees as an assignment during education at the Sustainable Fashion Academy. The concept is marketed through the stories that these outdoor products have experienced in order to increase the value. The price of the product is decided between the first owner and the retail staff, and is based on the quality, demand as well as the appeal of the story.

CB2 sells between 300 and 400 products every year in ‘Swapstories’, however a precise number cannot be given as it is separated from their regular sales. The money is donated directly to the charity organisation ViSkogen, instead of registering the purchase, as the products would have to be taxed. CB2 notes that the different stories give different impacts on the price of the product, for example the garments formerly worn by their famous brand ambassador are more demanded and therefore priced higher. This is a concept that CB2 wants to develop to incorporate more stores to differentiate and communicate responsibility, however the number of donations is relatively small and they have encountered resistance among external retailers.

Under ‘Fight for Change’, CO3 sells jeans for a unified price in the retailer’s stores with a special hangtag communicating the concept “And it actually sells good [...]”. The concept is considered a win-win for both parties, as the jeans are a complement to the retailer’s assortment. CB1’s concept is communicated inside the garments, in store and by displaying the products in a dedicated corner of the store. Further, the garments are labelled with ‘Bra Miljöval’ (Good Environmental Choice). However, they see a limitation “[...in the number of garments handed in by consumers.”. CB1 identifies large gains from reuse in their ‘vintage’ concept compare to if the material were to be recycled.

4.2.6 Re:couple
The only case working regularly with redesign identified to this level is CO1, “And it is not really to any large extent.”. They make simple changes to garments such as cutting slacks and jeans to shorts, shortening skirts and dresses, and making tank tops from t-shirts. These are considered profitable redesign activities, whereas more complex processes are not, due to the lack of scalability. Re:couple processes achieve value creating changes but still enables volume, which is emphasised by CO1. Furthermore, CO1 has also experimented with more complex re:couple activities, once dedicating one of their city stores to redesigned garments made by their employees and people in the workplace training and daily activities program. However, they concluded that the project required a lot of resources and inventory space.
“ [...] they had worked on this for maybe half a year, and that enabled a little volume.”. Simple changes are highlighted also by CO4, who as a part of the Re:Textile project are planning to take help from a designer to educate employees and volunteers in how small adjustments can be made in-stores to easily freshen up or upcycle a garment to increase value.

In addition to this, CO1 and CO3 produce simple tote bags, which are sold in their stores. CO1 states that redesign of single garments is a “ [...] too demanding process [...] it must be super-simple things like, we make these cloth bags.”. These simple bags can be produced by people in the organisation’s daily activities program, and the simple construction enables volume. CO3 have not sold any redesign products in their stores, besides from the tote bags. Also CO2 has approached redesign through producing bags from torn jeans in the end of the 1990’s, but state that “[...] it doesn’t give anything in relation to time, personnel and equipment that you need to invest in.”. Instead, it has been a measure when there is someone available with sewing skills, and if there has been an interest for it. However, their impression is that revenues cannot be improved by such activities.

4.2.7 Re:construct
CO4 performs re:construct on a disorganised level, where initiatives are taken at some local associations based on the interest among volunteers. The products are sold in the store that is connected to the local association. Other redesign projects are performed in collaboration with prisons in Sweden. Furthermore, CO4 will produce a redesigned collection in collaboration with a designer experienced in redesign in the Re:Textile project. CB1 performs re:construct from collected garments and make rag rugs, covers for stools, benches and pocket linings for chinos among other things. In this, they are dependent on collaboration with external designers and manufacturers for this competence.

RB2 performs re:construct activities in one of their product groups. The idea was initiated in Studio Re:Design and continued after the project. RB2 works with both a manufacturer to produce fabric from the PCTW and a bag producer for the manufacturing of their products. Both RB2 and RB3 rely on the fabric supplier being a social manufacturer as the final retail price will otherwise be too high. Further, RB2 collaborates with agents and showrooms for sales and PR, as well as retailers and an online shop. RB1 and RB3 do not perform re:construct on a regularly basis. Instead, they work in projects and with workshops to communicate new ways of thinking about design “[...] it’s very much about informing and raising the issue.”. RB3 aims to work as a consultant for companies to help with their surplus materials, rather than producing redesigned products of their own. For the products that are produced by redesign brands, charity organisations are currently the only suppliers of raw material.

CO4 are considering a new type of sales outlet for their re:constructed products “[...] it would be fun if we could be unique in that area [...]”. Reflections from previous projects concerns the issue of where to sell the redesigned garment (that had been designed by an external designer). The products became too expensive to sell in CO4’s own second hand stores. CO3
also emphasise a dedicated sales channel for redesigned products because the consumers expect a low price level in their second hand stores. At CO1’s sorting facilities, there has been discussions about redesign, however besides the lack of participants with the right competences, they state that it is difficult for them to sell higher priced garments in their second hand stores due to the consumer expectations.

Conditions for engaging in redesign activities requires “[...]that you put a lot of time into it” and that there is a possibility of reorganising the production to fit a redesign process. RB2 finds that redesign is not very profitable in relation to the time effort. Further, they identify several obstacles, especially in the logistics operations and management of the process. It requires a great deal of micromanagement which “[...]doesn't feel very feasible [...]”. In order to work with production from PCTW, RB1 states that a charity must be the driving force in the project, to develop products for sale in their own stores. They identify difficulties in working together with charity organisations due to the lack of governmental support and resources. However, they state “If there would be environmental investments to develop their operations there would be limitless things to do.”

To capture a unique value through the history of the garments and communicate this value is emphasised by CB1, CB2, RB1 and RB3. CO4 also discusses the importance of understanding the value of available textiles, and has been lecturing their volunteers on this topic. Two of the redesign brands use design as a communicator and means for change in society where the product itself is not as important as the message it carries. This understanding is necessary for the success of selling redesigned products. RB2 want to communicate a message through their redesign bags “[...]but it hasn’t come through [...] the press is not especially interested in it anyway they are only interested in products.”. The redesigned lamp made by RB3 is also a tool for spreading a message “[...]everyone can see that it’s jeans and everyone can reflect upon the source of the material [...]”.

Only one out of four charity organisations perform re:construct activities within their organisation, the others do not perceive any profitability at present due to the highly complex process. The reason for redesign to be given as much attention in CO4 is due to the interest from higher management, especially the interviewee of the study. However, CO4 is still experimenting within this area and no strategic decisions have been made. Majority of the charity organisations state that redesign needs to be run by someone else, while redesign brands express the need for charity organisations to develop this model. One of the main problems identified by the cases is that redesign products need to be priced very high due to the timely and labour-intensive process. RB3 has experienced a resistance to pay more for redesigned products “[...]they do not understand the other values that are present [...] everybody think in money [...] because that is how we are raised.”.

There is an identified issue in whether there is a demand or target group for redesigned products. CO1 chooses not to work with redesign because it requires skilled designers in order to produce products that are attractive and saleable. Moreover, CO1 emphasises that everything that is donated to them is already unique and that volume is a critical issue,
“[...]you need to rethink every time almost [...] That process is much more complex [...]”. RB1 and RB2 spot an interest for redesign products but are uncertain about the demand. RB3 see a preconception among people towards redesigned products that they are perceived as not very trendy. Hence, in order to change that mindset, a high degree of design is required.

CO1 stresses the difficulties in rationalising the reverse design process, which is a barrier to implement a re:construct activity. This necessitates the simultaneous planning and design of product, process as well as the supply chain network. RB1 identifies PCTW as the most difficult waste to work with “Because it’s so shifting.”, hence the design process needs to be reassessed every time. However, RB2 is approaching a rationalised line production through a design idea that allows for slight variations in the material and simplifies the process. In their recent project using PCTW as raw material, RB1 wanted to explore the waste as a basis for line production.

