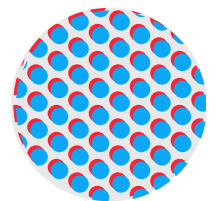


COLLECTION AS A SERVICE FOR DENIM BRANDS & RETAILERS

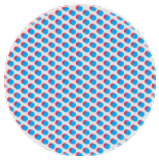


Graduation project by Anne Jacobs
MSc Strategic Product Design
February 2022

TU Delft supervisors:
Chair: Prof. dr. Hultink, H.J.
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Client supervisors:
James Veenhoff (House of Denim)
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Master thesis

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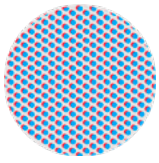
**We're all screwed
So don't tell us that**

**We can imagine a healthy planet
Because at the end of the day
It's too late to fix the climate crisis**

**And we refuse to believe
We need to demand a liveable future
Because we don't have a choice**

Now read this bottom up

patagonia



PREFACE

Dear reader,

I present to you my master graduation project, aiming to contribute to circular fashion. When I started my time in Delft at the architecture faculty, I could not have imagined a better outcome! I would like to use this page to thank the people who helped me achieve this.

The MSc track in strategic design showed me everything is possible. I realized I could combine my passion for sustainable fashion with my studies. The thesis is aimed at all who want to work on and learn about a circular fashion industry and are looking to do this from a business- or ecosystem perspective.

First of all, I would like to thank my TU Delft professors, Erik Jan Hultink and Rebecca Price. Rebecca, you challenged me to think about the bigger picture and the emotional value of the project. Erik Jan, thank you for your enthusiasm each time. And without you, the interview insights would not have had as much depth.

Secondly, a big thank you to client supervisors James Veenhoff and Peter Rijken. James, you trusted me with this assignment and your visionary thinking is a great inspiration. Peter, thank you for putting so much time into the project and explaining all the industry's

secrets. I am also grateful that Retail Experts wants to continue with a pilot. Next, I want to thank the people I spoke to and interviewed for my project, especially Daan Broekman from De Rode Winkel, Stan, Raymond and Simon.

Not all days were easy during the project. At times I hit a wall and I shed some tears. Luckily, I had a very good social safety net. First of all, a big thanks to my friends Lotte and Layla. I am proud of you and you kept me sane with our weekly video calls and by studying together. Thank you Roel, for having supported me in our own little family together with Simcoe in our crooked apartment in Breda. And for doing the majority of the dishes because you knew I hate doing that. I want to thank my parents and sisters for giving me a hug or a little (actually, more like a big- thanks mom) push, depending on which of the two I needed. Thank you Kim, Fiona, Nathalja and all my other friends and family and my dear roommates for showing interest in my project or for supporting me in other ways.

Without further ado, enjoy the read!

Anne Jacobs
Breda, February 2022



SUMMARY

This thesis aims to find a new collection method for post-consumer denim garments that fits the future context and the needs of ecosystem stakeholders. The thesis is aimed at all who want to work on a circular fashion industry from a business- or ecosystem perspective. The design solution is aimed at brands and retailers.

In a circular economy, denim is recycled at the end-of-life. To scale up recycling, collecting needs scaling up. Now municipalities grant the right to collect garments to collectors. They use textiles containers. The profitability of this business model is decreasing and many garments still end up in the trash.

Stakeholders in the denim industry were interviewed about the barriers, drivers and ideal situation for collecting or working with post-consumer (recycled) denim. The most critical barriers stakeholders mentioned are: clothing is treated as a waste stream; the company's scale is too small for impact; (fast) fashion is counteractive to circularity; financial barriers; a lack of transparency in the ecosystem; needing to convince consumers to hand in clothes; and uncertainties around legislation. The most important drivers they mentioned are: legislation (the Extended Producer Responsibility) leads to action; financial incentives (from legislation); more attention for sustainability; and growing consumer enthusiasm for sustainability. Consumers often value attributes like a comfortable fit over sustainability when buying garments. There is a need to educate the consumer on topics like handing in clothes. For an ideal situation, industry stakeholders mentioned: collaboration between stakeholders;

sustainability is profitable; brands and retailers take care of different steps in the value chain; more transparency. They also asked: should the future be local or global; and should we create closed loops within a brand or the industry? Trends that impact the ecosystem are trends in logistics and legislation.

Brands and retailers will be impacted by the Extended Producer Responsibility (EPR) and will bear responsibility for collecting garments at the end-of-life. Therefore, the design challenge is to facilitate the collection of worn denim for brands and retailers. The thesis studied the case of De Rode Winkel to learn more about jeans collection in stores. This gave insight into the volume composition of the collected jeans. The retailer kept some of the jeans, which led to a decrease in revenue for the sorter. A different approach to the business model was needed. Therefore, the design challenge was redefined to develop the business case of collection as a service.

In the final design, Textiles2Textiles offers collection as a service (CaaS) to denim brands and retailers. The consumer hands in their garment at a store and receives a discount. The service, called the Collecting Collective, takes care of educating the consumer; providing retailers and brands with the means to collect; and sorting the garments and sending them to the right step in the value chain. The service can exist in a system without and with the EPR. At first, the service will be only for denim garments, but will later extend to the collection of all garments.

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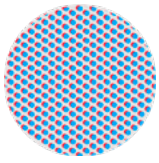
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INTRODUCTION

This report guides the reader through the steps of this graduation project on collecting post-consumer denim.

This project aims to find a new method of garment collection that fits the future context. The material of focus is denim.

The report consists of five chapters: project introduction, understanding the context, from research to design, final design and conclusion, discussion and reflection. A summary concludes each part.

Chapter one, the project introduction, first, explains the circular economy in the denim industry. Then, the client organizations are presented, followed by the project assignment and the approach.

Chapter two, understanding the context, explains the ecosystem for post-consumer denim collection. Then, the thesis describes the barriers and drivers for collecting and working with post-consumer (recycled) textiles, followed by consumer insights. After that, the project shows the trend research, followed by insights into an ideal situation.

Understanding the context is followed by the translation from research to design

in chapter three. The design brief is clarified, followed by the ideation phase and a case study with De Rode Winkel for collecting in stores. The section after that describes two discussion sessions and then the revision of the design brief for collection as a service.

The fourth chapter describes the final design of collection as a service and shows the horizon planning.

Chapter five ends with the conclusions, discussion, recommendations and a personal reflection.

Concepts and abbreviations

This report uses concepts and abbreviations that might need explaining. Table 1 on the right shows an overview of different concepts and their meaning. Early in the project, the graduation team discussed the influence of semantics and understandable and attractive wording on the acceptability of the design solution. This is taken into account in the execution of the design. However, for the readability of this report, abbreviations are used.



Concept	Abbreviation	Meaning
Circular economy	CE	The circular economy as described by the Ellen MacArthur Foundation is an industrial system that is restorative or regenerative, instead of the current linear make-take-waste system. A circular economy aims to “design out” waste (Ellen MacArthur Foundation, 2013).
Collection as a service	CaaS	Collection as a service is a service offered by sorter Textiles2Textiles to brands and retailers. CaaS is the abbreviation for collection as a service, not to be confused with containers as a service, content as a service or other C words as a service.
House of Denim	HoD	House of Denim is one of the client organizations. They are a non-profit foundation working towards a sustainable denim industry.
Extended Producer Responsibility	EPR	Legislation that the government is currently working on that will make textiles producers responsible for collection, recycling, reuse and the end-of-life in general of their products. This legislation is scheduled to be implemented in 2023 (Ministerie van Infrastructuur en Waterstaat, 2021).
Post-consumer		Post-consumer materials are materials which are discarded by end users after use.
Post-consumer recycled	PCR	Post-consumer recycled textiles are textiles that are discarded and recycled after an end user has used the textiles.
Retail Experts	RE	Retail Experts is one of the client organizations. They provide ICT solutions for retailers.
Textiles2Textiles	T2T	Textiles2Textiles is one of the client organizations. They use machines that are called Fiber Farms to process non-rewearable post-consumer textiles into resources.

Table 1. Explanation of abbreviations and concepts that are used in this report.



1. PROJECT INTRODUCTION

THIS PART INCLUDES

- *1.1 CIRCULAR ECONOMY IN THE DENIM INDUSTRY*
- *1.2 CLIENT ORGANIZATIONS*
- *1.3 PROJECT ASSIGNMENT*
- *1.4 METHOD*

**>> JUMP TO
CONCLUSIONS (p. 23)
OR
READ ALL >>**

1.1

CIRCULAR ECONOMY IN THE DENIM INDUSTRY

This chapter introduces circular economy in general and in the denim industry. Also, this section explains the Dutch ambitions on a circular fashion industry and transition design.

1.1.1 Circular economy (in the textiles industry)

Currently, most of our industries, including the textiles industry, function linearly: we take resources, we make something out of it and then we waste it (take, make, waste). On the

contrary, in a circular economy, the system is restorative or regenerative. In a perfect circular economy, waste does not exist (Ellen MacArthur Foundation, 2013). The aim is to transition our linear economy into a circular one. The Dutch government has set targets for a fully circular economy by 2050 (Ministerie van Infrastructuur en Waterstaat, n.d.).

There are two cycles for restoring resources (see Fig. 1): the bio-cycle and the techno-cycle. In the bio-cycle, products and

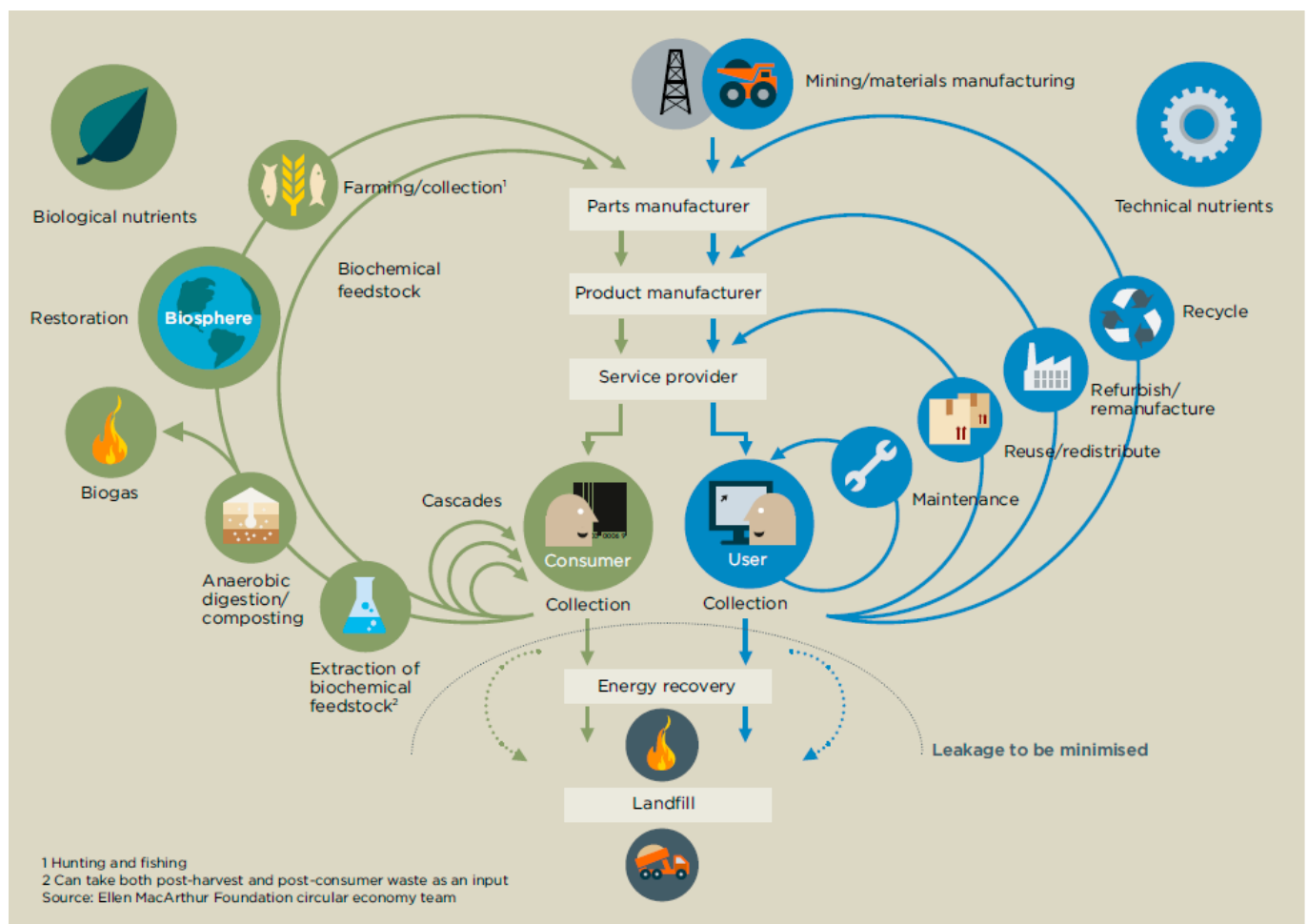


Figure 1. The bio-cycle (on the left) and the techno-cycle (on the right) of the circular economy (Ellen MacArthur Foundation, 2013).

materials are reintroduced in the biosphere in a non-toxic way through restorative loops. The materials that can not naturally decompose fall under the techno-cycle. In this cycle, there are different cycles of repairing, reusing, refurbishing and finally recycling, using the product or material for as long as possible. Some of the resources used to produce textiles, like cotton, fall into the bio-cycle. Others like polyester fall into the techno-cycle. Denim is made of a biodegradable material: cotton. However, denim is produced with many chemicals and sometimes a mix of non-biodegradable materials (Ellen MacArthur Foundation, 2017). A pair of jeans made of cotton fibers does not degrade easily in practice. Because of this, the bio-cycle is not an option for denim or most clothes. Therefore, at the end-of-life, denim is recycled.

“Clothing collection needs to be scaled up and implemented in locations where it doesn’t exist yet.”

(Ellen MacArthur Foundation, 2017)

1.1.2 Improve recycling & collecting for a circular textiles industry

The Ellen MacArthur foundation mentions four ambitions for a circular textiles economy (Ellen MacArthur Foundation, 2017), see Fig. 2. This thesis looks into the ambition of radically improving recycling by scaling up clothing collection. In the Netherlands, clothing collection is the responsibility of municipalities. Around 55% of all textiles end up as household waste (FashionUnited, 2021), so there is room for improvement. The industry is working on legislation called “The Extended Producer Responsibility”. This legislation means that

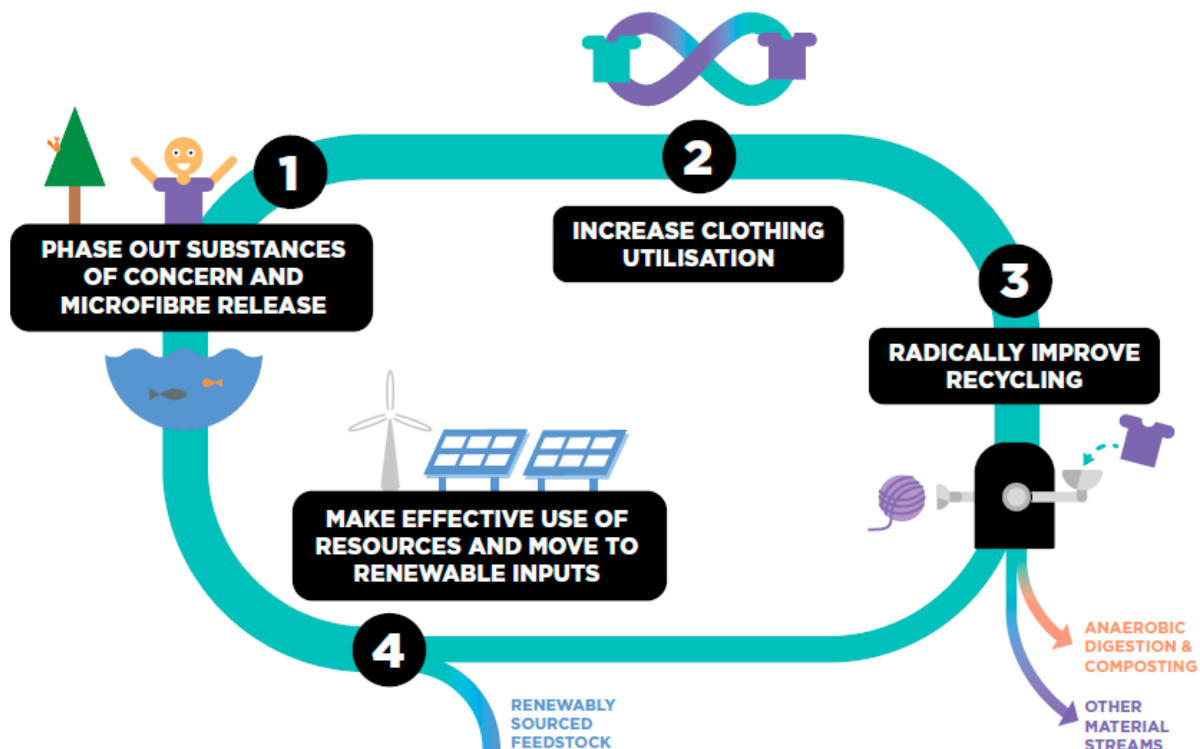


Figure 2. The four ambitions for a new textiles economy (Ellen MacArthur Foundation, 2017).

textiles producers and importers will be held responsible for a circular industry and for collection of garments.

1.1.3 A Dutch initiative for circular denim: The Denim Deal

The Denim Deal is a Dutch initiative focusing on transitioning to a circular denim industry. In October 2020, 30 stakeholders signed the Denim Deal (see *Img. 1*) to contribute to the ambition of making the denim supply chain greener, including both client organizations.

The ambitions of the Denim Deal are the starting point for this project. The initiative's focus lies in making post-consumer recycled textiles the industry standard. The first ambition is to work towards at least 5% post-consumer recycled textiles in all denim garments. However, Scotch & Soda, Mud Jeans and Kuyichi have already pledged to

jointly make denim garments that contain 20% post-consumer recycled textiles instead of 5% (Sommer, 2020). James Veenhoff, one of the client supervisors, was the main initiator of the Denim Deal. Next to the client organizations, the deal is signed by stakeholders like the Municipality of Amsterdam, the Ministry of Infrastructure and Water Management, Ministry of Economic Affairs and Climate, Leger des Heils ReShare, Wieland Textiles, Kings Of Indigo, Kuyichi and MUD Jeans.

This project aims to contribute to the goal of the Denim Deal of including at least 5% of recycled textiles in denim garments by doing research into and designing for the ecosystem for collecting post-consumer denim garments.

1.1.4 Why denim?

Client organization House of Denim's core business is denim, both client organizations



Image 1. The moment of signing the Denim Deal with Imogen Nulty (Scotch & Soda) on the left, James Veenhoff (House of Denim) in the middle and Hans Bon (Wieland Textiles) on the right (Sommer, 2020).

joined the Denim Deal and the Denim Deal is a good platform for kick-starting collaboration. This makes denim the perfect starting point for the graduation project. Also, denim is timeless, suited for almost every occasion and has a broad target audience. It is an exciting product that changes through wearing. These reasons make it a suitable material to use in storytelling to make the consumer enthusiastic about handing in garments.

1.1.5 Transition design: from a fast fashion system to a slow fashion system

Transition design plays an important role when transitioning from the old system of the linear fashion industry to a new system. The old fast fashion system needs to be phased out for a new system to take its place. This is a process that often takes decades.

Fig. 3 shows the process of societal transitions, where a new system needs to be

built up and the old one needs to be broken down. This thesis argues that the transition in the denim industry is now just before the point where these two systems intersect. There are plans for new legislation, but these have not been instituted yet. Experiments are happening with new business models and technologies, but these are not yet advanced enough to break the old system down. Now is a perfect moment to start this project, as there is a lot of industry momentum with initiatives like the Denim Deal and legislation like the EPR.

One of the means to accelerate the transition is learning by doing: starting experimentations and being surprised by the outcome (Loorbach et al., 2017). This graduation project includes a case study and an experiment to learn from practice. In the end, this thesis will also give recommendations for phasing out the old system.