4.3 Antecedents of value creation: Empirical framework
All antecedents under the heading for Reuse are also applicable to re:furbish, as it builds on having reusable items. Also re:couple which is mentioned in Table 6 builds on the key enablers for reuse and re:furbish, since it is based on the idea of simple changes that do not affect the basic construction of the garment. In addition to the generic antecedents presented in Table 6, some antecedents were specific to only some of the cases or categories of actors. These category specific antecedents are presented in Table 7.
<table>
<thead>
<tr>
<th>Value creating activities</th>
<th>Antecedent</th>
<th>Evident cases</th>
<th>Key enabling attributes</th>
<th>Best example from interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collection</td>
<td>Logistics architecture</td>
<td>CO1, 3, 4, CB3</td>
<td>Internal/external logistics operation</td>
<td>&quot;[...]one of the big actors is us [...] who’s got the possibilities and logistics and who has the experience.” - CO1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CO1, CB1, CB2</td>
<td>Consumer involvement</td>
<td>&quot;Without the consumers’ engagement the whole concept falls apart.” - CB1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CO1, 3, 4, RB2</td>
<td>New channels – event collection</td>
<td>&quot;[...]in workplaces and schools [...] there we think that people would not throw away anything [...] and then we’ll get the better quality from there.” - CO4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CO1, 4, CB1, 3</td>
<td>Convenience</td>
<td>&quot;It should be easy. We humans are lazy and have a lot of routines,” - CB3</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Logistics architecture</td>
<td>CO1, 3, CB1, 3</td>
<td>Communication of concept</td>
<td>&quot;That we have a concept that is clear for the consumer [...]” - CB1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CO1, CB1, 2</td>
<td>Increasing number of donors</td>
<td>&quot;[...]there is a growth in this industry [...] both in terms of the number of donors and the number of consumers [...]” - CO1</td>
</tr>
<tr>
<td></td>
<td>Supply chain network</td>
<td>CO3, 4, CB1, 2</td>
<td>Incentive</td>
<td>&quot;[...]the donor understands that when you donate to us you don’t only get an environmental gain.” - CO3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CO1, 2, 3, CB2</td>
<td>Partnerships with retailers</td>
<td>&quot;[...]especially with clothing companies who don’t sell the cheapest clothes. The economy for us is to take care of that which is of high quality [...]” - CO1</td>
</tr>
<tr>
<td>Sorting</td>
<td>Logistics architecture</td>
<td>CO3, CB1, 2</td>
<td>Selective collection</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Supply chain network</td>
<td>CO1, 3, CB1, 2</td>
<td>Expertise in sorting and valuation</td>
<td>&quot;[...]there is a whole lot of down right broken garments and there we don’t have any deposition [...]” - CO3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CO1, 2, 3, CB1, 2</td>
<td>Fibre recycling actor</td>
<td>&quot;[...]prising goods is a science so you need to be very good to see that this shirt we can charge 125 SEK for and this one we can charge 50 SEK for.” - CO1</td>
</tr>
<tr>
<td>Repair/ washing</td>
<td>Supply chain network</td>
<td>CO1, 2, 3, CB1, 2</td>
<td>Internal/external competences</td>
<td>&quot;[...so far there are limited possibilities [...] to recycle synthetic fibre is for example not possible in Europe.” - CO3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CO1, 2, 3, CB1, 2</td>
<td>Internal/external equipment</td>
<td>&quot;Reparations are performed when necessary (with the help from tailors if it’s needed)” - CB1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CO1, 2, 3, CB1, 2</td>
<td>Perceived profitability</td>
<td>&quot;[...]we wash all the garments we collect [...] the garments are sent to our facility in Uppsala where they are washed and distributed [...]” - CB1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CO1, 2, 3, CB1</td>
<td>Perceived profitability</td>
<td>&quot;[...]when we receive [...] designer garments [...] and they are a little dirty or just have a stain [...] we do it. So there are a few machines running each day [...]” - CO1</td>
</tr>
<tr>
<td>Reuse</td>
<td>Logistics architecture</td>
<td>CO1, 3, 4, CB1, 2</td>
<td>Logistics for recovery processes</td>
<td>&quot;[...]we don’t do everything at the same place, first it comes to the production facility where we have expertise in sorting and valuation, and what the store will receive is a saleable product.&quot; - CO3</td>
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<tr>
<td></td>
<td></td>
<td>CO1, 3, 4, CB2</td>
<td>Consumer orientation</td>
<td>&quot;[...]how do we meet the consumer demands and needs? That’s ultimately what enables us to have a sale.&quot; - CO3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CO1, 3, CB1</td>
<td>Strategically segmented stores</td>
<td>&quot;[...]riching could be one way. Instead of all stores looking almost the same. It’s simply sales strategy.&quot; - CO3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CO3, CB2</td>
<td>Competences among retail staff</td>
<td>&quot;[...]the value of the product is determined between the retail staff and the one who hands it in, because the retail staff have knowledge about the interest and the value of the product on the market.&quot; - CB2</td>
</tr>
<tr>
<td>Product architecture/design</td>
<td>CO1, 3, CB1, 2</td>
<td>Quality and design in the first design phase</td>
<td>&quot;[...]better products needs to be put on the market to achieve better handling in further cycles.&quot; - CO3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CO1, 3, CB1, 2</td>
<td>Dry, clean, whole</td>
<td>&quot;[...]if the garments are to be saleable it’s a precondition that they are washed, whole and clean.&quot; - CB1</td>
</tr>
</tbody>
</table>

| Re:Furbish | Logistics architecture | CO1, 3, CB1, 2 | Dedicated area for display in store | "We have our two city stores [...] they get what we call ’retro’, which is both the really old stuff but also more fashionable [...] we charge a little more for those things." - CO1 |
|            |                        | CO3, CB1, 2      | Communication of concept in garment and store | "[...]The Boomerang Effect is communicated in the garment in-store and through display of ’vintage garments’ in a defined area.” - CB1 |

| Re:Construct | Logistics architecture | CO4, CB1, RB1, 2, 3 | Internal/external production resources | "Competence and network with actors who can take an active role in the redesign process, both in design and production [...] and who creates an interest for these type of products.” - CB1 |
|             |                        | CO2, CB1, 3, RB2  | Dedication of time | "[...]you think about how much time you have dedicated [...] then surely it is not very profitable [...] it also depends on how you calculate your own working hours.” - RB2 |
|             |                        | CO1, 4, CB1       | Interest and competence among staff | " [...]it must be skilled designers. Not anyone can redesign a garment and believe that they will be saleable [...]” - CO1 |
|             |                        | CO4, RB1          | Interest from top management | " [...]that we decide in the organisation, that we will maintain this. Why this is taking place is because I’m so interested in this.” - CO4 |
|             |                        | CO1, 4, RB1, 2    | Consumer demand for redesign | " [...]there is a big interest there, but then it’s gonna be distributed to the consumer as well, we’ll have to see what they think.” - RB2 |
|             |                        | CO1, RB1, 2       | Flexible product design | " [...]because the design process is reversed. This is the material we have, what will it be?” - RB2 |
|             |                        | CO4, RB1, 2, 3    | Communication of intrinsic values | " [...]it’s not only the monetary value but you also need to highlight the other values,” - RB3 |
| Supply chain network | CO1, 4, RB2, 3 | Cheap labour for financial viability | " [...]a social activity [...] many of them might not have any textile background at all [...]” - RB2 |
| Collaboration |                        | CO3, 4, CB1 | External competences in redesign | "It’s those kinds of collaborations that we want, we think alike,” - CO4 |
| Product architecture/design | CO4, CB1, RB1, 2, 3 | Dry, clean | " [...]especially if we are to up-cycle it [...] then it’s required that the textiles are washed.” - CO4 |
|             |                        | CO1, RB3          | High degree of design | " [...]people in general have a preconception towards reuse, you think of the 'homemade' [...]” - RB3 |
|             |                        | CO4, RB2          | Trend factor for commercialisation | " [...]it’s some kind of taste that decides [...] for most people. What we wanted to do was to make products that fell under that trend factor.” - RB2 |

**Table 6.** Empirical framework: Generic antecedents
<table>
<thead>
<tr>
<th>Value creating activities</th>
<th>Antecedent</th>
<th>Evident cases</th>
<th>Key enabling attributes</th>
<th>Best example from interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collection</td>
<td>Logistic architecture</td>
<td>1, 2, 3, 4</td>
<td>Multiple collection channels</td>
<td>&quot;We have developed the collection activity, we have collaborated with fashion retailers [...] and more [...] with Ragn-Sells [...]&quot; - CO3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>Close to sorting facilities</td>
<td>&quot;[...] there shouldn’t be so much transports [...] we have a warehouse facility in Gothenburg and Malmö so that we are close to the collection points.&quot; - CO1</td>
</tr>
<tr>
<td></td>
<td>Collaboration</td>
<td>1, 2, 3</td>
<td>Municipality labour departments</td>
<td>&quot;[...] they help us in many places, both in collection, sorting, pricing [...] every day there is around 200 people engaged [...]&quot; - CO1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2, 3</td>
<td>Housing companies</td>
<td>&quot;[...] then you form the collection along the conditions in the various places [...] it’s a growing channel.&quot; - CO2</td>
</tr>
<tr>
<td></td>
<td>External</td>
<td>1, 2, 3, 4</td>
<td>Permission from municipalities</td>
<td>&quot;We notice that we have to work extra hard to get permissions in certain municipalities&quot; - CO3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1, 4</td>
<td>Regulations</td>
<td>&quot;[...] it’s insane that there is not better regulations for the municipalities to relate to, there hasn’t been any coherence in who can collect. It looks different in all the municipalities.&quot; - CO4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1, 2, 3, 4</td>
<td>Standards and certifications</td>
<td>&quot;[...] there has been organisations who does something else than what they claim to do.&quot; - CO5</td>
</tr>
<tr>
<td>Clothing brands</td>
<td>Logistic architecture</td>
<td>3</td>
<td>Impact during purchase moment</td>
<td>&quot;[...] in that moment when you purchase, we have a pretty strong impact on the consumer.&quot; - CB3</td>
</tr>
<tr>
<td></td>
<td>Supply chain network</td>
<td>2</td>
<td>Supplier take-back</td>
<td>&quot;[...] the dilemma is that Teijin do not take back used products [...] the closed loop is more of a theory rather than a practical possibility.&quot; - CB2</td>
</tr>
<tr>
<td></td>
<td>Collaboration</td>
<td>3</td>
<td>Charity organisation as receiver</td>
<td>&quot;[...] it goes to the Stadsmissionen [...] to their already existing infrastructure.&quot; - CB3</td>
</tr>
<tr>
<td>Sorting</td>
<td>Logistic architecture</td>
<td>2</td>
<td>Holistic concept for deposition</td>
<td>&quot;[...] it can be very difficult to find some sort of economy in managing the remainders [...] you need a holistic concept if you want to collect unspecified qualities.&quot; - CO2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1, 3, 4</td>
<td>Flexible processes</td>
<td>&quot;[...] what the consumer wants should be in the store, but that’s where you need to work with your processes to really be able to manage it [...]&quot; - CO3</td>
</tr>
<tr>
<td></td>
<td>Collaboration</td>
<td>1, 3, 4</td>
<td>Competence development</td>
<td>&quot;What hinders is that the labour we have in the sorting [...] doesn’t really keep up with the fashion trends.&quot; - CO4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1, 2, 3</td>
<td>Municipality labour departments</td>
<td>&quot;[...] it might be helpful for catalyst to get the data from [...]&quot; - CO4</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Reuse:Charity organisations</th>
<th>Logistic architecture</th>
<th>1, 2, 3</th>
<th>Throughput</th>
<th>&quot;You can’t save that much, the big gain for us is to sell in the stores, that’s when we feel we do the most good because then we get some volume.&quot; - CO1</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>3, 4</td>
<td>Sale strategies</td>
<td>&quot;The same way as H&amp;M are working with sales, we have to work with sales, 3 for 2, added sales at the registers and better displayed stores [...]&quot; - CO3</td>
<td></td>
</tr>
<tr>
<td>Collaboration</td>
<td>1, 2, 3</td>
<td>Municipality labour departments</td>
<td>&quot;[...]we can see that the demand is increasing and there is a huge interest.&quot; - CO1</td>
<td></td>
</tr>
<tr>
<td>Collaboration</td>
<td>1, 2, 3</td>
<td>Increasing consumer demand</td>
<td>&quot;[...]we can see that the demand is increasing and there is a huge interest.&quot; - CO1</td>
<td></td>
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</tbody>
</table>

| Re:Furbish* Clothing brands | Collaboration | 2 | Ambassadors | "We see that when we have for example Ola Skinnarmo [...] it’s of course a bigger pressure on those things [...] they are valued much higher and they often sold immediately [...]" - CB2 |
|                            | Product architecture/design | 2 | Competence development | "The idea came from two employees who went for education at the Sustainable Fashion Academy [...] - CB2 |
|                            | Product architecture/design | 2 | Storytelling | "Often the products have experienced [...] exciting adventures that can be interesting for others too [...] some products that has experienced special things are valued higher [...]" - CB2 |

| Re:couple Charity organisations | Product architecture/design | 1 | Simple changes —> volume | "[...]if you cut off sleeves and legs and make shorts out of the jeans [...] that’s a simple thing" - CO1 |
| Redesign brands              | Logistics architecture     | 1, 2, 3 | Secured access to material according to specification | "[...]if there would suddenly be someone saying ‘we need 200 bags’ that would be sweaty. It’s a huge key.” - RB2 |
|                            | Supply chain network       | 2 | Micromanaging | "[...]when we match the materials [...] that these should be put together [...] later someone else can do it [...] but right now it’s pretty good.” - RB2 |
|                            | Collaboration              | 1, 2 | Marketing/PR | "[...]and we have a showroom, Skobranschrädets showroom [...] the bags have been really popular in the press [...] - RB2 |
|                            | Collaboration              | 1 | Project owners | "[...]if they decides to have something ‘that we want to sell in our stores’, so they initiate a project that they manage.” - RB1 |

Table 7. Empirical framework: Category specific antecedents
5. Analysis and discussion

This chapter reflects upon the empirical framework in relation to the propositions made in the theoretical framework in order to answer to the research questions. It starts by discussing the identified generic antecedents in relation to the literature, followed by a similar discussion of the category specific antecedents found. The analysis and discussion is ended by a chapter of concluding reflections drawing from insights of the study.

The Resource Based View is the underlying theory of research in value creation, however the perspective is perceived limited in terms of its objective to create competitive advantage as a means for economic value creation (Bowman & Ambrosini 2000). The objective of business today needs to be broader in terms of the value it creates, in accordance with the stakeholder view (Mathur & Kenyon 1997). Value creation through reverse logistics answers to several stakeholders, as it creates economic, ecological and in the case of charity organisations social value by their workplace activities and re-investments in society. Also clothing brands have realised the potentials of reverse logistics as a solution to the increased demands for a stakeholder perspective, using it as an extension of their corporate social responsibility. In this study, two of the cases had even made the decision to not appropriate any economic value at all by their engagement in reverse logistics, to the benefit of charity organisations. One of them stated that the environmental perspective is also a business perspective as it affects the conditions for making business in the future.

Reverse- and forward logistics are treated as separate areas in research, however the principal of value creation is the same; innovation, production, and delivery of products (Brandenburger & Stuart 1996; Mizik & Jacobson 2003). A product is created through logistics operations and needs marketing and proper sales channels and service to create economic value (Porter 1985). CO3 especially emphasises working according to a more conventional business model, where all the collected material is sent to a ‘production facility’ and processed before sent out to the stores. The difference between reverse and forward logistics is the new conditions of the raw material; the properties and quality of the material and uncertainty about the volumes (Jayaraman & Luo 2007). PCTW is the most difficult material to work with in a reverse textile value chain, as emphasised by RB1, and therefore requires new ways of thinking and planning regarding value creation.

The identified network of actors managing PCTW in Sweden can be perceived as a *value network* (Garza & Dedehayir 2012). This value network contributes to the creation of societal- and environmental value as a whole, by diverting textiles from the waste stream and thereby reducing incineration of textiles. Further, they supply each other with expertise and material and hence depend on each other for their respective processes.

### 5.1 Antecedents

Findings from the interviews reveals both generic and category specific antecedents to perform the identified value creating activities. The generic antecedents are discussed by
several cases regardless of the category they belong to, while category specific antecedents are dependent on the operating environment and strategies of the different actor types. Majority of the category specific antecedents are not mentioned by the literature studied, but are however important to understand the different activities within value creation from PCTW. The theoretical framework was built partly on research of charity organisations, as they are the main actors within the field. After analysing the frameworks, it could be concluded that some of the antecedents were therefore not applicable to all actors studied through the cases.