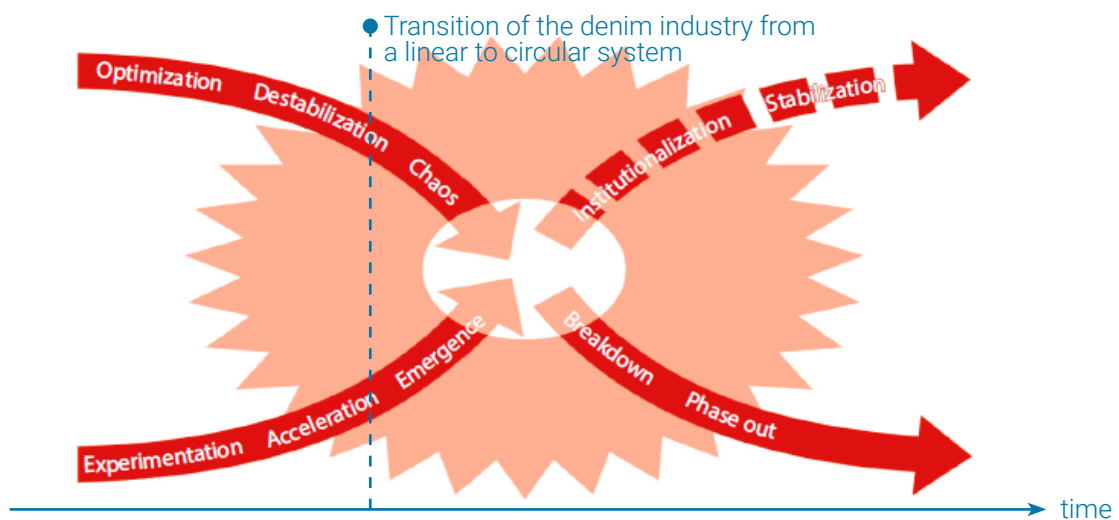


Figure 3. The model of Loorbach et al. (2017) which illustrates how in societal transitions an old system needs to be broken down while a new system is built up. In blue the transition of the denim industry is mapped onto this model.

1.2

CLIENT ORGANIZATIONS

This chapter explains the client organizations for this project and their relation to the graduation project. The two main client organizations are House of Denim and Retail Experts. Retail Experts is part of a consortium with two other companies, Textiles2Textiles and CHASE, which are also relevant for this project.

1.2.1 House of Denim

House of Denim (HoD) is an independent non-profit organization based in Amsterdam on a mission for a brighter blue. This means they aspire to create a sustainable denim industry. Their focus points are collaboration in the industry; promoting best practices; and educating a new generation of talent (House of Denim, n.d.).

House of Denim is part of the Denim Deal.

The client supervisor for this project, James Veenhoff, is the founder of House of Denim and one of the initiators of the Denim Deal.

The Jean School and Denim City are important parts of the foundation. Denim City (see *Img. 2*) is the physical location in Amsterdam that houses not only the Jean School but also start-ups and a denim shop. The Jean School dedicates itself to educating students in denim development.

By doing research in and designing for the collection of worn denim, this graduation thesis contributes to HoD's mission for a brighter blue. Next to that, this project focuses on ecosystem innovation and collaboration between stakeholders, which aligns with HoD's areas of focus.



Image 2. This is the sewing workplace in Denim City, which is part of the House of Denim foundation (House of Denim, n.d. -a).

1.2.2 Retail Experts

Client organization Retail Experts provides ICT solutions for retailers. Their clients include the ReShare stores that sell vintage and second-hand clothes and Loods 5, which sells clothes and bed textiles (Retail Experts, n.d.). Retail Experts is part of the Denim Deal. Peter Rijken is the founder of Retail Experts and is the client supervisor for this project.

Retail Experts saw that some of their clients were struggling with the future responsibility of collecting textiles that might be imposed on them through legislation. This project contributes to Retail Experts because it can help their clients with these questions.

1.2.3 Textiles2Textiles

Textiles2Textiles (T2T) focuses on reusing garments and textiles fibers. Their “Fiber Farms” consist of multiple machines that process non-rewearable post-consumer textiles into clippings. *Img. 3* shows one of

the machines that sorts garments based on material. As a supplier of textiles clippings to recyclers, T2T is an essential stakeholder in the denim industry. T2T is part of the Denim Deal.

Textiles2Textiles was founded by sorting company Wieland Textiles and by Retail Experts. The concept is still under development at the moment of writing this thesis and innovation is happening rapidly.

This project contributes to Textiles2Textiles because the company is an integrated part of the collection ecosystem. Their role is also part of the design solution.

1.2.4 CHASE

CHASE provides software for companies in the supply chain of textiles recycling. This software serves as a backbone between different stakeholders and different parts in textiles recycling.

CHASE results from a collaboration between textiles sorting company



Image 3. The fiber sort machine of Textiles2Textiles sorts the garments based on color, structure and material (Wieland Textiles, n.d.).

Wieland Textiles and Retail Experts.

CHASE is valuable to this graduation project as it will provide the software layer in the final design.

1.2.5 Positioning of the client organizations within the denim industry

Fig. 4 shows the relations between the client organizations and the circular textiles supply chain. The black part of the diagram

shows the original figure by Kazancoglu et al. (2020) and the pink lines illustrate the positioning of House of Denim, Retail Experts, Textiles2Textiles & CHASE.

CHASE, House of Denim and the Denim Deal have more of a connecting role for all stakeholders in the industry. Retail Experts is connected through their relations with the retailers. T2T forms an essential link between collectors and recyclers.

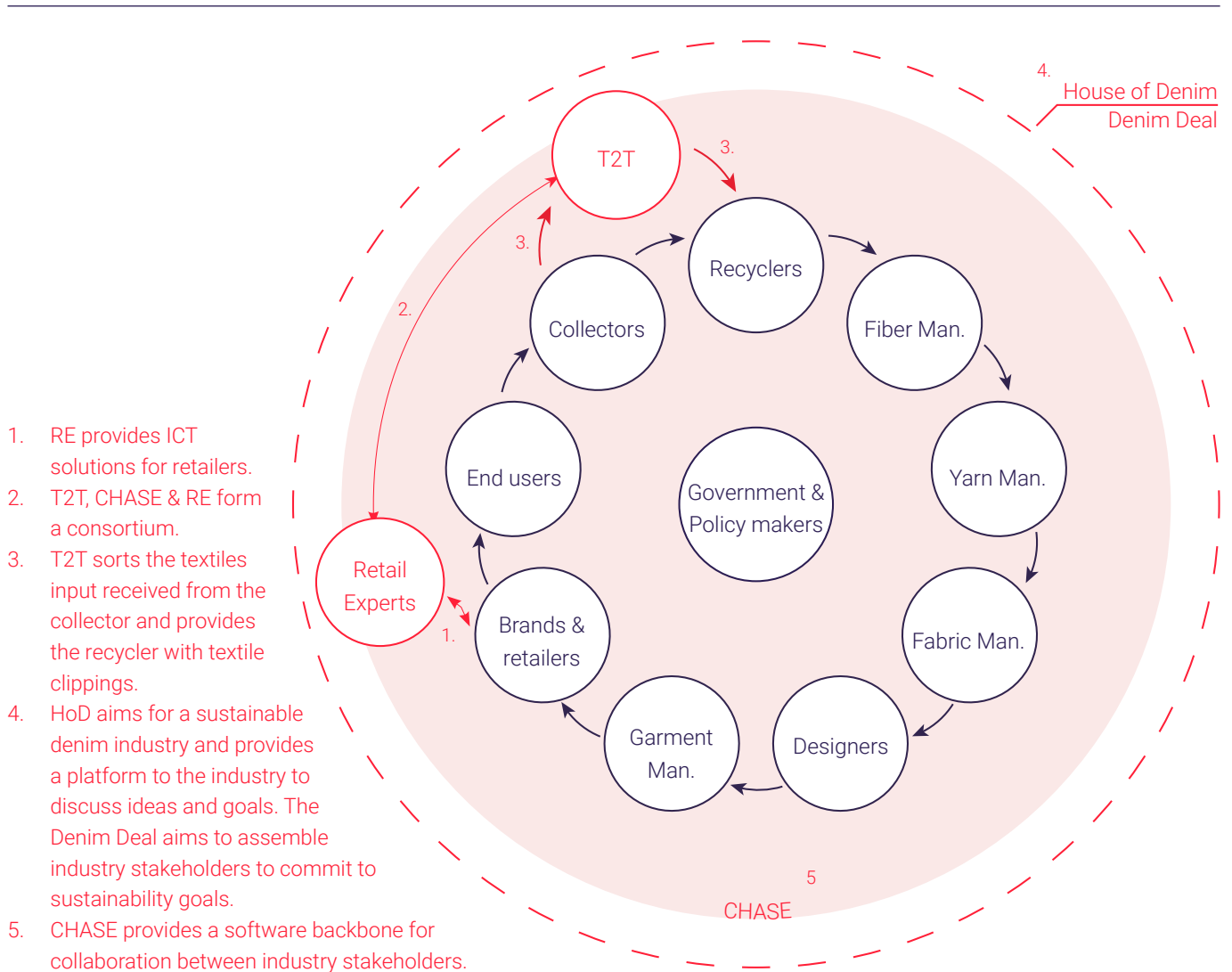


Fig. 4. An adaptation of the model of the circular supply chain by Kazancoglu et al. (2020) (shown in black) to illustrate the positioning of the client organizations with regards to the supply chain (shown in pink).



PROJECT ASSIGNMENT

This graduation project focuses on the collecting of post-consumer denim. The initial problem brief handed in to the graduation committee can be found in Appendix A. This chapter is a revision of the first problem brief.

1.3.1 Problem statement

The problem statement defines the current issue to research and design for. To make post-consumer recycled denim the industry standard, collection of post-consumer garments needs to be improved. Currently, many garments end up as waste and collection through textiles containers leads to polluted textiles. Also, the current business model for collecting is not sustainable. Next, collecting responsibilities are likely to shift to textiles producers and importers because of the Extended Producer Responsibility. We need to transition from a linear to a circular system. The goal is to innovate on the collection methods for denim garments.

1.3.2 Research questions

To learn more about the ecosystem for collecting denim post-consumer, we ask the following research questions:

1. What is the current situation regarding the ecosystem for collecting denim post-consumer?
2. Which stakeholders are involved in the ecosystem?
3. What are stakeholder barriers to

collecting post-consumer denim and working with PCR textiles?

4. What are the stakeholder drivers for collecting post-consumer denim and working with PCR textiles?

5. What is the ideal situation regarding collecting post-consumer denim and working with PCR textiles?

1.3.3 Expectations

While it is essential to start a design process with an open mind, there will always be assumptions. In this case, both client supervisors focused on retailers and brands wanting to collect in stores but not knowing how to. Therefore the assumption is that the design solution will focus on solving the collection issue for brands and retailers. Based on the research, this indeed turned out to be the focus area for the thesis.

1.3.4 Scope

This project's scope consists of the ecosystem of stakeholders in the denim industry that collect and/ or work with Dutch post-consumer (recycled) textiles. Table 2 shows what is in scope and what is not. The research focuses on collection, but also on the other steps in the supply chain to gain a good understanding of the ecosystem. Not all of the stakeholders, like denim mills and garment manufacturers, are located in the Netherlands. However, if they process Dutch textiles, they are within the

project's scope. Special attention is put to the ecosystem in Amsterdam, since many of the stakeholders are located there. In line with the Denim Deal, denim is the material of focus.

1.3.5 Contribution to existing knowledge

This thesis aims to contribute to existing knowledge in a few ways. First of all, the Ellen MacArthur Foundation stated in their report on a new textiles economy that barriers need to be addressed to scale clothing collection ([Ellen MacArthur Foundation, 2017](#)). Also, they mention that guidelines to support the implementation of post-consumer clothing collection could help scale up collection. This thesis does indeed explore the barriers and guidelines for collection.

“In countries where used clothing collection already exists, barriers need to be addressed to further scale these initiatives”

~ ([Ellen MacArthur Foundation, 2017](#))

In addition, previous research has been done into barriers and drivers for companies transitioning to a circular economy in other industries. This research contributes to this knowledge to focus on both drivers and barriers in the context of the Dutch denim industry.

In the end, the most important impact to be made, is a contribution to the Dutch collection system of post-consumer garments in practice.

In scope	Out of scope	Notes
Non-rewearable garments	Rewearable garments	Rewearable garments are out of scope, because they should be repaired, reused or refurbished before there is a need for recycling.
Denim garments	Garments made out of other materials	
Stakeholders in the denim industry that have to do with collecting and working with Dutch post-consumer (recycled) textiles	Stakeholders that work with post-consumer (recycled) textiles which is not from the Dutch end-user	Focus on the region of Amsterdam. Not all stakeholders are located in the Netherlands.
All steps in the supply chain for post-consumer recycled textiles		Focus on the collecting part of the process.

Table 2. In scope vs. out of scope for the project.

This chapter describes the approach to the project and the methods.

1.4.1 The double diamond

The design process for this project is based on the double diamond developed by the Design Council (Design Council, 2019). This model (shown in Fig 5) has four phases: the discover-, define-, develop-, and deliver-phase.

In the discover phase, the designer finds out more about the problem and who is experiencing the problem. In the define phase, the designer redefines the initial problem brief. In the develop phase, the designer ideates on solutions that can solve the problem. Finally, in the deliver phase, the solutions are tested. Which work and which do not? Then the solution should be refined.

1.4.2 Understanding the context of collecting & the denim industry

The discover phase is the research part of this project. The research included a

literature review study, qualitative research through semi-structured interviews, a questionnaire and trend research.

First of all, a literature study was done. This thesis studied papers from the online databases of Google Scholar and the TU Delft library on the following topics:

- Sustainable fashion & textiles
- (Circular) ecosystem design
- Circular methods and design approaches
- Circular economy

The most important part of the research were the in-depth insights from industry stakeholders from semi-structured interviews. An overview was made of stakeholders in the supply chain for collecting and recycling post-consumer textiles focusing on denim (see Appendix B). There was a focus on denim brands since the assumption was there would be the most significant opportunity for design. Stakeholders of the student's and client supervisors' network were contacted over e-mail, phone and through LinkedIn. This resulted in 20 interviewees (see Table 3 for an overview of interviewees). The duration of the interviews ranged from 20 minutes to 50 minutes.

For the interviews, an interview guide was developed, including the following topics:

- Getting to know each other
- Situation now with regards to collecting/ recycling/ working with PCR denim
- Ideal situation with regards to collecting/ recycling/ working with PCR denim
- Changing stakeholder roles

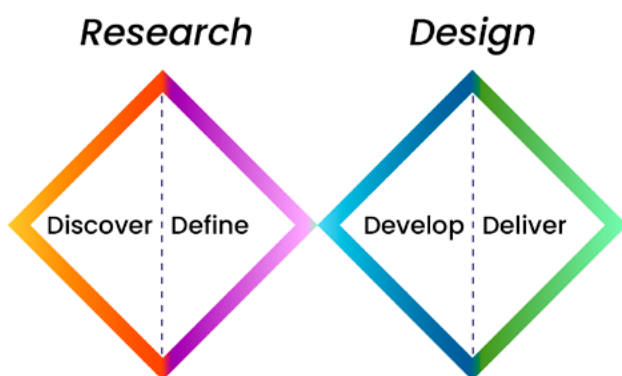


Fig. 5. The double diamond model is used for the approach to this thesis.

The topics changed slightly per stakeholder according to their role in the supply chain. See Appendix B for the interview guide. Appendix C shows an example of an interview script with a denim brand.

The interviews were then transcribed using AI software and checked manually. The interviews with the industry and logistics experts were not transcribed but served as inspiration for the process and validation of certain assumptions. From the interview with House of Denim, the important insights were noted down as the audio quality was not good enough for transcription.

After having transcribed the interviews,

Interviewee	# of interviewees	Online/ in person
Denim brand	6	4 Online, 2 in-person
Retailer	1	In person
Municipality	2	Online
Textile collector & sorter	2	Online & through phone
Collector	1	Online
Representative second-hand stores	1	Online
Chemical recycler	1	Through phone
Retail Experts & T2T	1	In person
Garment producer	1	Online
House of Denim	1	Through phone
Industry expert	1	Online
Logistics experts	2	Online, through phone
Total	20	

Table 3. The interviewees and number of interviewees included in the research phase.

the researcher coded the text using Atlas.ti software. With coding, each line or section of text receives a code that explains what the text is about. This is an example:

“Of course it shouldn’t be the case that the CO2 we save is then pumped back into the air in the logistics-phase. So we’re working on that right now.” → coded as Transportation is not sustainable

These codes were then categorized and the researcher identified relations between categories (see Appendix D for the categories). Constructs are included in the results when they have been mentioned at least by three interviewees. Some were mentioned twice and were still included when there is mention of this construct in literature as well. Where this is the case, it is indicated.

To learn about the needs and behavior of consumers, the researcher used a questionnaire. The topics in the questionnaire were:

- The consumer and their clothes
- The end-of-life of clothes
- Consumer and their jeans
- General info

Appendix E shows the complete questionnaire. The questions were spread among friends, family and colleagues. The researcher used snowball sampling to find more respondents. In the end, 39 respondents answered the questionnaire. This is not enough data to create significant results. However, a complete picture was created combined with literature findings and insights from interviews.

The discover phase was concluded with **research into trends** that impact the ecosystem.

1.4.3 Define the design challenge

In the define phase, the student revisited the problem brief and translated it into a **design brief**. The design brief was later revised at the end of the ideation phase.

1.4.4 Develop different solutions

In the ideation phase, **how-to questions** shaped the ideation areas. Multiple ideas were generated through **sketches** (see Appendix F). Also, the student did **an online creative session** with three other students (Appendix I). **Storytelling** was used to find inspiration, see Appendix J. Finally, the student decided between the concepts through discussions with the project mentors and by using the **datum method** (see Appendix G). This method is used for the evaluation of design alternatives.

The design concept that was decided on, collection in stores, was studied in a **case study** with De Rode Winkel. Next to that, an **experiment through social media** was done to find incentives for consumers. The final design direction for collection as a service (CaaS) was discussed in two **feedback sessions** with stakeholders and described in a second version of the design brief.

1.4.5 Define the design solution

A **customer journey** for a pair of jeans and for the end-consumer describe the final design solution. Next to that, the **desirability, feasibility and viability** were researched. The student did **validating interviews with brands and consumers**. For the viability, the **financial statement of the business model** was defined. Then a **horizon planning** for the design solution was delivered.

1.4.6 Limitations in using semi-structured interviews

Using semi-structured interviews comes with limitations. First of all, the insights tell us something about stakeholders already aware of the need for sustainability because of how they were selected. Drivers and barriers for stakeholders who are not aware of sustainability are not explored. Second, the interviews were conducted by the same person leading to interviewer bias. Thirdly, the defined constructs are not necessarily facts, but rather perceptions by the interviewees.

These limitations were taken into account by cross-checking the constructs with similar mentions in literature, doing trend research, and discussing the results with the client supervisors.



SUMMARY

PROJECT INTRODUCTION

(1.1) In a circular economy, the system is restorative and regenerative. Although made of cotton, denim is hardly biodegradable and needs to be recycled. Clothing collection needs to be scaled up for recycling. Because of expected legislation (the Extended Producer Responsibility), textiles producers & importers will be held responsible for collection in the future. The Denim Deal is a Dutch initiative that focuses on the transition to a circular denim industry. This thesis focuses on scaling up the collection of denim. For the transition to circular denim, we also need to phase out the old fast fashion system.

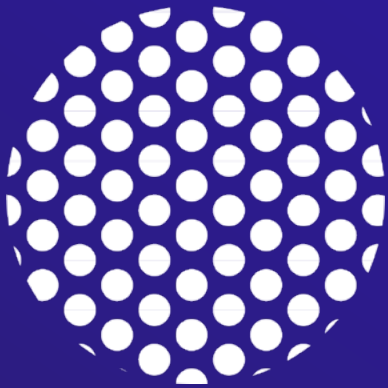
(1.2) The client organizations for this project include House of Denim, Retail Experts, Textiles2Textiles and CHASE. HoD is a non-profit organization on a mission towards a brighter blue - a sustainable denim industry. This project contributes to their mission by researching the collection system. Retail Experts provides retailers with ICT solutions. This project contributes to RE by looking into solutions for their clients, the retailers, to collect. T2T focuses on the reuse of garments and textiles fibers. Also, they are an important asset to the final design solution. CHASE provides stakeholders with software that connects them and different steps in textiles recycling. CHASE will provide the software layer in the final design solution.