5.1.2 Generic antecedents

5.1.2.1 Collection

The main objective of collection is to allocate raw material of sufficient volume for further recovery processes. Volume is not defined as a key-enabling attribute, however it is the ultimate goal of the other identified attributes in collection. The theoretical framework suggests volume and consistent flow of raw material as an enabler for value creation, in order to achieve cost efficiency (Wang 2010; Ekström & Salomonsson 2014; Jayaraman & Luo 2007). Several key enabling attributes are found under collection, referring to the possibility of collecting sufficient volumes for the further activities. Increasing number of donors is the main determinant to collect volume. One of the charity organisations identifies an increase in the number of donors, while two of the clothing brands state the lack of donors as a hindrance from increasing their amounts of garments sold.

Internal/external logistics operation is found in the evident cases as a basic requirement for collection in order to retrieve used products from donors, and initiates the process of creating new use-values (Brooks 2012). The logistics operation is considered one of the core competencies in CO3, while the collection scheme initiated by CB3 builds entirely on the availability of a third-party logistics provider. The planning of logistics operation for collection is an integral part of the reverse value chain strategy, which answers to difficulties in predicting the amount and quality of returned products (Jayaraman & Luo 2007).

New channels – event collection is identified to enable more volume by collecting closer to the donor and reaching new target groups. Event channels such as workplaces and schools are mentioned, not only as a way to come closer, but also a means to collect more garments of higher quality. This is not acknowledge in the literature, and thus represents a creative mindset within the collecting organisations. This is proven by both charity organisations extending their collection schemes, as well as one redesign brand suggesting collection among family and friends.

Consumer orientation is emphasised by all evident cases when planning the location of collection points. It is essential to understand the lifestyle of consumers (MacMillan & McGrath 1997) in order to provide collection schemes that are convenient. Convenience is highlighted in the interviews as an important attribute to facilitate the donation of clothing
with collection points that are close to the consumer and preferably within their daily routines. To make it convenient for the donors, *new channels* for collection might be introduced.

Further, *convenience* is related to *communication of concept*, which discusses the need to inform the donor on how to donate. Consumer information and convenience is mentioned in the literature as critical factors to get consumers to participate in collection schemes, and hence to create *consumer involvement* (Ekström & Salomonsson 2014, 2012; Morley et al. 2009). The donor is the starting point of the value chain, the supplier of raw material (Zikmund & Stanton 1971; Krikke et al. 2004; Östlin et al. 2008), and therefore needs to be included in the supplier relationship management schemes. Here, *convenience* is based on lowering the donors opportunity-cost, the effort of donating, which is the aim of creating close supplier relationships (Brandenburger & Stuart 1996).

*Consumer involvement* is emphasised in both theory and practice, where it relates to the consumers’ role as a supplier. This is the most fundamental aspect of the reverse value chain because without it, there would be no access to material. The *consumer involvement* have been developed by charity organisations under a long time. Clothing brands, that are new to collection, also emphasise the involvement of the donor as a critical step to perform their activities. Due to their small scale of collection, every garment is of highest value. To encourage the donors, *incentives* of different kinds are given. Clothing brands offer economic incentives and charity organisations emotional incentives. The collection schemes of clothing brands have been identified as new competition to charity organisations in collection, stated both by Tojo et al. (2012) and the organisations in this study.

*Partnerships with retailers* are initiated or planned for in the future by the evident cases to increase the volumes as well as the collection of higher qualities. This is evident in the theoretical framework where *cooperation with downstream actors* is suggested as a critical issue to manage the timing, quality, quantity and composition of collected material (Jayaraman & Luo 2007; Krikke et al. 2004). One example is CO1, who expresses desire to initiate such donation partnerships (Ekström & Salomonsson 2014, 2012) with retailers of higher price/quality segments.

There is an emerging competitive environment in collection between charity organisations and clothing brands. At the same time, increasing attention is put to collaboration between the two actors, stated by Tojo et al. (2012). For the clothing brands, collection is an opportunity to extend their corporate social responsibility, while for charity organisations it is a means for increased volumes and better qualities. CB2 emphasise *partnerships with retailers* as a determinant for their ability to collect larger volumes, since they do not own their stores. In order for them to increase collection rates, they express the need to further deepen the relationship with their closest partner stores.

### 5.1.2.2 Sorting

*Selective collection* is highlighted in the interviews and relates to the need for *strategic collection*, stated in the theoretical framework. *Strategic collection* is referred to as the
separated collection of worn/ragged textiles from the collection of reusable garments for charity organisations (Ekström & Salomonsson 2012). The need for a strategic collection is apparent in the interviews with the charity organisations with regards to the amounts of non-valuable waste that they are forced to handle. CO3 is approaching this through a new communication for collection called ‘Torrt & Rent’ (Dry & Clean). Both CB1 and CB2 have a strategic collection, both in terms of collecting their own brand, and what condition of the garment is accepted.

Sorting requires expertise through skilled labour (Bowman & Ambrosini 2000; Brooks 2012; Tojo et al. 2012; Hawley 2006) in order to provide saleable quantities and thus maximise the value of collected materials. Expertise in sorting and valuation and the theoretical proposition of differential labour (Bowman & Ambrosini 2000) are related as the sorting process provides one of the main points of differentiation for charity organisations. This is evident in CO1, CO3 and CO4 who put a great effort into competence development by educating the employees. In CB2, the expertise in sorting and valuation concerns the market knowledge among the employees to price the garments accepted for their re:furbish concept.

The lack of fibre recycling actor is discussed by five of the ten cases as a critical issue in planning the deposition of non-usuable garments. The literature review is partly based on research from other industries, where recycling of materials is a viable option at the end of the user phase. However, these possibilities are limited in the textile industry in terms of a close-by alternative, as well as the separation and recycling of certain material blends. Figure 3 in the theoretical framework visualises a closed loop system with recycling (Kumar & Putnam 2008), which is stated by CB2 to still only exist in theory due to the issues of recycling textiles. CO1 states a lack of deposition for broken garments, due to the absence of a rational recycling system.

5.1.2.3 Repair/Washing
The literature review does not highlight specific antecedents for the processes of washing or repairing garments intended for reuse or redesign. Evident cases points out internal/external competences and internal/external equipment as key enabling attributes for repair and/or washing. CB1 outsource tailoring when needed and CO4 is discussing the possibility of contracting an external laundry service provider. For the charity organisations, the collaboration with municipal labour departments as well as dependence on volunteers affects their availability of competences. Due to this, there is a disagreement among the cases regarding the value creating potential of repair/washing processes. CO1 and CO4 see that it definitely increases the value of certain products, while CO3 consider it to reduce the environmental gains and CO2 do not see profitability at all. Perceived profitability is therefore a key enabling attribute of the processes in repair/washing, and is discussed by all evident cases in terms of contributing or not contributing to added value in the product.
5.1.2.4 Reuse

The literature emphasises the importance of logistics operations in reverse value chains, which is highlighted in the context of reuse during the interviews. In order to sell reused garments, they need to be collected, sorted and possibly mended (Ekström & Salomonsson 2014; Brooks 2012), between which efficient logistics is needed. Logistics for recovery processes is expressed by CB2, who states that if there was a rational logistics chain for product recovery they would be able to do more. Moreover, the widespread collection points and separation of production and retail operations among the charity organisations, necessitates well-planned and efficient logistics operations.

Planning assortment is suggested by Tojo et al. (2012) as an important enabler for retailing of reused garments, which requires consumer orientation. This enables differentiation for the firm as a strategy to better meet consumer demands and needs (MacMillan & McGrath 1997). In the evident cases, the need for differentiation is apparent through strategically segmented stores. The segmentation needs to be based on sound knowledge about the target groups at different locations, according to which the assortment for the stores is planned.

Strategically segmented stores is discussed as an integral part of CO1’s retail strategy, in terms of the city stores who offers a special segment that allows for a higher price to be charged. In CO3, a strategic segmentation is not yet practiced but is considered as a way to better meet future consumer demands. However, some of CO3’s stores can be perceived as strategically segmented due to competences among retail staff in visual merchandising, emphasised by Tojo et al. (2012) as a necessity for successful retailing of reused garments. Competence among retail staff further includes the selection of garments that are accepted for take-back by retail staff at CB2, which also requires consumer orientation. Their competences in valuation, and familiarity with the market (Tojo et al. 2012) regarding the interest for certain garments allow them to have a saleable assortment in store. Hence, market demand is an important determinant of which garments to collect (Krikke et al. 2004).

The availability of second hand garments of sufficient quality for resale in Sweden is a basic requirement for a reuse activity. This is emphasised in the literature by Ekström & Salomonsson (2014) and Go et al. (2015) who argue that design for multiple generation product life-cycles in the first design stage and thus longevity, enable garments to have a second lifecycle. Furthermore, Umeda et al. (2012) argues that there is a need for simultaneous product- and process design planning in the very first design process. This is not brought up in the interviews, however, the importance of quality and design in the first design phase is highlighted in both charity organisations and clothing brands. CO3 and CB1 stress the importance of design that aesthetically lasts over time, and further extended by CO3 to include volume. CB2 have a product that requires high quality in the first design phase, which enables them to create value in a second lifecycle.

Dry, clean, whole is a necessity for the garments to be saleable, which is emphasised by CO3, CB1, and CB2. This relates to strategic collection (Ekström & Salomonsson 2012; 2014, Tojo et al. 2012) in terms of being selective. However, CB1 chooses to wash all of the collected
garments despite the requirement on the collected materials. Furthermore, marketing is an important enabler to promote retailing of reused garments (Tojo et al. 2012). This is not discussed by any of the actors in terms of reuse, however it is mentioned in relation to the re:furbish concepts.

5.1.2.5 Redesign

It is not possible to separate the antecedents of redesign in the theoretical framework into the different levels suggested by Carlsson et al. (2014) due to a lack of research. However, there is a difference in strategies within the levels where even production resources will differ. The empirical study allow for a separation of antecedents into the three levels based on the concepts and descriptions from respondents. The interviewees discuss redesign in terms of either reusing garments within a specific concept (re:furbish) or as a very complex process (re:construct). In-between strategies are not mentioned accept from CO1, where a re:couple strategy can be identified due to simple changes such as cutting of jeans to shorts. Hence, the largest lack of research is for re:couple. The activity has the same requirements as the two other levels, but more or less than the others.

5.1.2.5.1 Re:furbish

In addition to the key enabling attributes identified for reuse, re:furbish concepts require some further aspects. Re:furbish in the cases is performed solely as a marketing concept with no physical intervention of the garments apart from repair when needed and washing. Hence, no further physical additions are needed to the garments in addition to hangtags for communication of the concept in garment and store, and a dedicated area for display in store. Re:furbish concepts in the cases thus relate more to emotional appeals than physical attributes of products.

The communication of concept in garment and store relates both to the need for marketing (Tojo et al. 2012; Carlsson et al. 2014), as well as the branding of concepts through hangtags. Brand building fit with design content (Carlsson et al. 2014), if attractive enough, enables the re:furbished product to be the consumer's first choice before conventional products. The concepts developed by CO1 and CB1 are based on increasing the value of the second hand garments by using concept names that are higher held such as ‘retro’ or ‘vintage’. CO3 uses another approach in their concept at Indiska where they appeal to consumers’ sense of responsibility and willingness to good.

The re:furbish concepts identified among the cases belongs to a dedicated area for display in store, which is a way to separate the garments from the ordinary assortment and augment the concept (Carlsson et al. 2014). The placement of garments in a specified area is contributing to the value of the concept, especially seen in CO3, which can benefit from the external retailer’s strong brand. An indirect value created through this opportunity is the possibility to attract new consumers to the existing reuse business. One of the main concerns among the charity organisations is that the price for redesigned products might be too high compared to the other products in their stores. However, re:furbished products are generally of lower
quality standards (Thierry et al. 1995) and might therefore be sold in the charity organisations’ second hand stores without standing out too much on price. In terms of clothing brands, these products instead contribute to a positive image reflecting sustainable values and an addition that differentiates the retail experience.

5.1.2.5.2 Re:construct

All evident cases outsource their production to manufacturers, except CO4 whose production is taking place within the organisation at a disorganised level. These internal/external production resources are the basic requirement for performing redesign at the specified level. Carlsson et al. (2014) suggests a range of production resources needed to perform re:construct, however in the end, it always depends on the visual design of the product.

The availability of third-party manufacturers enables the line production of products for both RB2 and RB3, as well as the choice of social activities as manufacturers. Cheap labour for financial viability is a key enabler for production in Sweden in order to make a profit, which would otherwise be impossible considering Swedish wage costs. Hence, simple constructions are highlighted among the redesign brands as a key-enabling attribute for the social manufacturers to manage the production. More advanced constructions requires both time and highly skilled labour. For that, there needs to be a visible demand for these kinds of products. Simple constructions would be a condition for all the three actors and others who are considering engaging in re:construct activities in Sweden.

Dedication of time is a discussed issue both among cases performing re:construct, and those who have chosen not to do so. This time aspect is also discussed by Carlsson et al. (2014), in terms of the time consuming and, hence, expensive process. For this reason, time is a determinant for engaging in re:construct activities. Redesign at this level is considered by CO2 to be an unfeasible process as it costs more than they can charge for the products. CB3 merely chooses to dedicate their time elsewhere. RB2 further stresses dedication, rather than just allocation of time, as it is not profitable if the hours spent on the process would be calculated.

For charity organisations and clothing brands, the aspect of a competent designer in redesign activities is contributing to the complexity. There is a need for interest and competence among staff for the activities to be successful. In CO1 and CO4, these initiatives have been launched by employees with interest in design and/or crafts. In addition to time, interest is the main enabler for CB1 to engage in re:construct activities. Expertise in the reverse design process (Carlsson et al 2014), state the need for competence both in terms of design and production. Moreover, in a line production system, this expertise also includes the coordination and logistics operations in planning the value chain. This is further discussed in the specific antecedents.

When internal competences are not sufficient, external competences in redesign needs to be incorporated into the process. This is related to cooperation and sharing of expertise (Kumar & Putnam 2008, Möller 2006) as a key enabler to manage the complexity. Due to this, CB1
depends solely on an external designer for their re:constructed products. Further, CO4 participates in a joint multi-functional development team to expand competences and share expertise through a collaborative product and business process (Möller 2006; Jayaraman & Luo 2007). To integrate a supplier with the right capabilities and knowledge is suggested to increase the effectiveness and product development success (Petersen et al. 2005; Garza & Dedehayir 2012). This is an opportunity that CO4 want to seize. CO3, on the other hand, perceive a value in supplying external designers with raw material and in this way be a part of changing the current ‘wear and tear’ mind-set.

The main reason for the charity organisations not to engage in redesign is their need for a fast return on investment to provide economic resources to their charitable operations. Hence, there is an aspiration to turn the collected material into money with as few interventions as possible. RB3 evidences capital for persistence (Carlsson et al. 2014) as an enabling attribute in discussing the general fast paced business environment in regards to return on investments. CO4 also point to the economy as a critical issue, met by experimenting in projects before taking major decisions. Two evident cases suggest that interest from top management is a key enabling attribute to engage in re:construct activities, which is a precondition to invest capital for persistence. In CO4, this is proven by the very personal engagement from the interviewee to develop redesign as a complementary activity to the second hand business. RB1 considers the lack of interest from top management to be a critical issue that led to the termination of their project before reaching production.

The lack of proof for consumer demand in redesign in combination with the costs and time attached to it, makes this activity a risky investment. Carlsson et al. (2014) discuss the market and consumer demand as the most critical aspect for success of redesign. CO1 argue for and prioritise reuse due to the visible consumer demand for that product and price level. Moreover, the investments in re:construct activities at CO4 demonstrates a belief that there is a consumer demand for redesign. It is rather a matter of how and where to reach it.

To motivate consumer to buy re:constructed products, communication of intrinsic values is emphasised by the evident cases as a key enabling attribute. This is seen in RB3, who highlights emotional, visual and environmental values of redesign in contrast to new products that the consumer can relate to. For RB1, this communication is vital to create an interest for the products in the first place. Communication of intrinsic values thus becomes a point of differentiation by separating redesigned products from the conventional products. Hence, it creates the conditions for a competitive advantage (Porter 1985; MacMillan & McGrath 1997). Brand building fit with design content (Carlsson et al. 2014) is similar to communication of intrinsic values as it focuses on delivering intrinsic values to the consumer. CO4 further extends the communication of values to employees, volunteers and so on.

Flexible product design relates to the difficulties in rationalising the reverse design process from PCTW, as it needs to start with the material in hand. The varying properties of the raw material and hence the need to rethink the design in every new process is considered a barrier to implement re:construct activities. However, with a flexible product design that allows for
slight variations of the raw material, a line production of re:constructed products can be approached as proven in RB2 and emphasised by RB1. This complexity is also related to the expertise in the reverse design process (Carlsson et al. 2014), for the designer to see the possibilities of what can be made from the irregular material and plan the chain accordingly.