(1.3) The problem statement includes the necessity for innovation on the collection of

post-consumer denim garments. Research questions on the current situation of the ecosystem for collecting denim, the stakeholders, the barriers and drivers and the ideal situation shape this thesis. The scope for the project is the ecosystem of stakeholders in the denim industry for collecting and working with Dutch post-consumer (recycled) textiles. This contributes to existing knowledge by looking into the barriers, drivers and guidelines to scale up clothing collection in the Netherlands.

(1.4) This project uses the double diamond method, which includes a discover-, define-, develop- and deliver phase. The discover phase's most important part is the qualitative interviews with industry stakeholders, next to a literature study, a questionnaire and trend research. The problem brief is written into a design brief in the define phase. For the develop phase, how-to questions, sketches, a creative session storytelling and the datum method were used. Also, a case study was done, next to a social media experiment and feedback sessions were held. In the define phase, a customer journey describes the service. Also, a desirability, feasibility and viability study was done, next to validating interviews. This thesis describes a financial statement and a horizon planning as well.

The next part of this report explains the research.



2. UNDERSTANDING THE CONTEXT OF COLLECTING & THE DENIM INDUSTRY

THIS PART INCLUDES

- *2.1 ECOSYSTEM FOR POST-CONSUMER
DENIM COLLECTION*
- *2.2 BARRIERS & DRIVERS*
- *2.3 CONSUMER INSIGHTS*
- *2.4 TREND RESEARCH*
- *2.5 IDEAL SITUATION*

**>> JUMP TO
CONCLUSIONS (p. 45)
OR
READ ALL >>**

2.1

ECOSYSTEM FOR POST-CONSUMER DENIM COLLECTION

This chapter describes the current ecosystem for post-consumer denim collection and the involved stakeholders.

2.1.1 Collection of post-consumer denim

There are different ways of collecting, see Fig. 6. In the Netherlands, collecting post-consumer textiles is the responsibility of the

municipalities. They close contracts with textile collectors ([Vereniging Herwinning Textiel](#), n.d.). Often textile containers are used which are placed underground or above ground in the streets. A common problem is that the textiles are polluted by rain or by the consumer throwing away household waste in the container.







COLLECTION TYPE	DESCRIPTION	EXAMPLES	MAIN ADVANTAGES	MAIN DISADVANTAGES
 MUNICIPAL WASTE COLLECTION	Garments are collected through municipal waste collection	Most countries	High convenience Suitable for large scales	Textiles mixed with other waste need to be separated out and also accumulate dirt from other waste
 SINGLED-OUT KERBSIDE COLLECTION	Separate kerbside collection of unwanted clothes	Some municipalities including in the US, UK, and China ⁴⁷³	Potential for large scale	Households need to separate out clothing for collection Separate logistics needed
 HOME PICK-UP	Ordered courier collects textiles	British Heart Foundation ⁴⁷⁴	High convenience for user Can be combined with return of rented items	Work-intensive and tailored routing needed
 NEIGHBOURHOOD COLLECTION CONTAINERS	Users take garments to local collection containers	Red Cross, ⁴⁷⁵ TEXAID, ⁴⁷⁶ San Francisco ⁴⁷⁷	Relatively convenient if container density is high Large scale possible	Separate logistics needed
 BRAND MAIL-BACK	Users are asked to mail their unwanted clothes back to brands	Patagonia, ⁴⁷⁸ Eileen Fisher ⁴⁷⁹	Can be combined with incentive system	Users have to mail items
 RETAILER DROP-OFF	Users bring garments back to retailer	H&M, ⁴⁸⁰ Zara ⁴⁸¹	Can be combined with incentive system Large scale possible	Users have to remember to take items along
 CHARITY SHOP DROP-OFF	Users take garments to charity shops	Oxfam, ⁴⁸² Red Cross, ⁴⁸³ British Heart Foundation ⁴⁸⁴	Implicit incentive system Large scale possible	Users have to bring items to a shop

Fig. 6. Different ways of textiles collection globally ([Ellen MacArthur Foundation](#), 2017).

Collectors pay for the right to collect, but as the quality of the clothes decreases, this is often not a viable business anymore (Leger des Heils, 2021).

In the Netherlands, in 2019, 554 kiloton (1 kiloton = 1.000.000kg) of textiles disappeared from the stock. Of this volume, municipalities collected 86 kiloton. However, 174 kiloton was thrown away as residual waste. If textiles end up as residual waste, they can not be reused (Centraal Bureau voor de Statistiek, 2021). Therefore there is much room for improvement.

2.1.2 The ecosystem for collecting post-consumer denim

Fig. 7 shows the circular textiles supply chain for non-rewearable denim garments. All of the stakeholders are connected through a layer of transport. House of Denim and the Denim Deal provide a platform for discussion for the stakeholders.

2.1.3 The scenario of a pair of jeans

The figure on the right (Fig. 8) shows the scenario for a pair of jeans bought by a consumer and recycled at the end of life.

Fig. 8. The current scenario for a pair of jeans. >

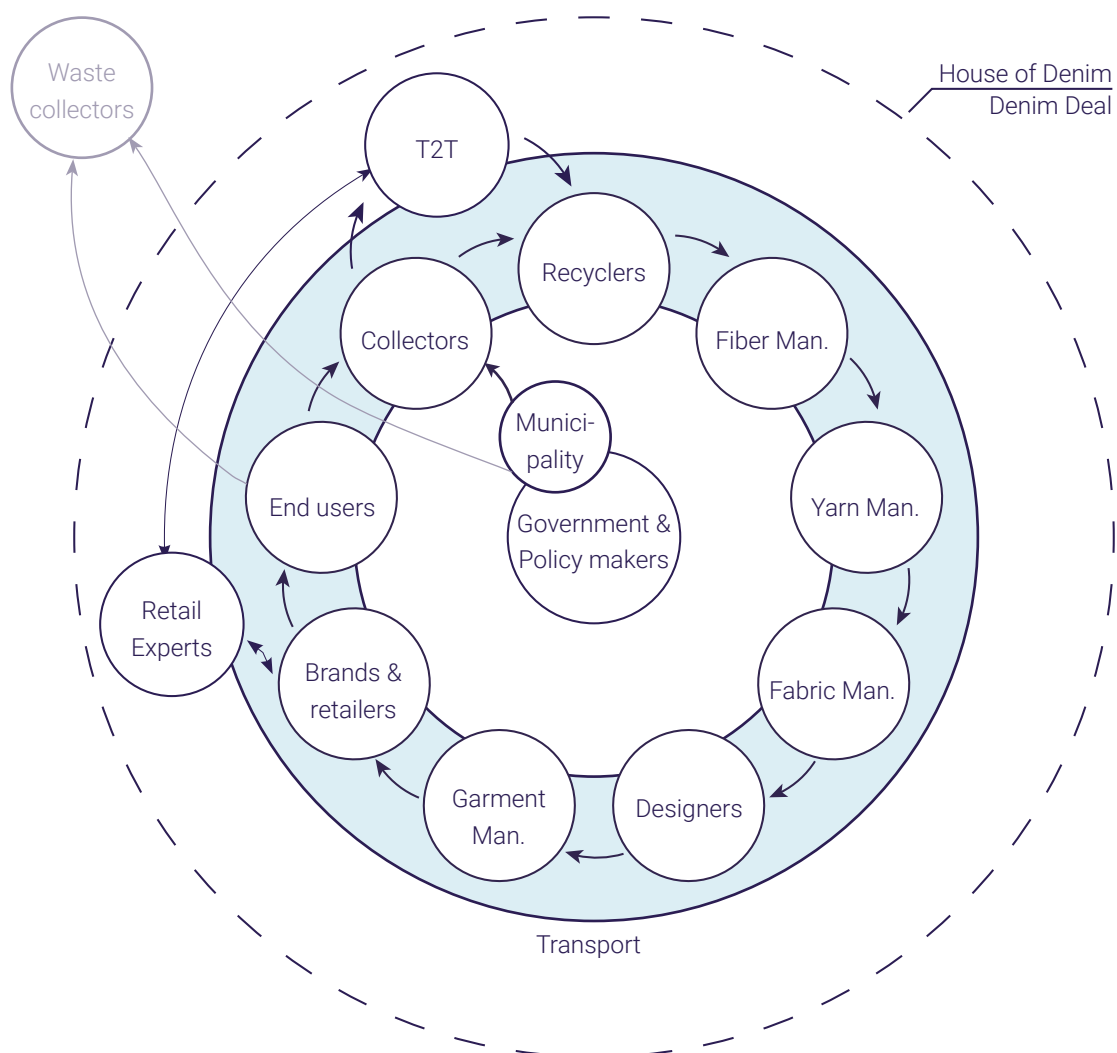


Fig. 7. An adaptation of the model of the circular supply chain by Kazancoglu et al. (2020) to illustrate the ecosystem for textiles collection in the Netherlands.

Current scenario



A beautiful pair of jeans was designed with great care by **jeans brand**. Jeans Are The Best.

logistics partner

This scenario describes the collecting and recycling of a pair of jeans. This scenario does not describe all of the possible routes, but aims to give an impression of the process.

Here comes Lotte (**consumer**). She buys said pair of jeans from the **retailer**. Just her style!

Lotte also has the opportunity to buy from different channels, like an online retailer, brand store or online brand webshop.



The brand can use the fabric containing post-consumer recycled cotton fibers in a design for a new pair of jeans!

logistics partner



The cotton fibers are spun into yarn by a **spinning mill**, dyed, woven into fabric by a **fabric manufacturer** and finally, made into a garment by the **garment manufacturer**.

The jeans might be laundered or bleached as part of the finishing treatment.

Lotte loves her jeans, In fact, she wears them so often they need to be repaired at a **repair shop**. After two years they are broken down beyond repair.



*Other disposal options include the trash bin, donating to a **good cause** or to friends and family, **second-hand stores**, etc.*

logistics partner



Other ways to recycle are chemical recycling or felting.

The scraps are transported to a **textiles recycler** (abroad or local) who shreds the clippings (mechanical recycling).

Lotte says goodbye to her favourite pair of jeans and donates the item in a textiles container in her **municipality**.



logistics partner



Which are then sold or cut into clippings and cleaned from things like zippers and buttons, ready for export!



Non-rewearables are sorted based on material structure & color.

Rewearables and multi material non-rewearable items are sold to buyers.



logistics partner

At the **textile sorter**, the items are first sorted based on quality and type of garment.

2.2

BARRIERS & DRIVERS

This chapter describes the barriers and the drivers to collecting and working with post-consumer (recycled) denim from the interviews with industry stakeholders.

2.2.1 Barriers to collecting and working with post-consumer (recycled) denim

Stakeholders in the denim industry encounter barriers to collecting and working with post-consumer (recycled) textiles. Table 4 describes the barriers and categories. Fig. 9 shows the relative ranking of the barriers

based on systemic vs practical challenge and impact. The right upper quadrant highlights the seven barriers that are most important to solve. First of all, clothing is seen as a waste stream and treated as waste. Secondly, stakeholders indicated their company was not big enough to facilitate collection. Also, fast fashion is counteractive to circularity as the quality of material decreases. Mixes of materials may look fashionable but are more challenging to recycle. Next, financial barriers keep stakeholders from working with PCR

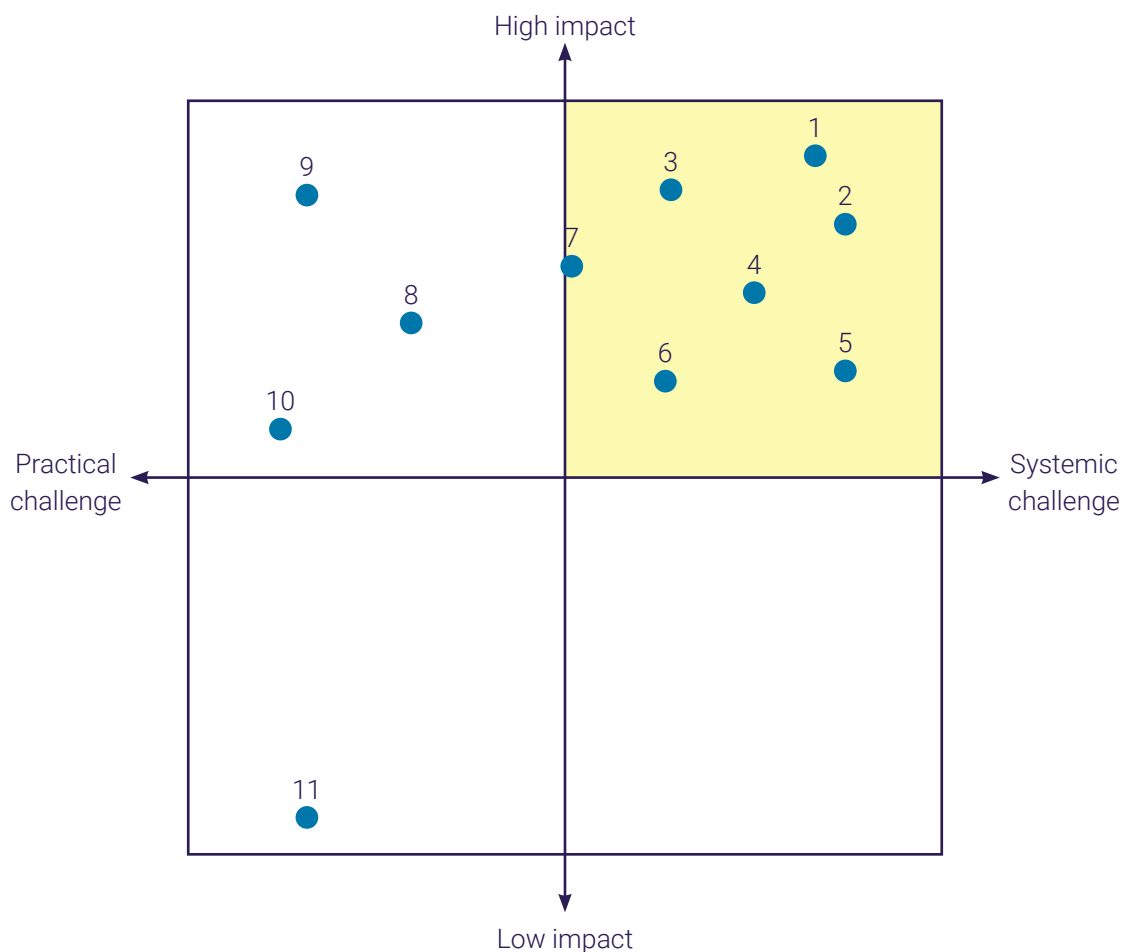


Fig. 9. Barriers to collecting and working with post-consumer recycled denim ranked on level and impact. The yellow quadrant highlights the barriers that have the most priority to solve.

Main category	Barrier subcategories	Impact on
1. Clothing is treated as a waste stream	B1: Part of collected clothes in textiles container become trash	Collectors
2. Scale is too small to make impact	B2: Scale of the company is too small to make impact	Brands & retailers
	B3: Volume of collected clothes is too small to do something with it	Brands, retailers, recyclers
3. (Fast) fashion is counteractive to circularity	B4: The percentage of low value non-rewearable material increases	Collector & sorter, recycler (brands indirectly)
	B5: Blends of materials are more difficult to recycle	Recyclers (brands, collectors & sorters indirectly)
4. Financial barriers	B6: Current business model behind collecting and sorting clothes is not profitable	Collectors & sorters
	B7: Sustainability is secondary to profits	Brands
	B8: Being more sustainable costs money B8.1*: PCR cotton is more expensive than virgin cotton	Brands
5. Lack of transparency	B9: Lack of traceability of where clothes come from and go to	Brands, collectors & sorters, recyclers
	B10: Lack of transparency in industry	All stakeholders
6. Convincing the consumer to hand in clothes	B11: Consumer does not want to take a lot of effort to hand in worn clothes	Brands & retailers
7. Uncertainties around legislation	B12: Uncertainties around upcoming legislation	Brands
	B13*: Legislation abroad against importing textile	Collectors & sorters (brands & retailers indirectly)
8. Difficult to convince management to become more sustainable	B14*: Difficult to convince management to become more sustainable	Brands
9. Missing connections in the supply chain after collecting	B15: Missing connection between brand/ retailer & next step in supply chain	Brands & retailers
	B16: Missing connection between brand & logistics partner	Brands
10. Transportation is expensive and unsustainable	B17*: Transportation is expensive	Brands, retailers, collectors & sorters
	B18: Transportation is not sustainable	
11. Space limitations	B19: Needing to find storage for collected clothes	Brands & retailers

Table 4. Categories of barriers mentioned by interviewees that impact collecting and working with post-consumer (recycled) denim.

textiles or collecting. A lack of transparency in the supply chain does not help either and the consumer still needs to be convinced to hand in their garments. Last but not least, there are a lot of uncertainties around (upcoming) legislation.

Some of the barriers were mentioned by only two stakeholders instead of three but were still included. Two brands mentioned barrier 8.1: PCR cotton is more expensive than virgin cotton. This barrier was mentioned as one of the main barriers in previous graduation research for House of Denim (Van Raan, 2019) and seems to be the general thought in the industry. Two of three brands without sustainability in their core DNA

mentioned Barrier B14: Difficult to convince management to become more sustainable. B13 (legislation against importing textiles) and B17 (transportation is expensive) were mentioned by two stakeholders. They are included since not all stakeholders are already at this point in progress and it is likely they will encounter this problem too in a later stadium.

Table 5 shows a definition and a proof quote for each category. Also, each category is linked to literature and the differentiation from literature is noted.

The barriers need to be considered in the design process as problems that need to be solved for stakeholders to adopt the solution.

Construct	1. Clothing is treated as a waste stream	2. Scale is too small to make impact	3. (Fast) fashion is counteractive to circularity	4. Financial barriers
Definition	Post-consumer textiles are seen and treated as waste instead of resources. The potential of post-consumer textiles as a resource is slowly being discovered.	When the brand or retailer is a relatively small company, it is difficult to make impact. The company does not have as many resources and leverage as a bigger company would have.	A lot of clothing items nowadays have blends in the materials and are of increasingly lower quality, making it more difficult to recycle.	The thought is that being more sustainable as a company and buying PCR textiles instead of virgin materials increases costs. Next to that, sustainability is often deemed secondary to profits.
Proof quote	<i>"The underground bins generally have a lot of trash. People who literally just throw their trash in there. And if it has rained a lot, the underground bins sometimes fill up, then they become soggy. That is also disastrous for the quality of the clothing."</i> ~ Collector & sorter	<i>"No, [we collect] just for our own brand, because we're just too small to solve the really big problem. We did run calculations on that, but that would not be profitable for us."</i> ~ denim brand	<i>"We have already done [closed loop recycling within brand] in a pilot. And then we allowed all [brands'] jeans to be returned. There we had the problem of very high contamination of other fibers. That was a real challenge for our denim mill."</i> ~ Denim brand	<i>[About making the clothing line more sustainable] "You simply pay a lot more, the cost is a lot higher. And it all has to be earned back at the end of the ride."</i> ~ denim brand
Link to existing literature	Clothing being treated as waste instead of resources as a typical "linear" mindset. In a circular economy the concept of waste is designed out and materials are treated as resources instead of waste (Ellen MacArthur, 2013).	We speak of economies of scale when a business benefits from the size of its operation. As a company grows, it costs less to produce (Corporate Finance Institute, 2021). Therefore it makes sense that smaller companies struggle more to make impact.	Clothing companies launch new items shortly after each other. This leads to less durable quality of clothing (Kazancoglu et al., 2020).	Low virgin material prices relative to circular materials undermine the affordability of circular products. Also, to operate in a circular way, high initial investment costs are needed (Kirchherr et al., 2018).
Differentiation from literature	The textile industry still has a long way to go in the transition to a circular supply chain if post-consumer garments are still treated as waste rather than resources.	Not so much a differentiation as a note for the design-phase: the difference in size of the companies is important to take into account.	In literature the bad quality of clothes is described to be a problem for recyclers. In this project it becomes clear that if you start pushing for the use of more PCR textiles, brands will experience the consequences as well.	Some brands choose to put products on the market that are more expensive, but are still desired by consumers because of their other USPs, like sustainability.

Table 5. Barriers to collecting and working with post-consumer recycled denim. [Continues on next two pages.]

Construct	5. Lack of transparency	6. Convincing the consumer to hand in clothes	7. Uncertainties around legislation	8. Difficult to convince management to become more sustainable
Definition	Stakeholders are not transparent about their way of operating and environmental impact. It is difficult to find out what happens or has happened with clothes and there is a lot of distrust.	Not all of the consumers want to consciously take effort to hand in worn clothes. They will only do it if it does not take too much effort.	New legislation, like the Extended Producer Responsibility (EPR), will be implemented in the next years. (Most) brands and retailers know that it is coming. However, the legislation is still being designed, so a lot is still unclear about what it will mean and what impact it will have.	Management has the final say in the course of a company. When a company is not sustainability focused, management can be difficult to convince to change course.
Proof quote	<i>"We have now said goodbye to [jeans brand], also because they simply lack transparency. They say that they are working on sustainability. But we see little transparency in that." ~ Retailer</i>	<i>"Quite a lot of consumers told us, I would just have to drive too far to do that." [about handing in jeans in stores] ~ denim brand</i>	<i>"The EPR is coming. I think that there is still quite a bit unclear in to what extent that will have an impact on us. Does it mean that we're responsible for every product, can we work with other brands to get it done? Or do you really have to be able to show what your products are and what you take back?" ~ denim brand</i>	<i>"This was already kind of far-fetched for the management to pull this off, this pilot [about pilot for collecting]." ~ denim brand</i>
Link to existing literature	A lack of vision and trust is described as a barrier, together with difficulties in collaboration and information sharing as well as problems of tracking and tracing of a product's life cycle and material flows (Kazancoglu et al., 2020).	Lacking consumer awareness and interest is mentioned as one of the main barriers for circular economy (Kirchherr et al., 2018). However, other studies report a significant part of consumers that are changing purchase preferences based on sustainability (Capgemini Research Institute, 2020).	In literature most barriers around legislation are mentioned as a lack of "smart regulation" or restricting legislation. An example of the latter is: not being allowed to transport material across the border where the recycle facilities are located (Kirchherr et al., 2018).	Circular economy is not integrated in company's strategies and KPI's and literature reports 'hesitant company culture' towards CE (Kirchherr et al., 2018). Difficulties in quantitatively measuring performance with regards to CE is mentioned as one of the managerial barriers (Kazancoglu et al., 2020).
Differentiation from literature	The proof quote shows that brands that are not transparent might suffer the consequences, like not being sold in particular stores.	From the interview insights clues were given that even the consumers who have more interest in sustainability, still will not hand in clothes if it takes too much effort. Therefore, instead of lack of consumer interest being the barrier, it might be more a lack of wanting to take effort.	While restricting legislation is mentioned by interviewees, the most mentioned barrier was not restricting or a lack of regulation, but a lack in clarity in upcoming legislation.	There is a difference between the stance of a company as a whole towards sustainability and the individuals within the company. The beliefs of individuals about sustainability do not always translate to management decisions.

Construct	9. Missing connections in the supply chain after collecting	10. Transportation is expensive and unsustainable	11. Space limitations
Definition	Brands or retailers have collected post-consumer textiles or want to work with PCR textiles, but do not know which stakeholder to turn to for the next step.	Collected clothes need to be transported to the stakeholder who can execute the next step in the supply chain. Some of the recyclers are located abroad. Transportation costs money and trucks emit CO2.	To collect clothes, you need storage space. Especially since you need to have a high amount of clothing items before you can efficiently process them.
Proof quote	<i>"Then we will make sure [the collected clothes] will end up in the right place. But the right place is difficult to find. Because brands say you can hand over the jeans, but if you have a 1.000 jeans that is a lot. Then they become reluctant. So we are still looking for the right way." ~ retailer</i>	<i>"I think a lot will happen in logistics. Because of course, if you are going to generate much more CO2 emissions in this way [by transporting jeans] this defeats the purpose, then you are doing it wrong." ~ denim brand</i>	<i>"I'm curious how that will go with the large parties if they have 2.000 customers on a Saturday and they all arrive with jeans. Where do you put it? That might be a problem for them that has to be solved at some point." ~ Retailer</i>
Link to existing literature	Manufacturers in the textile industry are used to operating in a linear way, making it difficult to communicate and coordinate between stakeholders who normally do not interact. (Kazancoglu et al., 2020)	One of the barriers found in literature is the lack of local or regional recycling facilities with reverse logistics infrastructure. Also, high capital investment is needed to create an infrastructure that supports reverse logistics (Kazancoglu et al., 2020).	No barriers were found in literature specific for storage limitations. This might be due to the fact that this is a barrier on a practical level.
Differentiation from literature	When brands and retailers take on the responsibility of collecting clothes and working with PCR textiles there is not only a need to interact with manufacturers, but also with other stakeholders like collectors and recyclers.	In literature the high costs of setting up an infrastructure that supports reverse logistics is mentioned, but not much is said about the CO2 emissions that come with the current way of transporting.	The fact that this study found barriers for space limitations, might have to do with the fact that most of the interviewed denim brands and retailers were relatively small with not a lot of office or storage space. For bigger brands and retailers this might be less of a problem.

2.2.2 Drivers for collecting and working with post-consumer (recycled) denim

Next to barriers, stakeholders also mentioned drivers that motivated them to collect denim or work with post-consumer recycled textiles. Table 6 explains the indirect and direct drivers for stakeholders to collect and work with post-consumer (recycled) denim. Fig. 10 shows the relative ranking of the drivers. As for the barriers, the drivers are not all on the same level. Some of the drivers lead to a higher motivation to collect than others. Some of the drivers are external, whereas others are internal. The most

interesting ones to tap into are external drivers that lead to high motivation. On these external drivers, we can have the most impact. These are shown in the right upper quadrant in Fig. 10.

All of the drivers were mentioned by three or more stakeholders. Table 7 shows a definition and a quote for each category, including a link to the literature.

We need to consider these drivers in the design process as concepts that are good to tap into to convince stakeholders to participate in the solution.

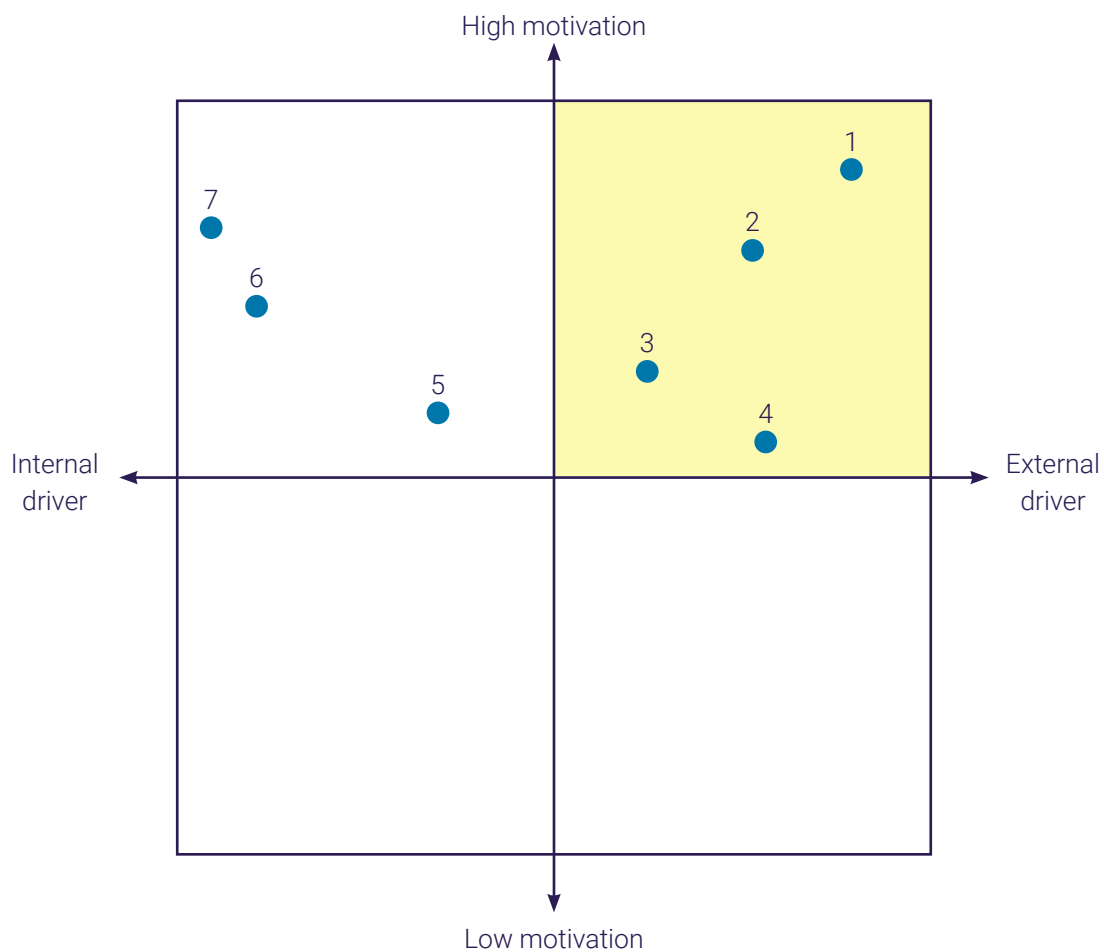


Fig. 10. Drivers to collecting and working with post-consumer recycled denim ranked on level and motivation. The yellow quadrant highlights the drivers that are most important to tap into.

Main category	Driver subcategories	Impact on
1. Legislation leads to action	D1: (Upcoming) legislation on sustainability for the industry leads to action	Brands
2. Financial incentives	D2: The Extended Producer Responsibility (EPR) will have a financial impact	Brands
3. More attention for sustainability	D3: Knowledge on and attention for sustainability is growing in the industry	All stakeholders
4. Consumer enthusiasm for sustainability	D4: Consumers are enthusiastic about sustainable initiatives	Brands & retailers (all stakeholders indirectly)
5. Being prepared for the future	D5: Being prepared for expected changes that impact the industry	All stakeholders
6. Sustainability as a marketing tool	D6: Being able to use closed loop within brand for marketing purposes	Brand
7. Intrinsic motivation to contribute to a better planet	D7: Feeling responsible for impact on the planet	All stakeholders

Table 6. Categories of drivers mentioned by interviewees that motivates them to collect and work with post-consumer (recycled) denim.

Table 7. Drivers mentioned by interviewees that motivates them to collect and work with post-consumer (recycled) denim. [On next two pages.] >>

Construct	1. Legislation leads to action	2. Financial incentives	3. More attention for sustainability	4. Consumer enthusiasm for sustainability
Definition	Legislation on sustainability imposed by the government is a driver for brands and retailers to take action. In this case the Extended Producer Responsibility (EPR) is the current driver that is mainly talked about.	Brands mention the negative financial impact if they do not comply to the EPR, but also the positive financial impact in the form of a discount if they do.	Sustainability and circularity are becoming more important topics for companies. There is more discussion about these topics and knowledge is growing.	Consumers respond positively to sustainable initiatives and show an increasing interest in sustainability.
Proof quote	<p><i>"Yes, legislation, you know that it's coming. It is better to be prepared now so that when the moment is there you will indeed also have the financial benefits."</i></p> <p><i>~ denim brand</i></p>	<p><i>"We import a lot on an annual basis, so it would mean that we have to make a nice contribution to the treasure chest of the government when it comes to the EPR. But as far as I understand, there is also a discount if you do have recycled content in your products."</i></p> <p><i>~ denim brand</i></p>	<p><i>"Well, I think when I started working here two and a half years ago, we almost didn't... We talked about circularity then, of course, but not in that much detail. So in a very short time, it has gained a lot of momentum."</i></p> <p><i>~ denim brand</i></p>	<p><i>"You see that now many consumers who come to us, they switch quite easily to a more sustainable brand. Sustainable brands are on the rise. [...] And there you just see people making clearer choices."</i></p> <p><i>~ retailer</i></p>
Link to existing literature	Policies and laws are mentioned as one of the main drivers for circular economy. They act as mandatory drivers for many organizations (Govindan & Hasanagic, 2018).	Tax benefits from the government for companies implementing CE can increase the company's willingness to become more involved in cleaner production. Also, consumers might be motivated to buy circular products if they qualify for tax benefits (Govindan & Hasanagic, 2018).	Enthusiasm to develop new knowledge is mentioned in literature as one of the drivers for circular oriented innovation and collaboration, whereas a lack of technical knowledge for CE is described as a barrier (Brown et al., 2019).	The environmental awareness of consumers puts pressure on stakeholders to become circular. Consumers are becoming more knowledgeable about industries' environmental impact (Govindan & Hasanagic, 2018).
Differentiation from literature	The interviewees mainly focus on the negative financial impacts that might follow from legislation. Also, from the interviews it is clear that good communication is needed, otherwise legislation can serve as a barrier.	The discount benefits are seen as a driver for the company, but the interviewees have not given it much thought yet what it would mean for the consumer.	From the interviews the focus is not so much on wanting to develop new knowledge, but having more knowledge available as a background for the transition to a circular economy.	From the interview insights it becomes clear that sustainability is also something that consumers can get excited about instead of only focusing on negative impact.

Construct	5. Being prepared for the future	6. Sustainability as a marketing tool	7. Intrinsic motivation to contribute to a better planet
Definition	Stakeholders want to be prepared for certain innovations that might happen, whether they are technological-, ecosystem- or legislation innovations.	Brands mention their ambition to achieve a closed loop within their own brand and express they see this as a good marketing opportunity.	Moral motivation to contribute to the wellbeing of the planet that comes from the stakeholder himself as a person or from the company itself.
Proof quote	<p><i>"As a CSR advisor, my role is to look at how we can become more sustainable and how we can use and maximize the entire circular process. What can we do with it? What is applicable now? What is something for in the future?"</i></p> <p>~ Textiles collector & sorter</p>	<p><i>[About closed loop recycling within own brand] "That is our ambition. So that we can really say 'Oh, you're wearing a jeans that has an old [own denim brand] in it.' We had a previous pilot where we only collected and recycled jeans from [city]. And that's a super cool story, but we couldn't say those were from [own denim brand]. But you do want that of course. That is super cool and also our responsibility."</i></p> <p>~ denim brand</p>	<p><i>"I think that should come from us. We design and produce every item that hangs here. Well, not without help, but we order it so we are also responsible for taking it back at the end-of-life after the consumer."</i></p> <p>~ denim brand</p>
Link to existing literature	Literature makes mention of future trends that may drive circular development, like future growth of the population and resource scarcity (Govindan & Hasanagic, 2018).	Business perception of reputation gains is mentioned as one of the drivers for circular economy in literature (de Jesus & Mendonça, 2018). However, the danger of being perceived as greenwashing is also lurking because of consumer skepticism of corporate environmental activities (Leonidou & Skarmeas, 2015).	In a case study in health care intrinsic motivation was regularly mentioned by stakeholders as driver to adopt circular activities (van Boerdonk et al., 2021). Another paper mentioned the growing sense of responsibility for sustainability, which can be a personal motive as well as an organizational one (Brown et al., 2019).
Differentiation from literature	The concept from the interviews of being prepared for the future is an overarching theme that encompasses different future trends.	Interviewees were mentioning the opportunity of having a marketing tool in the case that a true closed loop is achieved in the future. This is therefore a driver to achieve a certain future vision.	In at least two literature sources intrinsic motivation was mentioned. However, these insights were derived from stakeholders in other industries than the textile industry. This project gives evidence that this insight applies for stakeholders in the textile industry as well.

2.3

CONSUMER INSIGHTS

To learn more about the end-consumer, the student sent out a questionnaire. The results were compared to literature since the number of respondents was insufficient to receive significant results.

2.3.1 Consumer insights

39 participants responded (male & female, age = 19-85, mean age = 35). They were asked about their relation to clothing and the end-of-life of a clothing item. These first topics did not focus on denim since otherwise, it might be too difficult to answer. Then, the questionnaire asked about their relation to jeans.

When buying new clothes, consumers find a comfortable fit most important (see Fig. 11), followed by the item's durability. Literature supports the evidence that conventional clothing attributes like fit, comfort, and quality are more relevant than sustainable attributes (Rausch et al., 2021).

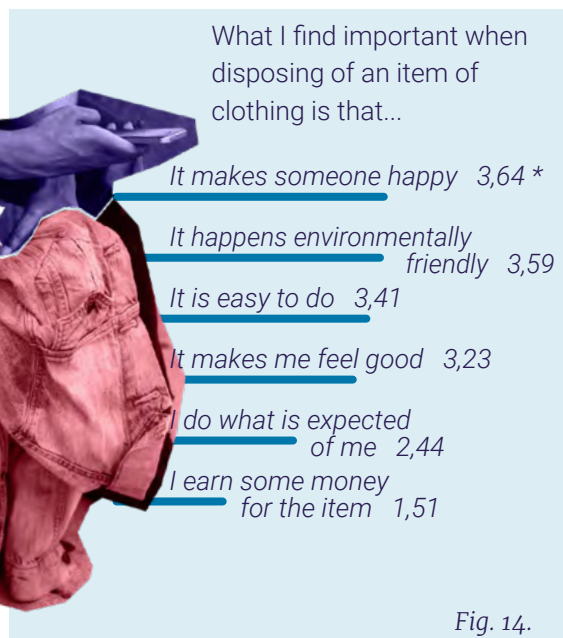
The main reason people throw away their clothes at end-of-life is that the item shows wear and tear (see Fig. 12).

At the end-of-life (see Fig. 13), the garment is mostly donated in a textiles container, whether rewearable or non-rewearable. This is a good option, however, not used by all respondents. This shows there is room for improvement in educating the consumer. This corresponds with numbers

from 2019, where municipalities collected 86 kiloton of textiles, but 174 kiloton was discarded as residual waste. In addition to that, it is estimated that each Dutch person has around 50 coats, jackets or sweaters in their wardrobe, which could be an explanation for the category of "I keep the item in my home" (Centraal Bureau voor de Statistiek, 2021).

Consumers find it most important when they dispose of an item of clothing to make someone else happy, see Fig. 14. To earn some money for the item they mention is unimportant to slightly important. This is important input, as stakeholders can use these incentives to convince consumers to hand in their denim garments. Interviewees like brands and retailers mentioned they did offer a financial incentive for making consumers hand in clothes, but charitably collectors, on the other hand, rely on the goodwill of people.

All respondents owned at least one pair of jeans, with an outlier to 15 pairs of jeans! The average respondent, however, owned six pairs of jeans. For most respondents, their main reason to wear jeans was comfortability (see Fig. 15). In other research where a more significant data sample was used (n=4617 adult consumers from Germany, Poland, Sweden, and the U.S.), the average consumer possessed six pairs of jeans as well (Gwozdz et al., 2017).



* On a 5-point Likert scale with 1= not at all important; 3= moderately important; 5= extremely important

Figure 11–15. These visualizations show the most important consumer insights from the questionnaire.



TREND RESEARCH

From talks with the client supervisors and trend reports, the researcher defined a few trends that might impact collecting and working with post-consumer (recycled) denim.

2.4.1 Trends in logistics

Trends in logistics are mainly fueled by technological innovation. Many experiments have been done in last-mile delivery, for example, drone delivery, parcel lockers or night delivery (Doi et al., 2021). Both quantum computing and the use of big data (DHL, n.d.; DHL, n.d.-a) is expected to make logistical processes more efficient and fast. These innovations are important to this project, for example, for the reverse logistics of collected clothing items.

2.4.2 Chemical recycling

Chemical recycling is a promising technology that is currently under development. This technology could result in a higher quality of recycled textiles (Fashion for Good, 2020).

2.4.3 Consumer trends

Consumer trends show a heightened interest in e-commerce (Shopify, 2020), which means this might be an interesting channel for collecting garments. Also, more consumers want brands to be socially responsible, creating an opportunity to build brand loyalty (FedEx, 2021).

2.4.4 Changes in regulations

Climate change is a direct cause for regulations imposed by governments. Of these regulations, the Extended Producer Responsibility (FashionUnited, 2021) and the European Green Deal (European Commission, 2019) will probably impact the textiles industry in the following years.

2.4.5 Societal trends

Resource scarcity is something to keep in mind (PwC, n.d.) and will most likely serve as a driver for reusing existing resources in the next years. Next to that, a tight labor market might make it difficult to find employees (Centraal Bureau voor de Statistiek, 2021b) for labor-intensive jobs, like sorting textiles. This will likely impact the logistics industry as well.

2.5

IDEAL SITUATION

All interviewees were asked about their ideal situation regarding collecting and working with PCR denim. The insights that three or more stakeholders mentioned are noted down in categories in Table 8. The constructs were then rated on having a high impact vs a low impact

and on meaning practical or systemic change. See Fig. 16 on the next page. The constructs in the right upper quadrant are most important and serve as inspiration in the design process. Table 9 explains all the constructs, including an example quote.