*Dry, clean* refers to the physical property requirements of the material in order to process it. This is a necessity for further upcycling processes, both stressed by Carlsson (2014) and the evident cases. *Dry, clean* is further related to *disassembly of material and required maintenance* (Young et al. 2004) prior to use by the end consumer.

In order for re:constructed products to be saleable, a *high degree of design* is a prerequisite stressed by CO1 and RB3. The products therefore need to have an equal attractive design and quality standards as conventional products (Thierry et al. 1995; Carlsson et al. 2014; Östlin et al. 2008). A *high degree of design* relates to *good design practice* supported by Young et al. (2004), who argue that the concept of redesign is not fully accepted and understood without it. *High degree of design* is consequently a means for creating *attractiveness compared to conventional products* (Carlsson et al. 2014). Moreover, for the commercial success of re:constructed products *trend factor for commercialisation* is an important attribute proven by CO4 and RB3. This has been discussed in terms of the consumer’s taste as the main determinant in a purchase moment, rather than promoting environmentally friendly production processes. Hence, a *high degree of design* and *communication of intrinsic values* are not sufficient without *attractiveness compared to conventional products* (Carlsson et al. 2014).

### 5.1.3 Category specific antecedents

The category specific antecedents relate to the different core competences among the categories of actors studied.

#### 5.1.3.1 Collection

**Charity organisations**

*Multiple collection channels* is a strategy proven by all evident cases as an enabling attribute to achieve *volume and a consistent flow of material* (Wang 2010; Jayaraman & Luo (2007); Ekström & Salomonsson 2014) As collection is one of the core competencies in charity organisations, the collection schemes are continuously developing to adjust to changes in the market. Collection *close to sorting facilities* is discussed in CO1 and relates to *dense population and closeness to facility* (Tojo et al. 2012), which is an important attribute for the financial viability. The need for a dense population is proven by all the cases as collection in the north of Sweden is not taking place in the same extent as in other parts.

Collaboration with *municipality labour departments* is a necessary attribute in order to achieve cost efficiency from large-scale operations (Wang 2010). This attribute have equal importance in collection as well as sorting, reuse and re:construct for charity organisations. Further collaborations taking place are the ones with *housing companies*. This is a new
channel of growing importance with the aim of providing convenient solutions close to the consumer, seen especially in CO1 and CO2. Household collection is also suggested in the literature by Morley et al. (2009) as an enabler for achieving higher collection rates.

The determinant factor of collection is permission from municipalities, which is also seen in the literature as municipality support for collection (Tojo et al. 2012). The issues regarding the role of municipalities are reviewed in the literature by Ekström & Salomonsson (2012), Palm et al. (2014) and Naturvårdsverket (2013), among others. This is also a widely discussed issue among the cases together with regulations in terms of the lack of regulations for the municipalities to refer to.

Moreover, standards and certifications (Palm et al. 2014) is perceived to provide better collection possibilities, which is also supported by the interviewed cases. This attribute is suggested to provide better transparency and credibility (Palm et al. 2014) and is especially important in regards to the increasing amount of non-legitimate actors. Moreover, a protective collection against contaminated products is emphasised by Morley et al. (2009). This aspect is not discussed among the cases, however the large amount of dirty and contaminated products in collection necessitates a system that protects the material.

Sharing of economic burden in collection and sorting (Tojo et al. 2012) is evident in CO2 by the newly initiated company ReturTex. The platform is supposed for all collecting actors to deposit their unsellable qualities that are currently taking resources from the profitable activities. RB1 and further RB2 and RB3 stress the need for governmental support as a solution to the economic situation at charity organisations.

Clothing brands
None of the following key enabling attributes are identified in the research literature used in this thesis, however highlighted in practice by CB2 and CB3. Impact during purchase moment is emphasised to achieve higher collecting volumes in the new channel developed by CB3. It relates to the previously mentioned communication of concept, and is probable to be used by both clothing brands and charity organisations to promote their collection schemes. Supplier take-back is discussed by CB2 as a reason why they are not able to collect more garments from consumers. This relates to the lack of a fibre recycling actor and better technologies for material recycling, which if evident would enable take-back from suppliers to a larger extent. Instead, charity organisation as receiver is a necessary solution as CB3 do not have the logistics to facilitate the collection.

5.1.3.2 Sorting
Charity organisations
A holistic concept for deposition is discussed by CO2 as a strategy for all collected materials in order to achieve cost efficiency and maximise the profitability. Hence, it needs to be a part of the value chain strategy (Fleischman et al. 2004; Jayaraman & Luo 2007). In order to prepare for a holistic concept and develop deposition channels, familiarity with both the national and international market is needed, emphasised by CO2.
Flexible processes allows agile responses to changing market trends and is important for the charity organisations to be able to compete in the retail industry. It relates to strategic sorting (Tojo et al. 2012; Ekström et al. 2014) which stresses the importance of a selected assortment for the different target groups. It is therefore of highest relevance to identify desirable qualities from all qualities collected. In order to identify these qualities, competence development is stressed by CO1, CO3 and CO4, in order to meet consumer demands. This is further contributing to the development of differential labour stated by Bowman & Ambrosini (2000) as the source of superior profit. Highly developed sorting skills are considered one of the most valuable and unique resources in charity organisations, and hence contribute to competitive advantage (Davis & Kay 1990).

Technology for sorting efficiency (Ekström & Salomonsson 2014) is briefly discussed in the literature, however the cases emphasise the human assessment when identifying saleable garments for their retail operations. Furthermore, a fault in the literature is found stating that exports take place mainly due to high labour costs in Sweden (Carlsson et al. 2014; Palm 2011; Ekström & Salomonsson 2012). Interviews with the charity organisations revealed the vast and irregular inflow of material and limited capacity as the main reason for exports. Moreover, the cases state a gap between consumer demands and the amount of textiles collected as a reason for all exports. Consequently, they only sort enough material to provide their stores with saleable merchandise.

5.1.3.3 Reuse
Charity organisations
Throughput is stressed by CO1, CO2 and CO3 in terms of turning volumes of clothing into monetary value. To achieve a high sell through rate, sales strategies similar to those of conventional retailers are used by CO3 and CO4. Strategies to increase sales of second hand garments are not further discussed in the literature besides the need for visual merchandising (Tojo et al. 2012).

Three of the organisations point to the increasing consumer demand as an important attribute, enabling them to enhance value creation in form of reuse. CO1 and CO3 perceive the demand as undoubtedly increasing, while CO2 notice a large interest in shopping second hand. The interest for second hand is also evident in previous research from Ekström & Salomonsson (2014), Svensson (2007) and Morley et al. (2009). However, the authors state that this positive image towards second hand products needs further reinforcement to increase the overall levels of reuse.

Identification of internal resources (Fine 1998) and specialisation of core competences (Garza & Dedehayir 2012) are discussed as the basis for value creation in any type of firm. This is seen in CO3, who gives much attention to the development of their core competences and at the same time identifying what competences to outsource. Despite not being mentioned in the interviews, this is something that all of them are doing in order to compete in the post
consumer textile industry. Initiatives and attitudes among the interviewees clearly illuminate differentiation as something that they all are addressing.

5.1.3.4 Re:furbish
Clothing brands
The category specific attributes for re:furbish are identified in CB2 and highlights some interesting points of differentiation. Ambassadors are identified as an enabler to charge more for the garments, and thus providing more economic value to their charity partner. This is a common strategy used by fashion retailers in forward supply chains to market garments or whole collections. The ambassadors strategy could be performed either by celebrity donations or handpicked assortments marketed under a specific concept, and should also be considered by charity organisations. Moreover, competence development was the starting point for developing the re:furbish concept in CB2. This proves inspiration and new knowledge as important attributes to implement new business models with potential to increase value creation and is one way of creating differential labour (Bowman & Ambrosini 2000; Brandenburger & Stuart 1996).

Another key enabling attribute in CB2 re:furbish concept is storytelling. Accordingly, the concept is not only dependent on consumer involvement in the collection of the garments, but also by co-creating the value together with the donor who is sharing a memory. The storytelling contributes to an emotional connection between the garment and the new potential owner and consequently leads to a higher value. The storytelling strategy is mentioned by Carlsson et al. (2014) as a way to successfully market redesigned products.