Main category	Ideal situation subcategories	Impact on
1. Collaboration between industry stakeholders	I1: Collaboration will happen between different stakeholders	All stakeholders
2. Sustainability is profitable	I2: Sustainability should be profitable	All stakeholders
	I3: Using a (financial) incentive to convince consumers to hand in clothes	Retailers, brands
3. Brands & retailers take care of different steps in the value chain	I4: Brands & retailers will also take care of different steps in the value chain instead of only selling	Brands & retailers
4. More transparency in the supply chain	I5: Stakeholders will need to be transparent	Brands, collectors
5. Is the future local or global?	I6: The industry needs the stakeholders located abroad	Collectors & sorters, recyclers
	I7: Local processing of textiles	
	I8: Local processing of textiles included in tender	
6. Closed loop within brands or within the industry?	I9: Closed loop within brand is preferred by some brands	Brands
	I10: Closed loop within industry is preferred by other stakeholders	
7. Chemical recycling in the future	I11: A fiber of high quality can be achieved through chemical recycling	Chemical recyclers, Yarn manufacturers
8. Different ways of collecting	I12: Collecting through a deposit system	Brands, retailers, collectors
	I13: Collecting taken care of by brand/ retailer	
9. Making use of existing logistical processes	I14: Making use of existing logistical processes	Brands, retailers, logistics partners
10. More usage of sustainable materials	I15: Use sustainable materials as resources	Brands

Table 8. Categories of the concepts mentioned by interviewees with regards to the ideal situation for collecting and working with post-consumer (recycled) denim.

2.5.1 Local vs global & closed loop

Two main questions arise: should the infrastructure for processing post-consumer denim be locally or globally and should the loop be closed within the industry or separately for each brand?

Interviewees were split on the question of local vs. global. Five interviewees mentioned a preference for a local infrastructure, whereas four interviewees mentioned the necessity of

making use of the stakeholders abroad.

For the question of closing the loop within the industry or for each brand, opinions were split as well. Some brands mentioned they preferred to close the loop within their brand, but some questioned the feasibility of the idea. Some interviewees mentioned they preferred a closed loop within the industry because they thought this was more feasible.

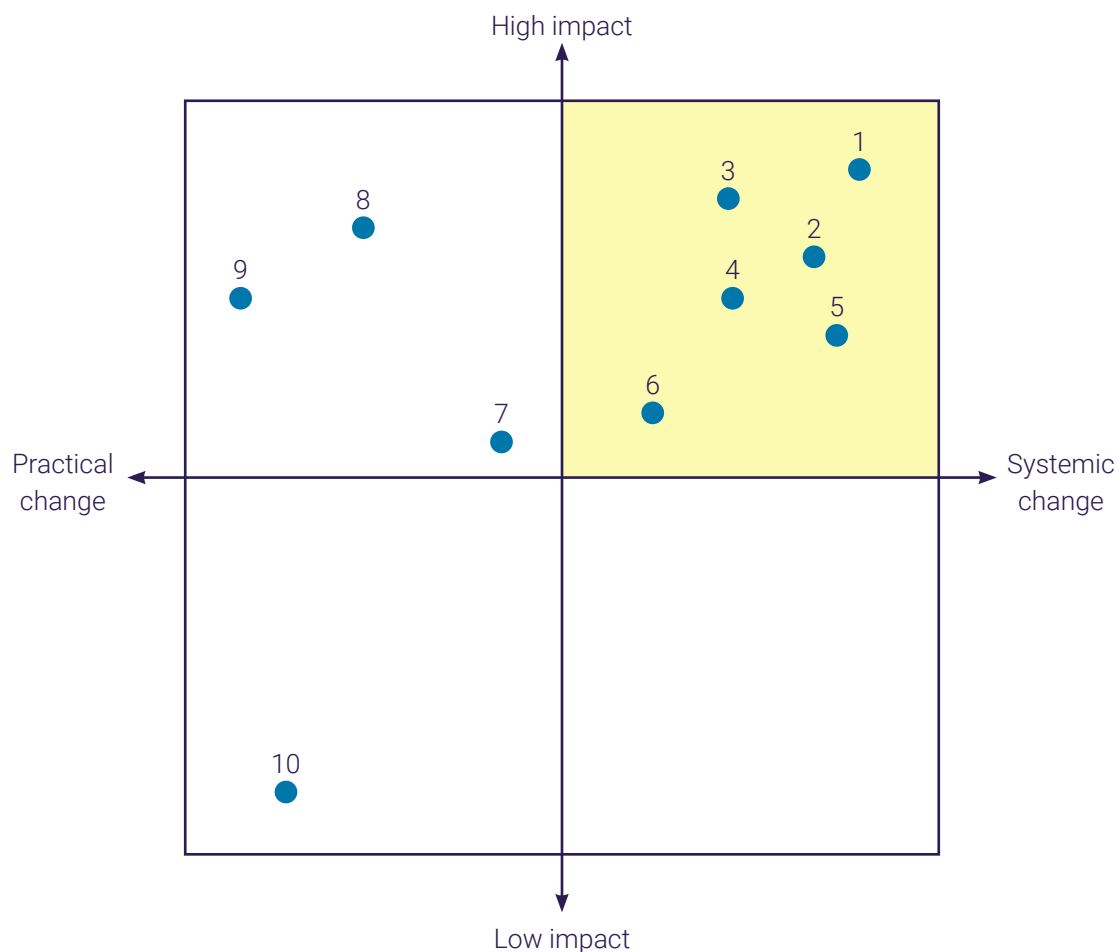


Fig. 16. The categories for an ideal situation on collecting and working with post-consumer recycled denim ranked on impact and level of change. The yellow quadrant highlights the categories that are most important to tap into.

Construct	Definition	Proof quote
1. Collaboration between industry stakeholders	Stakeholders need partners for the collecting and recycling of post-consumer garments, as they do not have the resources to do the whole process themselves.	<i>[About collecting] "So I really think that we need to start talking about collaboration. The Netherlands is already such a small country in itself and then you have all these small brands..."</i> ~ denim brand
2. Sustainability is profitable	Sustainable business should not only cost money, but also be profitable. An important factor is that collected clothes do not generate (a lot) of money now, but should have value if they are seen as resources.	<i>"You don't want to pay 6 euros per pair of pants to get it back. You actually want a slightly better business model. It must remain profitable, also to be able to continue our brand."</i> ~ denim brand
3. Brands & retailers take care of different steps in the value chain	Instead of only selling a product, brands and retailers also want to take responsibility for other steps in the value chain, like repairing, collecting, recycling and upcycling.	<i>"The best thing, actually what we are going to do now, is that you give the right jeans a second life, or a second chance."</i> ~ retailer
4. More transparency in the supply chain	More transparency is needed in showing what they do to come to a product and what happens with the product (e.g. at end-of-life).	<i>"At a certain point we found out that if you want to put a circular service on the market and you also want to take it back and fiberize it, you cannot avoid being transparent about it."</i> ~ denim brand
5. Is the future local or global?	Some ecosystem stakeholders are located in different countries. Should the processing of collected clothes happen locally or on a global scale? Insights indicate that there is a slight preference for local, but this is not always feasible.	<i>[About local] That is of course the whole idea of a circular economy: that you keep it as local as possible and that you can support local initiatives."</i> ~ denim brand/ <i>[About global] "I know that there are fiberizers in the Netherlands, but spinning mills, for example, are not located here at all as far as I know."</i> ~ denim brand
6. Closed loop within brands or within the industry?	Is it okay to close the loop of materials within the industry or should every brand close the loop for themselves? Insights indicate that even though some prefer the latter, it is more feasible to close the loop within the industry.	<i>[About closed loop within brand] "That is of course the most beautiful story and that would be the ideal world. Pilots have now been set up to ensure that we can make our own products with our own waste stream."</i> ~ denim brand/ <i>[About closed loop within industry] "If I look at viability and feasibility, I would say that something is coming where you can also recycle other [brands'] pants."</i> ~ denim brand

Table 9. Explanation on the categories mentioned for the ideal situation for collecting and working with post-consumer (recycled) denim. [Continues on next page]

Construct	Definition	Proof quote
7. Chemical recycling in the future	Chemical recycling is seen as a promising technology because the quality of the recycled fiber is better than with mechanical recycling.	<i>"There is still some future for mechanical recycling, but we need to scale up the chemical recycling as well. Because with the normal shredding technology of mechanical recycling you shorten the fiber. So it's not good enough." ~ garment manufacturer</i>
8. Different ways of collecting	Stakeholders describe different ways of collecting, like collecting through a deposit system, collecting by mail or in stores.	<i>[About handing in clothes] "It can be done online. So if you can indicate what you want to hand in. Then you will receive a shipping label. You see an indication of what you will receive for the voucher. And then you can send it right away." ~ denim brand</i>
9. Making use of existing logistical processes	The existing logistics process can be used to collect post-consumer garments. For example, if a logistics partner supplies a store, they can take back the collected items.	<i>[About collected clothes] "Well, I think with the logistics partners that come here, you could say for example, if everyone drives into the city anyway and everyone drops their old clothes here. Why not take it with you as a logistics partner so it can be picked up somewhere centrally?" ~ retailer</i>
10. More usage of sustainable materials	The focus should not only be on using recycled materials, but also on using sustainable virgin materials.	<i>"One of the learning processes within the [denim] deal is to perhaps not only focus on 100 percent cotton, but also on good bio-materials, so that you ultimately get a much more circular article that you can use again." ~ municipality</i>

Table 9. [Continuation]



SUMMARY UNDERSTANDING THE CONTEXT

After describing the project and approach, this section describes the context of collecting & the denim industry.

(2.1) Textiles collection in the Netherlands is mainly a municipality's responsibility. They grant collection rights to collectors. Collection happens mostly through textiles containers. A big part of the textiles still ends up as waste (around 174 kiloton in 2019) so there is a lot of room for improvement. Stakeholders are connected in a circular supply chain where a pair of jeans is bought by the consumer, worn, disposed of, sorted by the textiles sorted and recycled into a new pair of jeans.

(2.2) Ecosystem stakeholders encounter barriers when collecting and working with post-consumer (recycled) denim. The most important barriers to solve are clothing being treated as a waste stream; the stakeholder's scale being too small for impact; fast fashion working counteractive to circularity; encountering financial barriers; a lack of transparency in the industry; needing to convince the consumer; and uncertainties around legislation. The most important drivers to tap into are legislation leading to action; financial incentives; more attention for sustainability; and consumer enthusiasm for sustainability.

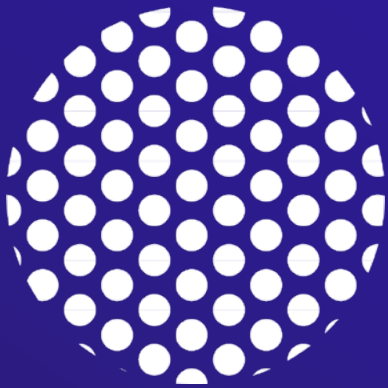
(2.3) As it turns out, consumers value a comfortable fit over sustainable attributes

when buying clothes. The main reason to throw away an item is because of wear-and tear and most often the garment is disposed of through a textiles container. Consumers value making someone else happy most when disposing of a garment. On average the questionnaire's respondents owned six pairs of jeans and their main reason for wearing jeans was comfortability.

(2.4) Trends that might impact the ecosystem first of all include trends in logistics. Secondly, chemical recycling is a promising technology. Looking at consumer trends e-commerce and consumers valuing socially responsible brands might impact the ecosystem. Regulations like the Extended Producer Responsibility will affect stakeholders just like resource scarcity and a tight labor market.

(2.5) Interviewees mentioned important aspects for an ideal situation for collecting and working with post-consumer (recycled) textiles. The most important ones to serve as inspiration are collaboration between stakeholders; sustainability being profitable, brands and retailers taking care of different steps in the value chain and more transparency. Also, there was a discussion between a local vs. global ecosystem and a closed loop within a brand or within the industry.

The next section starts with the design brief.



3. FROM RESEARCH TO DESIGN

THIS PART INCLUDES

- *3.1 DESIGN BRIEF 1.0 COLLECTION FOR BRANDS AND RETAILERS*
- *3.2 IDEATION ON COLLECTING*
- *3.3 CASE STUDY ON COLLECTION IN STORES*
- *3.4 DISCUSSIONS SESSIONS COLLECTION AS A SERVICE*
- *3.5 DESIGN BRIEF 2.0 COLLECTION AS A SERVICE*

**>> JUMP TO
CONCLUSIONS (p. 58)
OR
READ ALL >>**

3.1

DESIGN BRIEF 1.0 COLLECTION FOR BRANDS AND RETAILERS

A design brief describes the design challenge that needs to be solved in order to come to a final design solution.

3.1.1 Context for design brief

The denim industry has ambitions to make post-consumer recycled textiles the industry standard. To improve recycling, innovation is needed to scale up the collection process. The EPR-legislation will place responsibility for the end-of-life and collecting of clothing garments on producers, brands and retailers. These stakeholders are in a unique position to scale up the collection, since they are in direct contact with consumers.

Retailers and brands have started pilots to collect clothes. Bigger brands like H&M might be able to set up this infrastructure themselves, but smaller stakeholders struggle with barriers like scale, logistics and financial barriers. How can these brands and retailers connect to the already existing ecosystem and stakeholders to collect clothing garments?

3.1.2 Target group for the design solution

Brands and retailers will be impacted by the EPR-legislation and are therefore the direct target group for the design solution. However, they will need to collaborate with the other ecosystem stakeholders, including the consumer.

3.1.3 Design statement

The design statement is as follows:

Design the means for brands and retailers to facilitate collection of worn denim.

3.1.4 Design requirements

The design solution should...

- ... describe a system in which brands & retailers can collect worn denim
- ... emphasise collaboration
- ... (re)define the roles for stakeholders in the textiles ecosystem
- ... provide a solution for the most important barriers from the interviews
- ... include the most important drivers from the interviews
- ... use the constructs about the ideal situation from the interviews as inspiration
- ... include roles and advantages for the client organizations House of Denim, Retail Experts & Textiles2Textiles
- ... include a future vision and the steps on how to get there
- ... be feasible, proven by an experiment or pilot
- ... be viable and desirable

3.2

IDEATION ON COLLECTING

After the design challenge of creating the means for brands and retailers to collect worn denim, ideation started. The aim of the ideation-phase is to generate ideas and decide on which to continue with.

3.2.1 How to collect all post-consumer denim garments in 2023?

In order to come up with a clear goal for a future scenario this was the design vision:

In 2023 all post-consumer denim garments will be collected by brands and retailers to be given a new life.

In the year 2023, the EPR-legislation should come into effect which is why this year was set as the horizon.

First of all the current interaction for a consumer disposing of a pair of jeans was mapped, as shown in Fig. 17. The consumer buys the jeans from a brand or store. When he does not wear it anymore he can throw it in the trash, bring it to a collection-point or choose another option like giving it to a friend. The collector brings it to a sorter who either sends it to a recycler or to a buyer of second-hand textiles. Not all the links are shown, but in the end a percentage of the garments is likely to

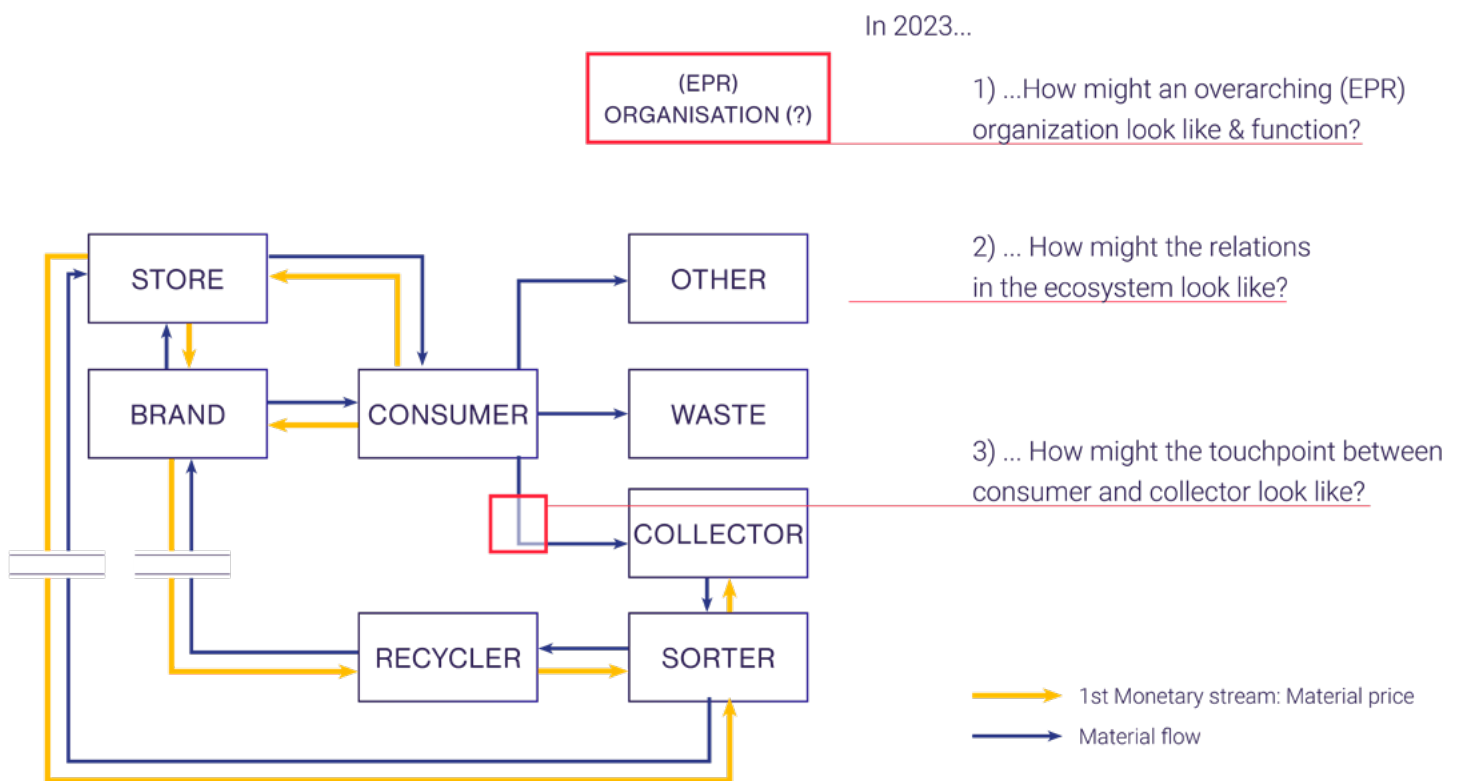


Fig. 17. Current exchange happening when consumer wants to hand in their worn jeans. On the right you find the questions used as inspiration for ideation.

find its way back to the consumer.

After mapping the current exchange, three how-to questions shaped the areas for ideation (also shown in Fig. 17):

1. How might an overarching (EPR) organization look like & function
2. How might the relations in the ecosystem look like?
3. How might the touchpoint between consumer and collector look like?

The ideation drawings are bundled in Appendix F.

3.2.2 How might an EPR organization look like?

For the first question *how might an EPR organization look like*, this study follows the current vision of the organizations working on the EPR (see Fig. 18). Levies will be paid into the

fund which is used amongst others to pay for and further develop the system for collection and recycling ([FashionUnited](#), 2021).

3.2.3 How might the relations in the ecosystem look like?

Fig. 18 shows a version of the relations within the ecosystem that is most likely and which will be used as context for the design solution. In this new version of the ecosystem which includes the EPR-fund, consumers pay deposit for each garment. Stores and brands pay this deposit and additional EPR levies to the EPR-fund. The EPR-fund in turn uses this money to pay the collectors and sorters for their efforts, to promote the concept of handing in clothes to consumers, and to pay back the deposit to the points of collection.

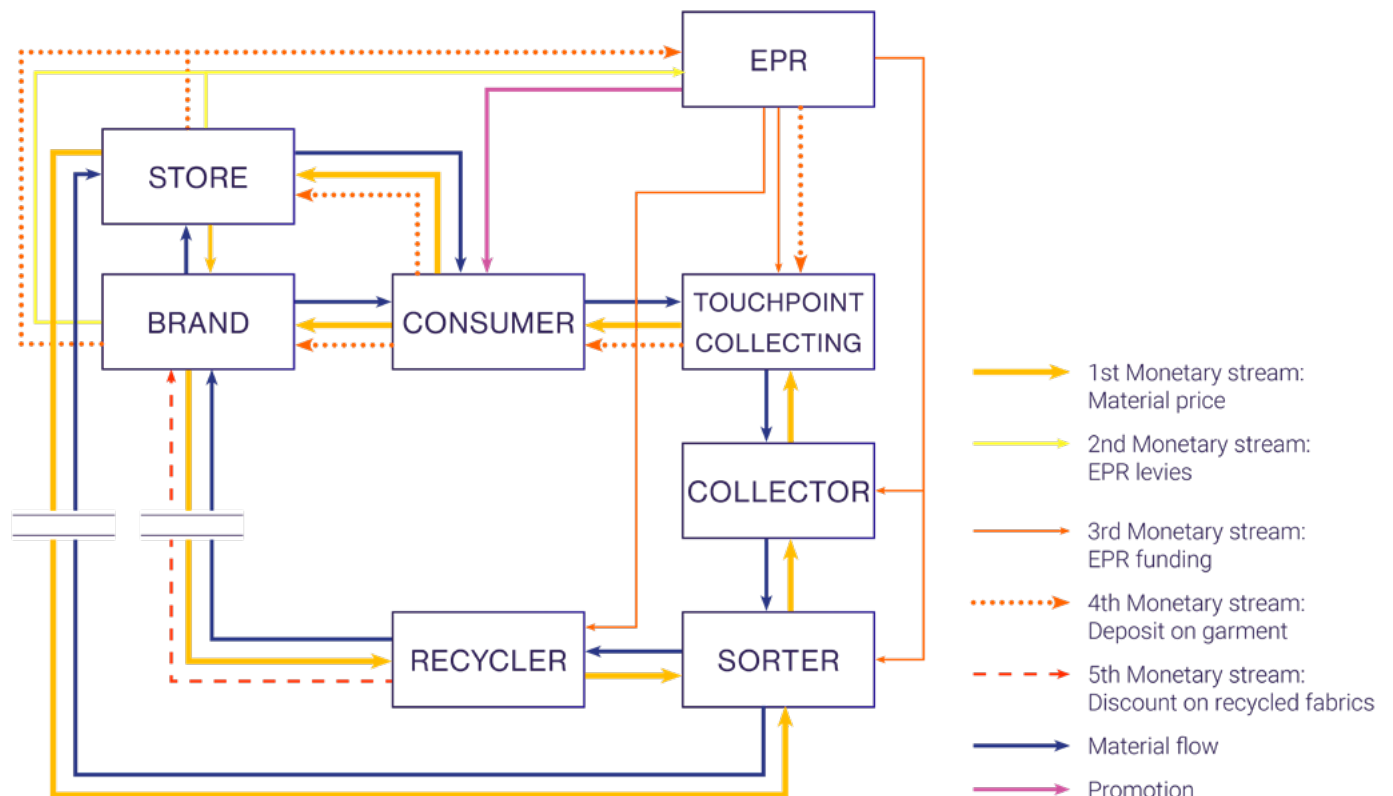


Fig. 18. The envisioned exchange happening when consumer wants to hand in their worn jeans.

Collection type		
Collection at home	 Easiest for consumer	 Dependent of consumer being at home  It is forbidden to place clothing in bags on the streets for pick-up
Collection at shopping district	 Opportunity to make use of existing network and logistical streams  Brands and retailers carry direct responsibility  Direct connection between brand and/ or retailer & consumer which creates opportunity for education  Achievable for pilot, since there is already a connection with brands and retailers	 Risk of stores needing to close because of corona  Consumer needs to remember to bring their clothes, a change in behavior is needed
Collection at circular crafts center	 Future-proof (if every material-stream needs to be circular, there is a need for one point of collection for all materials)	 This might be still one step too far for the system as it is now

Table 10. Pros and cons of collection at home, at the shopping district or at a circular crafts center.

However, for the final design solution another iteration might be necessary. Sketches for the different options for the ecosystem can be found in Appendix F.

3.2.4 How might the touchpoint between consumer and collector look like?

Ideation on the touchpoint between consumers and collector lead to multiple ideas, which were all compared to the current way of collecting with a textiles container. See Appendix G for all the concepts. In the end, three touchpoints were left that had significant advantages compared to the textiles container:

1. Collection at home
2. Collection at the shopping district
3. Collection at circular crafts center

These concepts including the pros and cons as shown in Table 10 were discussed with the

client supervisor. Collection at the shopping district was the most promising, as it showed the most advantages. Therefore, this project focuses on collection at the shopping district as shown in Fig. 19. The more detailed concepts for collection at home and at the circular crafts center can be found in Appendix H. Figure 19 shows three options within this touchpoint for collection: in stores, in second-hand stores and through market stalls. Collecting in second-hand stores is already happening. This project focuses on collection in stores, since this is a relatively undiscovered concept as not much research has been done into business models behind this form of collecting.



Fig. 19. Touchpoint of collection in the shopping street.

3.2.5 A quick round of validation

After the decision for collection in stores this concept was validated shortly with some retailers in the "9 Straatjes" in Amsterdam. The main outcomes were that the retailers showed interest, but indicated some limitations. The first limitation was that most of the shops in the 9 Straatjes did not have a lot of space for collection bins in their stores. The second was that they indicated that the consumer does not yet have a sustainable mindset. Also, some of them showed interest, but mentioned this needed to be discussed with headquarters. These are important concerns to take into account when developing a final solutions.

3.2.6 A case study to learn more about and experiment with collecting in stores

One of the interviewees during the research phase was Daan Broekman, owner of De Rode Winkel in Utrecht. He had mentioned he had already collected around 1.000 - 2.000 jeans but did not know what the next step should be. This turned out to be a perfect case study for this graduation project to study the concept of collection in stores.

3.3

CASE STUDY ON COLLECTION IN STORES

De Rode Winkel in Utrecht had already been collecting jeans in their store for quite some time. This was perfect for a case study on collection of worn denim garments in stores.

De Rode Winkel is a specialized jeans store in Utrecht. Since 2019 they collected jeans from the consumer in a big red collection bin next to the entrance, see *Img. 4*. At first, they did this for a project with denim brand Kuyichi to create jeans from recycled fabrics. They continued collecting after this project. After the collaboration with Kuyichi, they collected 869kg of jeans. This volume translates to roughly 1.100 pairs of jeans. They achieved this without significant marketing efforts and without giving a financial incentive.



Img. 4. The collection bin at the entrance of De Rode Winkel (De Rode Winkel, n.d.).

3.3.1 The case study

The case study consisted of three pillars:

1. Creating a consumer awareness campaign to find out how to incentivize consumers to hand in jeans and to collect jeans.
2. Analyzing the collected jeans and finding destinations for the jeans.
3. Designing for the bigger picture and translating this small-scale pilot into a service on a larger scale.

De Rode Winkel and the graduation student created a flow to guide consumers through handing in their jeans (see *Fig. 20*). First, the consumer is shown an ad with an incentive, he clicks on it and ends up on the website of De Rode Winkel. Here they see information about how to hand in their jeans. They can hand in their jeans in the store or send them after receiving a shipping label. They receive a discount of 10% on a new purchase in return.

Unfortunately, none of the targeted people handed in a pair of jeans and the campaign ended without any collected items. This might also be because the shops had to close due to COVID-19 restrictions. Despite this, the case study was valuable in terms of insights.

3.3.2 Consumer awareness campaign

A social media campaign tested which incentives to use to convince people to hand



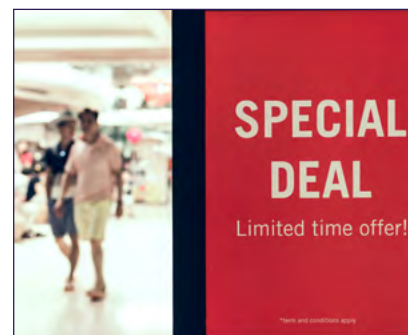
1. Consumer sees incentive through Facebook ad or mailing campaign



2. Consumer visits landing page from De Rode Winkel about handing in jeans



3. Consumer can hand in jeans at De Rode Winkel or through the mail



4. Consumer receives a discount

Fig. 20. The flow the consumer goes through after seeing and clicking on an incentive. See Appendix K for a better overview of the website.

in their jeans. The four tested incentives were:

1. Emotional incentive- addressing feelings of guilt about unworn clothes
2. Informative incentive- informing about where to hand in jeans
3. Financial incentive- giving a discount
4. Informative incentive- informing about what happens with the collected jeans

Firstly, an email campaign targeted customers subscribed to the newsletter of De Rode Winkel (n= 12.208, divided equally). Secondly, a Facebook campaign targeted consumers close to Utrecht and interested in fashion (n= 26.298).

Fig 21 shows the results of these two

campaigns (see next page). Conclusions were drawn based on a weighted average of click ratios for both campaigns. See Appendix L for the results and the calculations. Consumers showed the most interest in the emotional incentive of feelings of guilt. Informing about where to hand in old jeans came second, followed by the financial incentive. Informing what happens with the items sparked the least interest.

These results show that the emotional aspect is the most interesting to target consumers on. However, the experiment was not thorough enough to draw solid generalizing conclusions. The results serve

as important clues in which direction to look when researching incentivizing people to hand in their clothes.

3.3.3 Defining the material flows

The jeans were transported to Textiles2Textiles, where the contents were analyzed. The total volume was 869 kg.

Fig. 22 shows the volume composition



- click ratio mailing (wrt recipients)
- click ratio Facebook (wrt reach)
- weighted average

Fig. 21. Consumer engagement with the different incentives that were shown in the ads.

of the collected batch. The retailer kept some of the jeans, which was estimated to account for more or less 23%. The majority of the volume (69%) received the label "blue". This means that the quality was not good enough for reuse or repair. The sorter will sell this to a recycler. 3% Of the textiles were good enough to sell as second-hand to Dutch vintage wholesalers. 4% Was of lesser quality but still good enough to sell to second-hand purchasers for use abroad. Only 2% was waste, which will cost the sorter money to process.

A waste percentage of 2% is low. For reference: in 2020 the waste percentage of the collected volume for ReShare (collector of second-hand textiles) was 15,6% (Leger des Heils, 2021). They collected this through textiles containers, stores and associations. This difference makes collection in stores all the more interesting.

Finally, the sales revenue for the sorter was calculated, see Table 11. The sales price for the sorter was €0,35/ received kilo for this batch of garments. However, had the retailer not taken out a portion of the good jeans, it could have been €1,31/ received kilo. This is a significant difference to the disadvantage of the sorter. Processing this batch of collected garments resulted in a loss for the sorter. See Confidential Appendix A for the detailed calculations.

For the retailer, collection in stores is interesting, since they can attract more customers, build customer loyalty and sell some jeans second-hand. De Rode Winkel expects to sell them for €75- €100/ pair. The

initial plan was to test this within the graduation project, but this idea was abandoned since all stores had to close due to corona restrictions.

3.3.4 Showcase & the bigger picture

In conclusion, collecting garments in-store is interesting for the retailer, but not profitable for the sorter. This does not mean this way of collection is not feasible, just that a different approach to the business model is needed.

Therefore, in the next chapter, collection as a service is introduced. With this service, the sorter gets paid compensation and both parties have the advantages of collecting in stores. Two discussion sessions with stakeholders were set up to discuss this idea. The next section describes the discussion sessions.

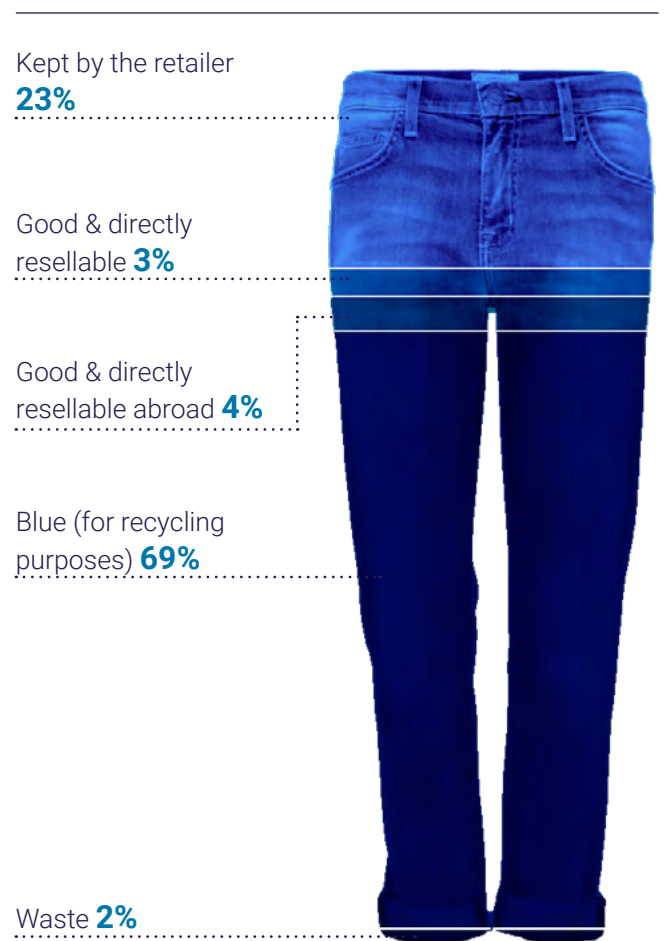


Fig. 22. The volume composition of the collected jeans from De Rode Winkel.

Sales price/ kg (€)	Sales revenue excl. kept by retailer (€)	Sales revenue incl. kept by retailer (€)
Total	€ 236	€ 1.136
Price/ kg for sorter	€ 0,35	€ 1,31

Table 11. The sales revenue for the sorter according to the volume.

3.4

DISCUSSION SESSIONS COLLECTION AS A SERVICE

The graduation student facilitated two online discussion sessions with stakeholders to develop collection as a service. The aim was to give an update on the case study and development of CaaS, receive feedback and define the next steps. In the second session, the stakeholders agreed to start a pilot in Amsterdam. This pilot directly results from this thesis. The execution of the pilot falls outside the graduation project's scope.

3.4.1 Insights from discussion session #1

The participants of the first discussion session were the owner of De Rode Winkel, the owner of a transport company and the client supervisor from RE. This session resulted in insights on transport, like reverse logistics and how to execute “swaps” for each box with collected denim. Secondly, we received insights into the advantages for the retailer, like the opportunity to attract new customers and build on customer loyalty. We can use these advantages to convince retailers and brands to participate. This session led to a new design brief (see Ch. 3.5), which describes the challenge of evaluating CaaS. Appendix M shows part of the brainstorm session.

3.4.2 Insights from discussion session #2

For the second session, the client supervisor from House of Denim, the owner of the transport company and the director of a sorting

company joined. See Confidential Appendix B for the notes of this meeting. In this session, we discussed the execution of a large-scale pilot. All stakeholders, including both client organizations, were enthusiastic about collaborating on a pilot in Amsterdam. This pilot aims to anticipate on the EPR, learn about the system for collecting denim on a larger scale and make stakeholders and consumers enthusiastic about creating a closed-loop and show them that it is possible. This pilot will start after the graduation project is over in Q2 of 2022 and the aim is to implement collection as a service.



Fig. 23. The intention is to start a pilot for denim collection in Q2 in 2022 in Amsterdam.

3.5

DESIGN BRIEF 2.0 DEVELOPING THE BUSINESS CASE OF COLLECTION AS A SERVICE

This chapter is an iteration of the first design brief in chapter 3.1 and shapes the design challenge for collection as a service (shortened as CaaS).

3.5.1 The why

The aim is to facilitate the collection of denim for brands and retailers who will be impacted by the EPR and to implement CaaS.

3.5.2 Design challenge

The design challenge is to develop the business case and concept of collection as a service for RE, T2T, CHASE, HoD and partners. The objective is to draw conclusions on the proposition's desirability, feasibility, and viability and to decide on a go/ no-go to pursue this project.

3.5.3 Project scoping

The scope of the challenge is the business case of collection as a service (CaaS).

Process- The process includes: incentivizing the consumer to hand in worn clothes; facilitating collection at store level; transporting the clothes to a collection hub; sorting & processing of the items; and it ends after having sold the material to external parties.

Material- The business case will focus on denim to assess desirability, feasibility and viability.

3.5.4 Project deliverables

The project deliverables are the following:

1. Conclusions on the viability, desirability and feasibility of CaaS leading to a go-/ no-go of pursuing this business case
2. A clear description of the concept of CaaS
3. The business model and ecosystem map for CaaS
4. A horizon planning on how to implement CaaS
5. A description of the impact on the textiles industry ecosystem & set of recommendations

3.5.4 Design approach

The approach includes:

1. Setting up a case study for collecting in-stores (*as described in ch. 3.3*) between De Rode Winkel & T2T and learn from the findings
2. Two discussion sessions about CaaS lead by graduation student (*described in ch. 3.4*)
3. Validating discussions between master student, T2T & Retail Experts about the concept and the financial aspects. For the financial details, an excel will be used as discussion object
4. Validating interviews with potential users of the service by graduation student
5. Validating discussion(s) between master student & logistics company about feasibility & viability for transport



SUMMARY

FROM RESEARCH TO DESIGN

(3.1) After the research phase, the design brief describes the design challenge as: to design the means for brands and retailers to facilitate the collection of worn denim.

(3.2) This challenge was the starting point for ideation on three questions. 1) How might an overarching EPR organization look like and function?- Textile producers, brands & retailers will pay levies into a fund used to pay for collection and recycling. 2) How might the relations in the ecosystem look like?- The consumer pays a deposit per garment to a store or a brand. They, in turn, forward this deposit and EPR levies to the EPR fund. When the consumer does not want the garment, he brings it to a collection point and gets his deposit back. The garment is forwarded to a collector, then a sorter, and either sold to a recycler or a second-hand buyer. 3) How might the touchpoint between consumer and collector look like?- The consumer hands in the garment in a clothing store. This creates an opportunity to educate the consumer and use existing networks and logistical streams.

(3.3) Collection at De Rode Winkel was studied to learn about collection in stores. Consumers were targeted through social media. They could hand in their jeans in the store or send them with a shipping label. Unfortunately, no extra jeans were collected, but the case study did lead to new insights.

First of all, providing the consumer with an emotional incentive (addressing feelings of guilt) leads to the most engagement. Informing about where to hand in jeans came second, followed by a financial incentive and lastly by informing what happens with the jeans.

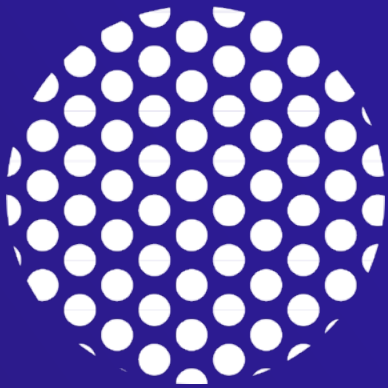
The majority of the collected volume from De Rode Winkel (69%) should be recycled. 7% could be sold as second-hand and there was a low waste percentage of 2%. The retailer kept some jeans of better quality to sell them in the store (23%). This led to a sales price of €0,35/ collected kg for the sorter, which would have been €1,31 had the retailer not kept some jeans.

All in all, collecting in stores was interesting for the retailer, but not profitable for the sorter. Therefore, the thesis introduces collection as a service to take a different approach to the business model.

(3.4) During two discussion sessions, stakeholders discussed the concept of CaaS and practical execution for a pilot.

(3.5) The second version of the design brief redefines the design challenge as: to develop the business case and concept of collection as a service.

The next part of this report will describe the final design for CaaS.



4. FINAL DESIGN COLLECTION AS A SERVICE

THIS PART INCLUDES

- *4.1 THE COLLECTING COLLECTIVE*
- *4.2 HORIZON PLANNING*

**>> JUMP TO
CONCLUSIONS (p. 71)
OR
READ ALL >>**

All denim clothes deserve a new life and it is the responsibility of the fashion industry to achieve this. No denim belongs in the trash bin, even those items with holes. Let's collect in all stores for circular fashion!

For the consumer who... *doesn't know what to do with that pile of jeans in the back of their closet*



For the denim textiles producer, brand & retailer who.. *wants to build circular streams & prepare for the EPR*



Are you a denim producer/ brand/ retailer with physical stores & want to participate?

Price/ collected kilo €0,19+ starting fee of €400

High quality material? You receive a discount!