5.1.3.5 Re:couple
Charity organisations
Re:couple is not identified as a regularly used strategy for any of the cases, except CO1. They have implemented a simple form of the strategy, mainly based on cutting garments to change the design and function. The most important attribute of these simple changes is that they provide volume, once again referring to the need for throughput in charity organisations. Hence, simple changes are a way to achieve scalability (Carlsson et al. 2014). Furthermore, CO4 are planning to implement a form of these simple changes in their stores by providing education to their volunteers and employees. Hence, the relevance of this category might be growing.

5.1.3.6 Re:construct
Charity organisations
A dedicated sales channel is required for charity organisation to be able to sell re:constructed products, which is proven in the interviews. CO3 and CO4 refer to the mindset of consumers, who generally expect a low price level in the second hand stores. Hence, to be able to price re:constructed products accordingly with the costs attached, it needs to be sold in a separate channel. Carlsson et al. 2014 suggests a distribution channel and attractive retail experience surrounding re:constructed products in the same extent as new products. Consequently, the
planning of distribution channels needs be coherent with the design (Carlsson et al. 2014). Here, the empirical study provides different requirements on the distribution channel for re:furbished and re:constructed products. The clothing brand working with re:construct, in contrast to the charity organisations, is able to sell their redesigned garments within their regular stores. This is possible as the consumer expectations are different on new products, and especially within strong and attractive brands.

*Competence development* with the help of external actors is highlighted as an enabler for charity organisations to engage more in re:couple and re:construct activities. This mainly takes place in collaboration with experienced designers working with redesign. CO4 evidences this with their planned educations, as well as their desire to collaborate with redesign brands in projects. This is a way for them to learn and experiment before making strategic decisions regarding the implementation of re:construct activities on a larger scale.

**Redesign brands**
The sorting activity is emphasised as critical by the evident cases with regards to how it affects the secured access to material according to specifications. This key-enabling attribute is matched with availability of sorted material as well as the requirement of a suitable quality and properties of collected material (Carlsson et al. 2014; Tojo et al. 2012; Ekström & Salomonsson 2014). Apparently, this is an important key in re:construct activities comprising a difficult element as the redesign value chain does not have a reliable supplier of raw material. Charity organisations ability to provide sorted material according to specification is currently affected by external factors such as the unsustainable pressure of incoming material and a lack of governmental support. Such external factors have a direct impact on the possibilities to create a functioning value network (Garza & Dedehayir 2012).

Moreover, the need for charity organisations to be the project owners is highlighted by RB1, however not agreed by the charity organisations. On the contrary, they think that another party needs to be in charge of the project. Regardless of who is in charge, a re:construct activity requires a collaborative product- and business process to be successful (Möller 2006; Jayaraman & Luo 2007).

*Marketing/PR* for re:constructed products is evident in RB1 and RB2 and is related to communication of intrinsic values and demand management (Carlsson et al. 2014). Further, this attribute is matched to marketing and communication resources (Carlsson et al. 2014) and is especially important when products require a new consumer mind-set, as business models based on PCTW.

*Micromanaging* refers to a perceived need to be involved at every point in the production process to ensure visual and quality wise results, stressed by RB2. With regards to its new roots, both the designer and the manufacturer needs a learning period to familiarise with the processes. Here, the better the supplier integration is the less the need for micromanaging. Finding a supplier with the right capabilities to produce desired quality and establishing a trustful relationship will contribute to a better outcome (Petersen et al. 2005; Garza &
Furthermore, a *flexible product design, which allows for the properties of the raw material to vary,* might reduce the need for *micromanaging.*

Flexibility is also discussed by RB2 in terms of consumer expectations on re:construct products as they are generally compared to conventionally produced products. This is a critical aspect due to the immensely different preconditions. The requirements for industrial products are that they must be flawless and uniform in order to be sold and as little as a button falling off is an accepted reason to reclaim a product. This has most probably created cautiousness towards variations in products among consumers. However, redesigned products based on post consumer material cannot be uniform as those made from virgin raw material. Hence, the success of redesigned products requires flexibility from the consumer, which will take time to develop. But there is also reason to believe that there is (at least) a latent demand for this type of products, especially among consumers who search for unique styles to communicate their identity. CO1 identifies an increasing consumer segment in their second hand stores who visit them with the hope of finding unique garments. Hence, there is a potential here.

### 5.1.4 Concluding reflections

Individual and collaborative initiatives (Ekström & Salomonsson 2014) are both needed and currently taking place in order to enhance value creation in the identified network of actors. Collaborative initiatives are identified among cases as a growing trend to increase levels of collection, seen in for example CO2’s new company ReturTEX and between waste company Ragn-Sells and CO3 among others. Initiatives such as Re:Textile are on-going experiments to further develop *network collaboration* (Palm et. al 2014; Ekström & Salomonsson 2014; Abraham 2011) within this field. A *professional market to support the development of infrastructure* (Palm et al. 2014) is not yet apparent. However, as the value of textile waste is realised by more actors, a professional market is probable to evolve and has already started to attract new actors.

The changes of market conditions are already discussed among charity organisations. With regards to the interview findings, there is a need for these organisations to consider their future role within this system, what will their points of differentiation be? The identified network suffers from network complexity as described by Garza & Dedehayir (2012) as reducing resource allocation capabilities, efficiency and coordination of flows. The root to this is highlighted in the problem discussion, and includes a fragmented collection system as a result of ignorance about the value in textiles. Clothing brands are the only actor who is not currently depending on others for their value creating activities. An introduction of a recycling actor would enable clothing brands to be even more self-sufficient in their reverse value chains. Further, they can rely heavily on their strong brand and they have the capital and the consumer knowledge to identify and satisfy a demand.

Who should be responsible for enabling the value creation of PCTW? The individual actors, the government or the municipalities? The cases express a lack of regulations, but are at the same time not coherent in the discussion regarding producer responsibility. If a mandatory
producer responsibility would be implemented, the consequences for charity organisations would be both a reduced pressure on the inflow of material but it might also imply less attractive and thereby saleable garments. Producer responsibility does not necessarily lead to enhanced value creation. The most critical point in the reverse value chain, highlighted by both charity organisations and redesign brands, is the sorting process. In order to maximise the value of collected material, more resources need to be allocated to the sorting process.

At present, more complex activities of value creation from PCTW is still at the experimental level. Redesign is used as a symbol for reuse and to address the prevailing unsustainable consumption patterns. In terms of being a commercial activity, there is a widespread scepticism towards redesign among the charity organisations and clothing brands. A greater belief is given to lower levels of redesign that increases the value of the product without any, or by small, physical changes.
6. Conclusion

In accordance with the identified research gap, the thesis contributes to enhanced understandings of the reverse textile value chain. The adjusted framework is based on the theoretical findings paired with the empirical findings and is presented in the value chain model below, see Figure 6. The empirical case studies confirm the applicability of the theoretical framework for a textile context, however with consideration to the category specific antecedents in addition to the generic.

The category specific antecedents, presented in Table 8, are valuable to all categories of actors as a chance to learn from someone else's experience. This is a good reason for collaboration among the three categories, with regards to their respective unique core competences and experiences within their fields. The categories can complement each other’s business development initiatives, and by that extending the overall understanding of the reverse textile value chain. Charity organisations hold great experience in the reverse logistics operations, from collection to sorting and selling of reuse commodities. Clothing brands are knowledgeable in creating and maintaining consumer demand, as well as the attractive packaging and marketing of a product. Furthermore, redesign brands possess specific design knowledge about the construction, material properties and use. Hence, the three categories of actors can share expertise and ideas in order to increase the overall value creation in the identified network.
Figure 6. Value chain with the antecedents of value creation in reverse textile value chains

**Collection**
- Internal/external logistics operations
- Consumer involvement
- Increasing number of donors
- New channels
- Convenience
- Incentives: economic and emotional
- Partnerships with downstream actors

**Sorting**
- Strategic collection
- Expertise in sorting and valuation
- Entrance of fibre recycling actor

**Repair/washing**
- Internal/external equipment
- Internal/external competences
- Perceived profitability

**Reuse**
- Logistics operations
- Assortment planning
- Store segmentation
- Consumer orientation
- Competences among retail staff
- Durable quality and design
- Dry, clean, whole
- Marketing