- 😊 Attracting new customers
- 😊 Option to sell second-hand items
- 😊 Preparing for EPR
- 😊 Discounts on recycled fabrics
- 😊 Participating in green initiative

Contact [anne](#)



4.1

THE COLLECTING COLLECTIVE

This chapter explains the final design solution of the Collecting Collective which provides collection as a service (CaaS) for brands and retailers to collect in stores. T2T will function as the service director.

4.1.1 The Collecting Collective: collection as a service

The Collecting Collective facilitates in-store collection for brands and retailers in the denim industry. Fig. 24 on the left shows how the service works. The consumer hands in one or more denim garments at a connected clothing store. The brand of the garment does not matter. In return, he receives a discount voucher of 10%. The retailer puts the item in a bin at the counter. In a later stadium of the service, he can preselect some of the garments at the counter, which he places in a separate bag. The retailer indicates when the collection bin is full

by scanning a QR code. Inside the collection bin, there is a cardboard box that is swapped with an empty one. The collected garments are transported to a hub first and then to a sorting facility. Here they are sorted and prepped for the next step in the value chain based on the quality of the garment. In a later horizon, the preselected garments can be washed and repaired if needed. The retailer would then pay an additional service fee for these items to resell them as second-hand in their store. The brand or retailer receives a discount on recycled fabrics through the Collecting Collective.

Fig. 26 on the next page shows the journey of the garment. Depending on the quality and value of the garment, it might end up on the second-hand rack in the store, in a second-hand store in the Netherlands or abroad, or it will be recycled.

Fig. 25 shows the core activities of the

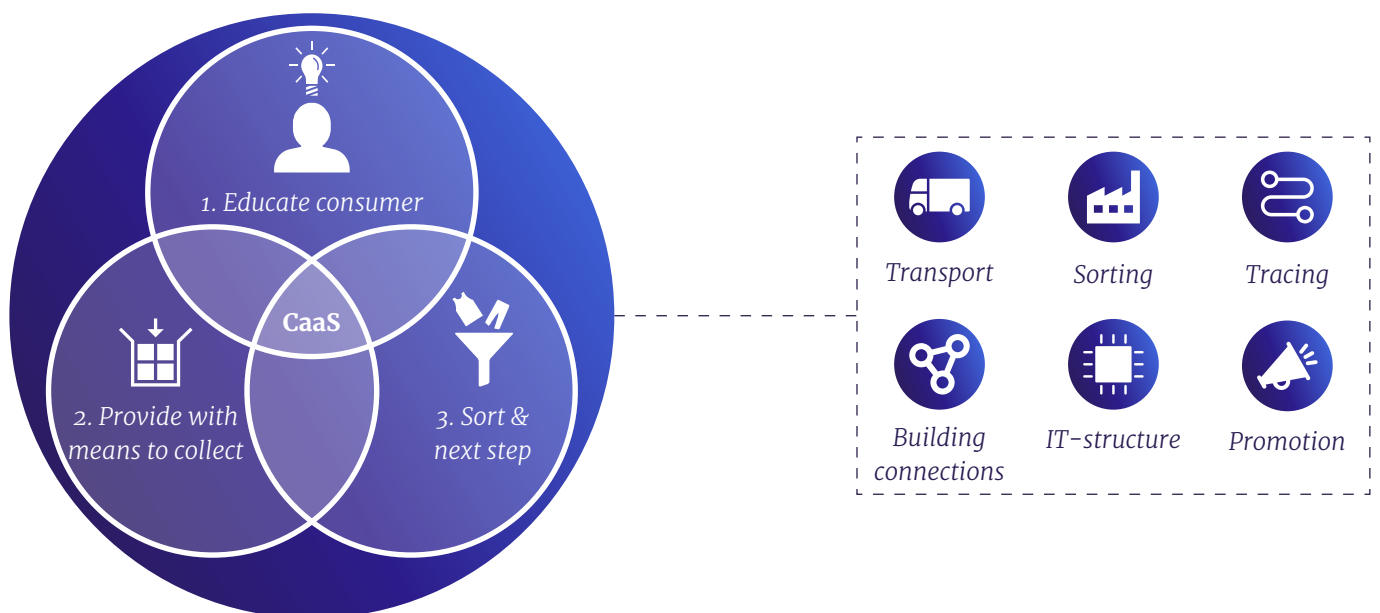


Fig. 25. The three core activities of the Collecting Collective and the supporting activities.

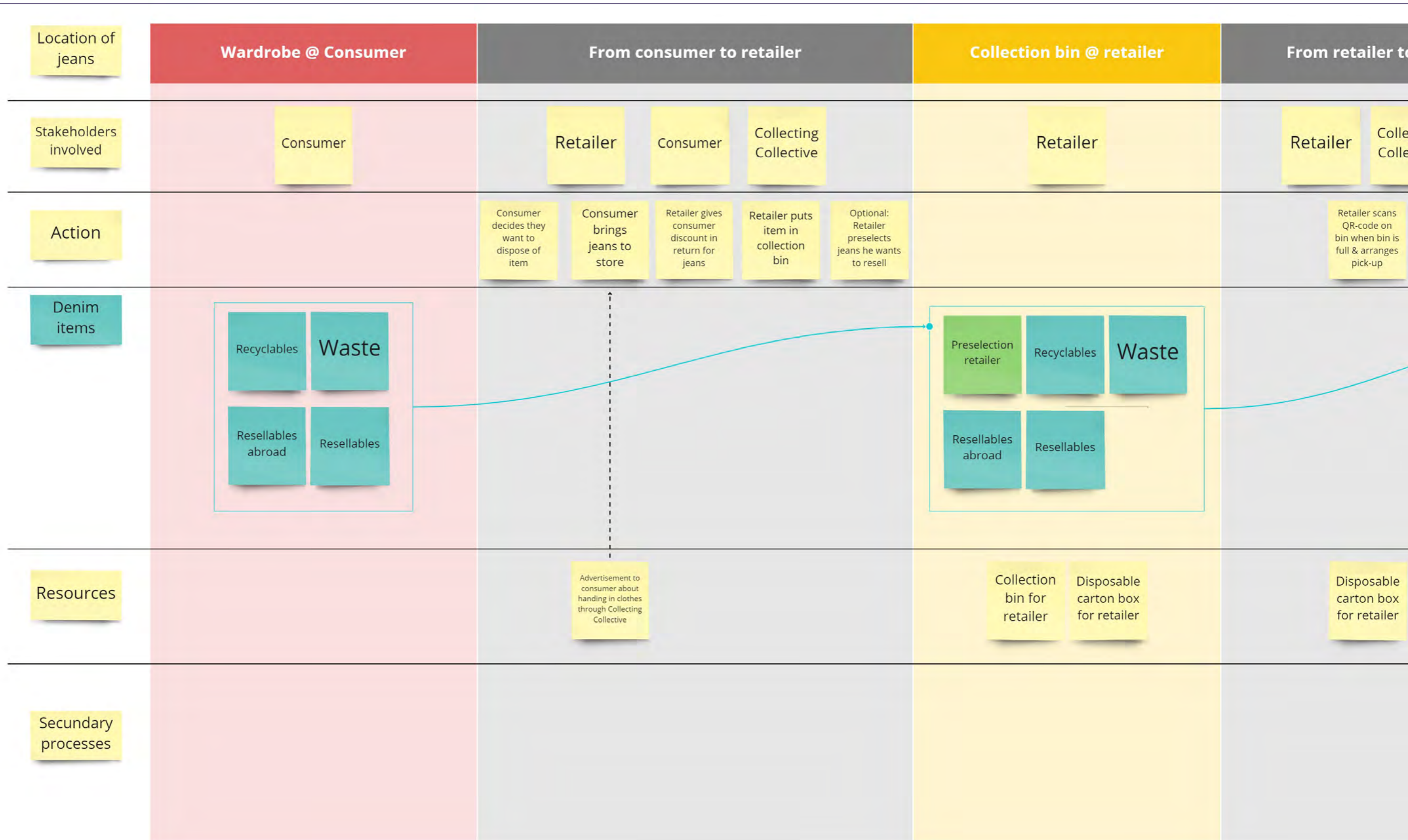
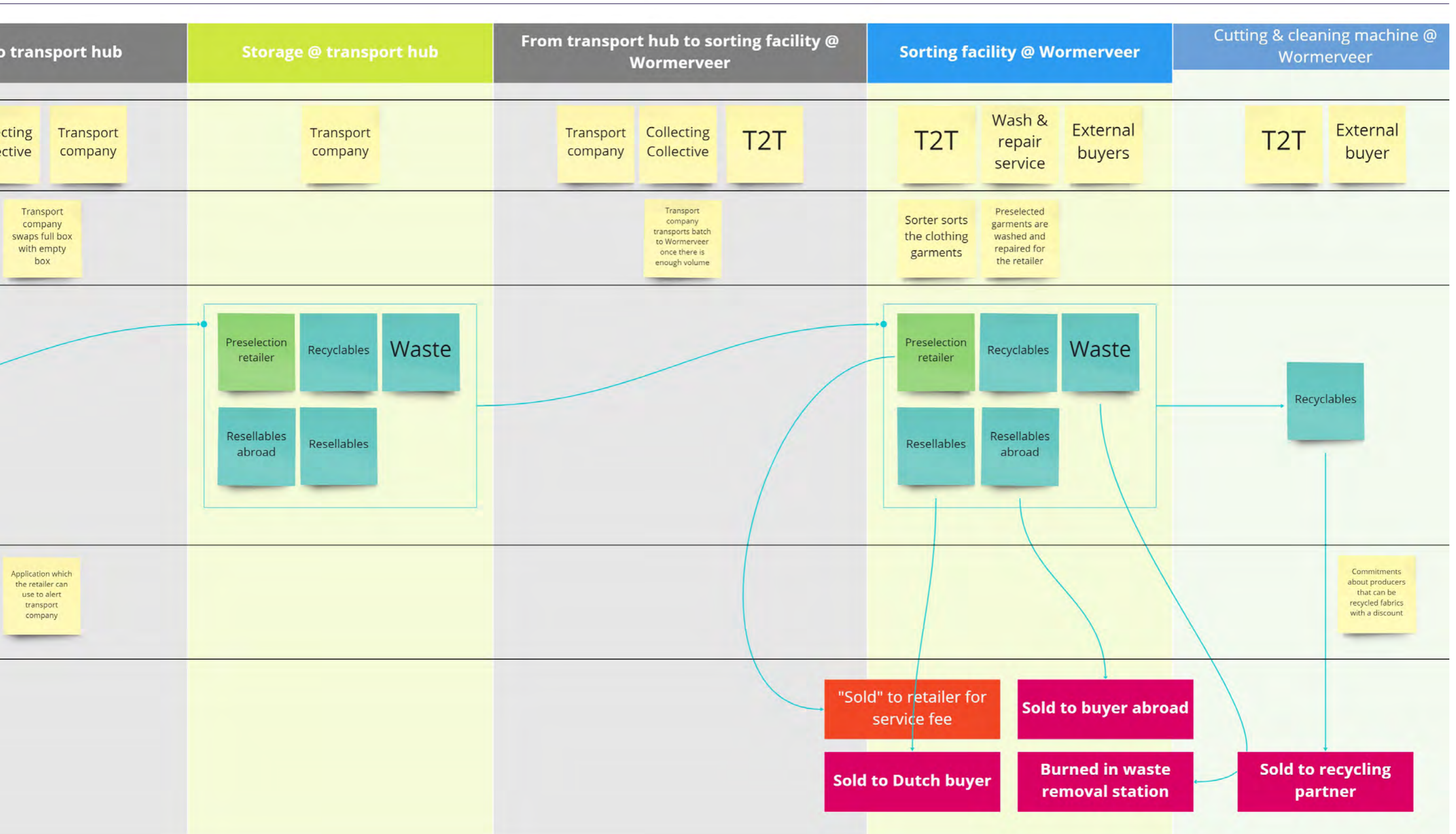


Fig. 26. An overview of the customer journey of a clothing garment going through the proposition of collection as a service.



Collecting Collective, which are: 1) educating the consumer on how to contribute to a circular fashion by handing in garments; 2) providing brands and retailers with the means to collect clothes in stores; 3) sorting the garments and passing them on to the next step in the supply chain. Supporting activities include building connections with textiles producers, transportation, sorting, tracing, promoting and providing the IT structure.

4.1.2 The target groups of the Collecting Collective

The Collecting Collective is a B2C as well as a B2B initiative. The initial B2B target group consists of denim brands and retailers. The EPR will force them to take care of collection of garments and the Collecting Collective provides for this need. The early adopters of this service are denim brands and retailers with sustainability on their agenda, operational in The Netherlands. In addition, they need to have physical stores and operate in the middle

to upper segment. The service will target all clothing brands and retailers in a later stadium and might extend to online retail later.

The B2C target group of the Collecting Collective consists of all consumers, just like all consumers are expected to dispose of glass separately. Figure 27 shows the customer journey. The the environmentally-conscious shoppers will be the early adopters. With a good story, they are expected to be convinced more easily than other consumers. In the end, the discount serves as a financial incentive to convince also the non-environmentally-conscious consumers.

4.1.3 The Collecting Collective within the ecosystem

The Collecting Collective can exist both in an ecosystem with- and without an EPR. Fig. 28 on the right shows an overview of the relations in the ecosystem before the EPR-regulations take effect (top figure) and the changes in relations with the EPR (bottom figure). In the

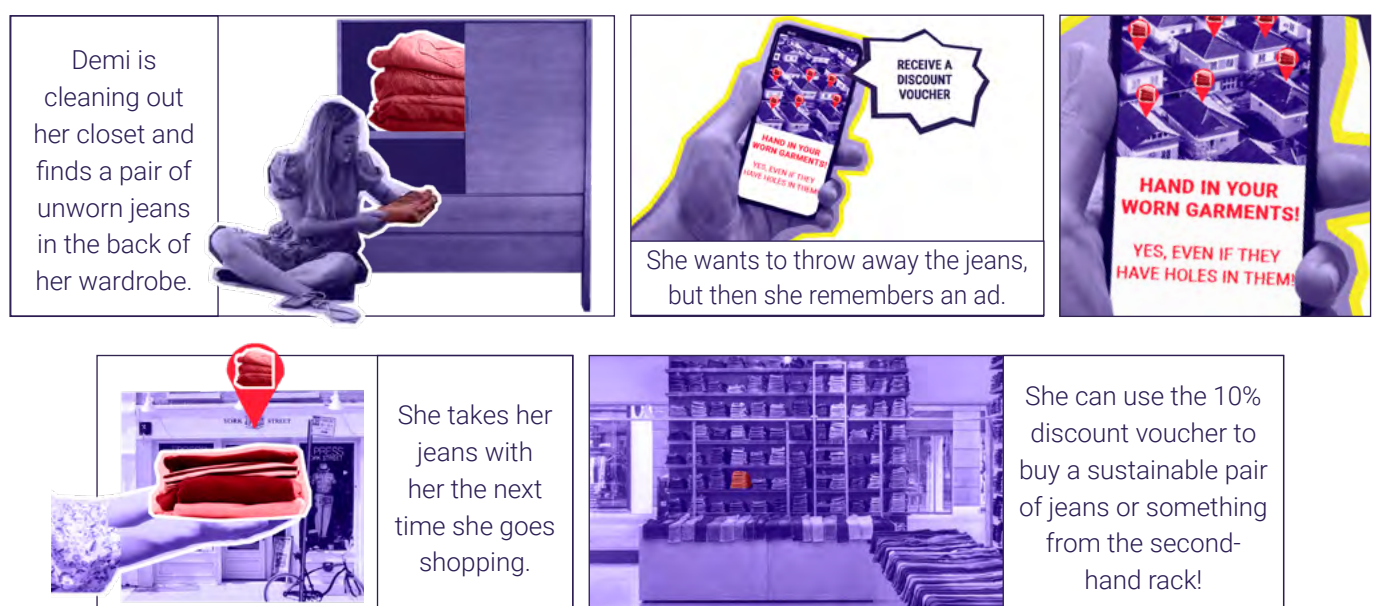
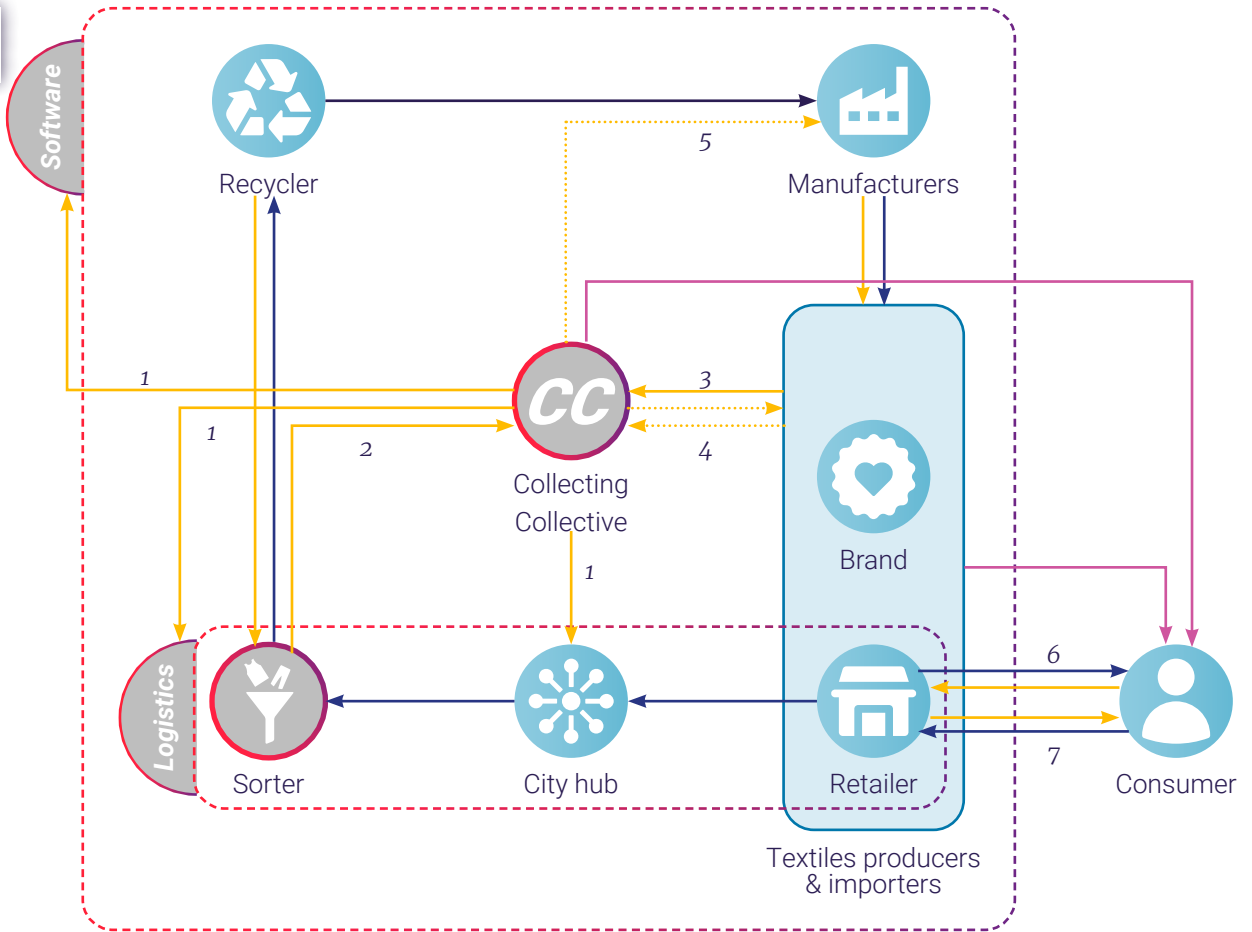
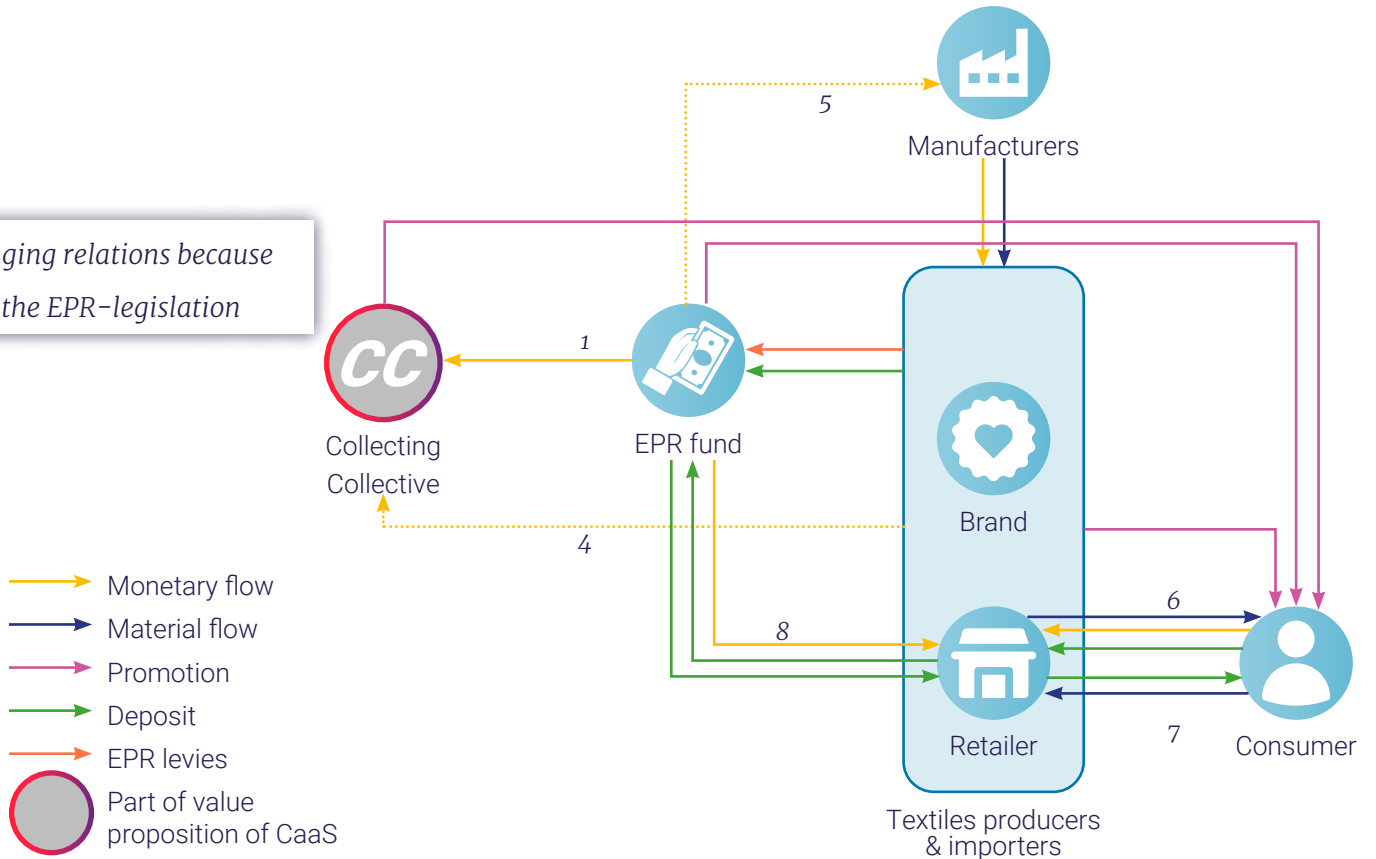


Fig. 27. The customer journey for the end-consumer.