**Re:Furbish**
- Communication of concept in garment and store
- Dedicated area for display in store

**External**
- Professional market
- Policy development
- Demographics
- Technology innovation

**Supply chain network**
- Network design
- Network collaboration
- Coordination and information flow between actors

**Re:Construct**
- Internal/external production resources
- Dedication of time
- Interest from top management
- Interest and competence among staff
- Flexible product design
- Cheap labour
- Consumer demand
- Communication of intrinsic values
- Required maintenance
- High degree of design
- Trend factor
### Table 8. Category specific antecedents: conclusion

<table>
<thead>
<tr>
<th>Actor</th>
<th>Activity</th>
<th>Key enabling attribute</th>
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<tbody>
<tr>
<td>Charity organisation</td>
<td>Collection</td>
<td>Multiple collection channels</td>
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<td></td>
<td></td>
<td>Close to sorting facilities</td>
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<td></td>
<td></td>
<td>Municipality labour departments</td>
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<td>Household collection</td>
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<td>Permission from municipalities</td>
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<td>Standards and certifications</td>
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<td>Sharing of economic burden</td>
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<td>Sorting</td>
<td>Holistic concept for deposition</td>
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<td>Flexible processes</td>
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<td>Municipality labour departments</td>
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<td></td>
<td>Reuse</td>
<td>Throughput</td>
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<td>Sales strategies</td>
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<td>Increasing consumer demand</td>
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<td>Municipality labour departments</td>
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<td></td>
<td>Re:couple</td>
<td>Simple changes</td>
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<td></td>
<td>Re:construct</td>
<td>Dedicated sales channel</td>
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<td>Competence development</td>
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<tr>
<td>Clothing brand</td>
<td>Collection</td>
<td>Impact during purchase moment</td>
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<td>Supplier take-back</td>
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<td>Charity organisation as receiver</td>
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<td>Re:furbish</td>
<td>Ambassadors</td>
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<td>Competence development</td>
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<td></td>
<td>Storytelling</td>
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<td>Retail brand</td>
<td>Re:construct</td>
<td>Secured access to material</td>
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<td>according to specification</td>
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<td>Project owners</td>
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<td>Marketing/ PR</td>
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<td>Micromanaging Supplier integration</td>
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### 6.1 Contribution

By combining previous research on value creation with reverse logistics, and empirically testing this in the textile industry context, this thesis has provided new knowledge in terms of the antecedents of reuse and redesign value chains from PCTW. It contributes to the deepening of knowledge regarding the current system’s preconditions and challenges, and identifies required attributes to create value from PCTW in Sweden. The research provides an indication of the areas in which development is needed in order to increase the level of value creation within the country, and hence where resources should be allocated.

### 6.2 Recommendations for further research

Throughout the research process, questions regarding the relevance of redesign as a business activity arose. There was uncertainty among cases due to the complexity of the process and the lack of experience, as well as whether there is a consumer demand for redesigned products. It is clear that more research is needed, especially within the field of redesign for
this area to develop further. As the consumer (partly) drives the development in the market, it is of interest to focus future research to the creation of the redesign market. Further suggested research areas for the future can be:

- Extending the mapping to follow the textile flow outside the Swedish borders, and thus map the entire lifecycle to disposal in order to identify possibilities to extend into a third lifecycle?
- The creation of an efficient redesign value chain from the perspective of 3DCE (simultaneously designing product, process and supply chain)
- Other categories of actors handling PCTW in Sweden, such as laundries and their possible further contribution to the network.
- Study actors who not yet engage in the handling of PCTW in Sweden, what would they require to get engaged?

Furthermore, the data available for this research highlighted future plans and prospects of the cases studied. It would be of interest to conduct a study around these plans to investigate what antecedents would be required to extend cases’ value creating activities into further operations.
References


Appendix I
Case descriptions

Emmaus Björlå, founded in 1965, engage in the reverse value chain by collection, sorting and retailing of second hand textiles in south and west of Sweden. The purpose of their engagement in the second hand industry is to allocate monetary resources to their international charity projects, and providing meaningful employment for people outside of the labour market.

Human Bridge, founded in 2001, engage in the reverse value chain by their collection, sorting, and retailing of second hand textiles with stores in the south of Sweden. The purpose of their engagement in the second hand industry is to allocate monetary and material resources for international aid work, and providing meaningful employment for people outside of the labour market.

Myrorna, founded in 1889, is the largest actor working with reuse in Sweden and engages in the reverse value chain by collection, sorting, and retailing of second hand textiles. Myrorna is owned by the Salvation Army. The purpose of their engagement in the second hand industry is to allocate monetary resources for social projects, and providing meaningful employment for people outside of the labour market.

Swedish Red Cross engages in the reverse value chain by collection, sorting, and retailing of second hand textiles and redesign, with stores all over Sweden. The purpose of their engagement in the second hand industry is to allocate monetary resources for local, national and global aid work.

Boomerang is a Swedish clothing brand who engages in the reverse value chain since 2008, through their take-back program ‘The Boomerang Effect’. Under this concept they have collection, sorting, and retailing of second hand (‘Boomerang Vintage’) and some redesign of their own garments. This is an addition to their business model, to communicate their sustainability philosophy.

Haglöfs is a Swedish outdoor clothing brand who engages in the reverse value chain since 2012, through their take-back program ‘Swapstories’. The concept consists of selective collection and retailing of second hand garments augmented by storytelling about the garments previous adventures. Revenues are donated to the environmental charity ViSkogen or Project Åredalen.

Uniforms for the Dedicated is a Swedish clothing brand who engages in the reverse value chain since 2014, through their concept ‘The Rag_Bag’. This concept is a channel for collection of garments, which are posted by the consumer and directed to the charity organisation Stadsmissionen.

Design Stories is a design collective made up by an interior architect, product designer and textile designer. They are engaging in the reverse value chain by product development assignments for redesign, as well as workshops and research.
Mocklis is a small clothing brand engaging in the reverse value chain by product development and online retailing of redesign. Mocklis was a part of the redesign initiative Around Collective.

Skryta is a design collective engaging in the reverse value chain by product development of redesign, as well as consultancy for companies to create redesign from production surplus. Skryta was a part of the redesign initiative Around Collective.
Appendix II

Interview guide

The network mapping:
Reflect upon the network mapping. Can you identify your company/organisation in the network? Are there actors or connections that have not been identified? Reactions?

Value creating activities:
1. Sorting
Describe the process of collecting and sorting post consumer textiles? What are the yearly quantities collected?
What resources enable collection and sorting?
Are there any actors or structural problems preventing you from collecting and sorting?
Do you collaborate with external parties in order to perform the activity?

2. Repair/washing
Do you perform repair and/or washing of collected post consumer textiles? If yes, for what purpose? What resources enable the activity? If no, what is preventing you from engaging in this type of value creation? Are there any actors or structural problems? Do you collaborate with external parties in order to perform the activity?

3. Reuse
To what extent do you sell collected post consumer textiles as second-hand commodities? (sales revenues, kilo, number of garment/year) What resources enable the activity? What is preventing you from engaging in this type of value creation? Actors or structural problems? Do you collaborate with external parties in order to perform the activity?

4. Redesign
Do you perform redesign activities from collected post consumer garments for sale? (sales revenues, kilo, number of garment/year)
Level 1. Repair, washing, reinforced concept by neck label, hangtags, logotypes, marketing, visual merchandising or similar.
Level 2. Small changes that do not affect the construction of the garment, such as to cut or add applications, prints, colour changes, washing, frictions, embroideries, change accessories, buttons or similar.
Level 3. Design solutions which changes the construction, design and/or cuts and give a unique product.
What resources enable the activity(ies)? What is preventing you from engaging in this type of value creation? Actors or structural problems?

5. Sales models
Do you perform alternative business models for second hand/redesign products? (renting, swapping or similar)
What resources enable the activity?
What is preventing you from engaging in this type of value creation? Actors or structural problems?
Do you collaborate with external parties in order to perform the activity?

General questions:
1. In what way do you benefit from engaging in value creating activities from post consumer textile? (economic, sustainability image, competitive advantage, innovation)
2. How do you perceive the conditions for engaging in value creation of post consumer textile today? (demand, availability of material, resources, collaboration with other companies/organisations, laws and regulations or others)
3. Are there any obstacles for value creation? Internal/external?
4. Do you have plans to develop or discontinue any value creating activities? What would it take to increase the value creation according to your plan? (internal/external)
5. Do you want to collaborate with other actors in the network, if yes, in what way?