Before EPR



Changing relations because of the EPR-legislation



- 1) Pay for service
- 2) Material revenue
- 3) Fixed connection fee
- 4) Kilo price and possible discount
- 5) Agreements on material discounts
- 6) Purchase of garment (including deposit in EPR system)
- 7) Handing in garment, consumer receives discount (& deposit in EPR system)
- 8) Pay out

Fig. 28. Overview of the Collecting Collective within the ecosystem of the textiles industry. The top figure shows the situation without the EPR-legislation. The bottom figure shows how some of the relations change with the EPR-legislation.

first situation, a brand or retailer pays a fee per collected kilo to the Collecting Collective. The material is transported from the retailer to a city hub to a sorter and finally ends up at the recycler. This figure focuses on recycling, the flow for rewearable garments differs slightly. When the EPR comes into effect, these relations might change. The implications of the EPR are not entirely clear as of now. One of the possible scenarios is that the Collecting Collective will be paid from EPR funds instead of by brands and retailers directly, as shown in Figure 28.

This ecosystem does not include the municipalities. They are currently deciding who owns the right to collect textiles and earn revenues from textiles collection. This changes in the envisioned ecosystem. Previous sector plans also indicate a changing role for municipalities (INretail et al., 2019).

4.1.4 Desirability of the Collecting Collective for brands and retailers

The service aims to solve the barriers for brands and retailers to collect denim. Appendix O shows an overview of all the Collecting Collective's advantages to solve the barriers found in the research phase. The most important advantages are:

- 😊 Brands and retailers are prepared for the EPR.
- 😊 Brands and retailers with limited resources do not have to set up their own infrastructure.
- 😊 The service costs money, but brands and retailers receive indirect value through customer loyalty and attracting new customers. Later they have the option to resell clothes.

“Everything has a price. The EPR as well. If you can offer a service that will give you an advantage for the EPR, and that service is cheaper than the disadvantage of the EPR, then you’ve got it!”

~ Denim brand responding to the concept

The service was validated with three brands. The first brand thought it was an exciting proposition if it can provide a solution or an alternative for the EPR. The second brand was critical. They mentioned they had the scale to create a closed loop themselves. Therefore, for bigger brands it might be better to position the Collecting Collective as a partner instead of a service. The third brand showed interest in the concept and was prepared to participate in the pilot.

4.1.5 Desirability of the Collecting Collective for the end-consumer

The concept was validated with five end-consumers, see Appendix Q for the validation session and notes. When shown the concept, first of all, they responded positively to having more insight into the process. Some mentioned a higher perceived environmental friendliness of this collection method because of this. Some responded skeptically to the discount, but others mentioned it could be a good incentive. In these interviews, people responded positively to the Collecting Collective as an addition to the existing collection methods. However, the service could be improved if consumers could hand in a bag of mixed garments instead of denim only. This was a

small sample of interviewees. The consumer's perspective should be explored more in a pilot.

4.1.6 Feasibility of the Collecting Collective

To implement the Collecting Collective, partners and resources are needed. The service is initiated by T2T as the service director. For the execution of a pilot, other stakeholders have been brought together, including Retail Experts, House of Denim, CHASE, a logistics company, a charitable collector and De Rode Winkel. T2T can take care of the sorting process, RE will build connections with retailers and brands and CHASE can provide the software layer. House of Denim plays a role in educating the consumer and in forming connections with the industry. It is possible to create a minimum viable version of the service with these partners. This minimum viable version will be implemented in a pilot in Amsterdam that will start after the graduation project.

Several connections still need to be filled in, such as the link with the parties involved in the EPR and tracing technology. There are multiple stakeholders in the Denim Deal that can fulfill these roles. Brands can also be targeted through this network. Finally, the Collecting Collective needs an advertising agency.

In the end, the most critical challenge to solve within the Collecting Collective is the logistical side of the service. Therefore, the service could collaborate with multiple logistics partners to create an efficient logistical network and innovate together.

4.1.7 Viability of the Collecting Collective

We calculated the business model from

the perspective of the sorter to learn about the viability. See Confidential Appendix C for the detailed calculations and Appendix N for the business model. For the value proposition to be attractive, the collected volume should at least be 500.000kg. Currently, 169KT (1KT= 1.000.000kg) of textiles ends up in household waste (FashionUnited, 2021). This number takes all textiles into account, not just denim. Nevertheless, if we can collect 0,3% of that volume, we will already achieve our goal of 500.000kg.

First, we calculated how much sales revenue we needed for a healthy operational profit margin of 9% for collecting 500.000kg denim/ year. See Confidential Appendix C.2 for the break-even calculations. An operating profit margin of 9% is reached when each kilo results in €0,89 revenue. The revenue from the material is built up out of two streams:

$$\begin{aligned} & \text{kilo price for brand/ retailer for CaaS} + \\ & \text{kilo price for buyer of textiles} \\ & = \text{total sales price/ kilo} \end{aligned}$$

After sorting, the sorter sells the material to a buyer. The kilo price depends on the quality of the material. From the case study at De Rode Winkel we found a minimum revenue of €0,35 and a maximum of €1,31. We assume we can sell the material for a similar price, which we skew a bit towards the lower side: €0,70. To reach the needed €0,89 revenue/ kilo, the brand or retailer will need to pay an additional €0,19/ collected kilo.

For the first two years, there will be a loss for this business case. However, once the volume of 500.000kg is reached in year 3, the

proposition will be profitable, see Confidential Appendix C.4. The calculations rely on assumptions of which these are the most important:

- The sorter's sales price for the collected denim is €0,70/ kilo.
- The transport costs are €20,-/ swap but will go down to €8,-/ swap once we reach a volume of 500.000kg.
- A store location will collect 1.500kg in year 1, 3.000kg in year 2 and 3.500kg in year 3.
- On average, in year 1, we will have 35 store locations, in year 2 60 and 145 in year 3.

All the assumptions are noted in Appendix P.

4.1.8 Costs for brands and retailers

Brands and retailers pay a fee of €0,19/ kilo and a connection fee of €400,- for the placement of the collection bins and connection to the service.

Two factors play an essential role in the business model: material quality and transport. Therefore, we want to prevent brands and retailers from plundering and we want to do swaps for a volume of 80 kg or higher. Therefore, there is a reward system (see Figure 29). There is a discount if the quality exceeds the limit. On the other hand, an extra fee will be asked if the material quality is below a certain

limit. The same goes for collecting: Collection of two full boxes (80kg) is free, but swapping one full box costs €10.

4.1.9 Competitor analysis

In the last three years, the offer of similar services has grown. Although most of these initiatives are in the early start-up phase, some of these have scaled up in recent months. See Confidential Appendix D for the competitor analysis. The main competitive disadvantage for the Collecting Collective is that the service is not free, unlike some of the other initiatives. However, in the business model, the cost is calculated so that the service will be free if the material prices increase. We think this makes for a fair business model for all stakeholders, which is viable in the long run. The main competitive advantages are: collaboration with trustworthy industry stakeholders that can facilitate all aspects of a circular loop; a marketing budget to attract and educate consumers; discount on recycled fabrics; and a fair business model.

4.1.10 Risks for the Collecting Collective

There are some risks to this business case. First, the Collecting Collective's success depends on the EPR. However, by doing this



Fig. 29. The costs for the participating brand or retailer.

research, there is an opportunity to shape the EPR. Secondly, it is forbidden to collect household waste without a permit from the municipality. However, since the collection happens in private stores, this is not applicable to the Collecting Collective. Companies like H&M (H&M, n.d.) and Hema (Wolkat, n.d.) also collect in stores without facing legal repercussions.

4.1.11 Implementation: a pilot in Amsterdam

Within this graduation project, the client organizations decided to continue with the concept of the Collecting Collective. A pilot to implement the service in Amsterdam is in the making!

4.2

HORIZON PLANNING

There are three horizons for the Collecting Collective. The first horizon (H1) focuses on offering CaaS for denim garments. In H2, CaaS is offered for all garments. In the third horizon (H3), the aim is to merge the service with the EPR-system.



4.2.1 Offer CaaS for denim (Pilot)

Now - end of 2022

Stakeholders will collaborate on a pilot for denim collection in Amsterdam. The project brief for the pilot is already written (see Confidential Appendix E. We can iron out all the inconsistencies with the pilot before offering CaaS on a national scale and for all garments. Also, it would be best to start conversations with the EPR organizations here already.

4.2.2 Offer Collecting Collective to all brands & retailers



End 2022 - start of EPR

After testing CaaS in a pilot in Amsterdam, we will offer CaaS to all brands and retailers. This requires a new pilot since assumptions used for the collection of denim might be different for the collection of all garments.

4.2.3 Merge Collecting Collective with EPR-system



Start of EPR (2023?) - 2024

When the EPR-regulations come into effect, CaaS should merge with this system. Since the legislation is not

finalized yet, Collecting Collective has the opportunity to exert influence by setting the example on how to collect. The start year for the EPR-system is now set as 2023, but this might be delayed.

4.2.4 Bridging the gap between CaaS for denim garments vs. all garments

Collection as a service might look different for all textiles garments. First of all, the research in this thesis focused on the denim industry. It did not look into the differences and similarities between the denim- and the textiles industry in general. For example, denim brands are aware of the EPR, but are all brands? Secondly, the business model for CaaS is different for all materials. We estimate that the quality of the material will go down if all materials are collected. Then the price for the sorter will drop, meaning that extra funding is needed. Thirdly, the potential collected volume goes up when collecting all textiles. This will stress the system more, but at the same time, allows for expansion of the Collecting Collective. Next to that, industry experts mentioned that people might feel more emotionally connected with a pair of jeans than with a pair of socks. This might influence how much effort people want to take to hand in a garment. At the same time, the emotional connection can be used as a storytelling element. Chapter 5.3 gives recommendations to explore CaaS for all materials.



SUMMARY

FINAL DESIGN CAAS

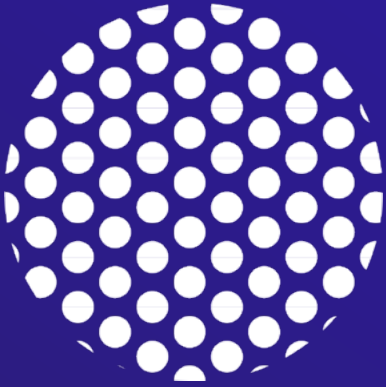
The final design for collection as a service follows after the ideation phase.

(4.1) The Collecting Collective offers collection as a service (CaaS) to brands and retailers to collect in stores. Textiles sorter T2T is the service director. The consumer hands in their denim garments at a connected denim store and receives a 10% discount. The retailer scans a QR code once the collection bin is full, after which the logistics company will "swap" the box. The batches are sorted and sold to the appropriate buyer in the supply chain. The three core activities of the Collecting Collective are 1) educating the consumer; 2) providing brands and retailers with the means to collect; 3) sorting the garments and passing them on in the supply chain. The service will first exist in a system without EPR. In the future, the Collecting Collective however might be paid by the EPR fund. The service is validated as desirable by brands if it can provide a solution for the EPR. For bigger brands and retailers it would be better to position the Collecting Collective as a partner instead of a service. The Collecting Collective was desirable by consumers, but it could be improved if all textiles can be handed in. All the resources to make the service feasible are available either through CHASE, HoD, RE, T2T and the partners

that joined in the discussion sessions, or through stakeholders in the Denim Deal. CaaS is viable if the brand or retailer is prepared to pay a price per collected kilo of €0,19 and a starting fee of €400,-. In return, they receive a discount on fabrics with recycled content. They also receive a discount on the kilo price if the quality of the collected material exceeds a certain limit. The success of CaaS is dependent on the efficiency and the costs of the logistical network. If assumptions and risks can be managed, collection as a service is a viable, desirable and feasible concept to continue with.

(Ch. 4.2) The horizon planning includes three horizons. In the first, the Collecting Collective offers CaaS to denim brands and retailers. A pilot will start in Amsterdam. On the second horizon, the service is offered to collect all garments. For this, new experimentation is needed. In the third horizon, the service should be merged with or adjusted to the Extended Producer Responsibility system. Since the legislation is not finalized yet, there is an opportunity to exert influence.

The next part describes the conclusion, recommendations, discussion and personal reflection.



5. CONCLUSION, DISCUSSION, RECOMMENDATIONS, REFLECTION

THIS PART INCLUDES

- *5.1 CONCLUSION*
 - *5.2 DISCUSSION*
 - *5.3 RECOMMENDATIONS*
 - *5.4 PERSONAL REFLECTION*
-

5.1

CONCLUSION

This graduation project proposes the concept of the Collecting Collective to service brands and retailers with garment collection in stores.

The first and second research questions were to identify the current ecosystem and stakeholders for post-consumer denim collection. Currently, collectors contracted by the municipality collect garments, mainly through textiles containers. When bought, a pair of jeans enters a cycle of being worn, disposed of, sorted and, in the ideal situation, recycled at the end-of-life. The Collecting Collective can exist in an ecosystem with- and without the EPR. The textiles collector is a logical partner for the service. However, in this concept there is no role for the municipality.

The third and fourth research questions focused on the barriers and drivers for collecting and working with post-consumer (recycled) denim. The three most impactful barriers were: clothing treated as a waste stream; a company's scale that is too small for impact; and fast fashion being counteractive to circularity. The Collecting Collective provides solutions for the first two barriers, but the last one requires a system's shift. The three drivers that

provided the most motivation were: upcoming legislation (the EPR); financial incentives resulting from the EPR; and growing attention for and knowledge on sustainability. The Collecting Collective takes these into account.

The fifth research question asked about the ideal situation. Stakeholders' answers with the most impact and requiring systemic change were: a need for collaboration; sustainability being profitable; and new responsibilities for brands and retailers. These constructs are included in the Collecting Collective.

The design solution focuses on the brands and retailers, because they will experience the most changes because of the EPR. The main challenges in this value proposition are the logistics, which will determine whether the concept will be successful. The value proposition, the business model and the pilot that will start after the graduation project might inspire the final implementation of the legislation.

The Collecting Collective answers the original question of finding a new way of (denim) collection and fits the future landscape of the EPR and the needs of the brands and retailers.

5.2

DISCUSSION

This chapter describes the impact, contributions, and the limitations of this thesis.

5.2.1 Impact of the Collecting Collective

The Collecting Collective will impact the ecosystem in multiple ways. First of all, with the Collecting Collective the retailer gains responsibilities not only in collecting but also in educating the consumer. Secondly, a shift in the consumer's mindset is needed to dispose of garments responsibly. Thirdly, the municipality can not earn revenue from textiles collection in this collection system. In addition, it is likely that in this system second-hand items become more expensive, further widening the gap between the poor and the wealthy consumer.

5.2.2 Contributions

This thesis contributes to knowledge and practice in multiple ways. First, it sets out the concept of store collection as a desirable, feasible and viable value proposition. This is not a new method of collection. However, this thesis gives new insight into making this form of collection viable. In this way, hopefully, the thesis will take away some of the skepticism towards collecting textiles. By including stakeholders' perspectives like the sorter's, collector's, retailer's and logistics partner's, the calculations become more reliable. The next step is to execute the concept in a pilot to show the possibilities. Experimenting is essential in transitioning to a circular industry. The thesis also adds value by describing how this collection

method can be a part of the ecosystem as a whole. This provides organizations working on the EPR with valuable insights into how the legislation can support circular initiatives. In addition, collection as a service contributes to a circular economy by enabling the scaling up of textiles collection, which result in the scaling up of recycling. This contributes to the ambitions of the Denim Deal.

5.2.3 Limitations

The first significant limitation of this thesis is that the research and the design do not apply only to denim garments. The second limitation is that the consumer plays a vital role in the final design solution, but consumer insights from the research were limited. Next, the online retailer is excluded in this concept of CaaS, even though e-commerce is a booming business. In the ideation phase the student did look into collecting through return packages as this takes the least effort for the consumer. In the case study, people could download a shipping label. However, this collection method was decided to be too costly, which was acknowledged by other interviewees as well. It would be interesting to look at how CaaS can include the online retailer in the future, but this would be a second business case that needs the logistics perspective. Lastly, another limitation is that the student's opinions may have colored the outcomes, for example, when placing responsibility for the collection touchpoints on clothing retailers.

5.3

RECOMMENDATIONS

This chapter describes recommendations for the fashion industry in general, for the organizations working on the EPR and for pursuing the Collecting Collective.

5.3.2 Recommendations for the fashion industry

The recommendations for the fashion industry to phase out the linear system are:

- 1. Collaborate more closely with the logistics industry-** The viability of a collection method is mainly dependent on the logistical network. Therefore, the industry benefits from innovations in logistics.
- 2. Experiment with circularity-** Short-term collaborations help try out business models or technologies. Initiatives like the denim deal provide a platform for this, but the danger of endless discussions without taking action is lurking.

5.3.3 Recommendations for the EPR

These are the recommendations for the organizations working on the EPR:

- 1. Create discounts in the levy system for sustainable or circular efforts-** Different discount scales should be used, so textiles producers & importers always have a new goal.
- 2. Put direct responsibility on the industry instead of indirect responsibility-** Stakeholders should not only pay for the collection system, but also actively take part in it. This way they understand the consequences of their

“Brands are going to have to set aside a lot of money to seriously clean up their own mess.”

~Textiles sorter

own (design) decisions. They should also be familiar with the difficulties in sorting and recycling certain textiles.

3. Discuss the role of municipalities- As of now, the collection system is unsustainable with municipalities earning profits on textiles collection.

4. Run a marketing campaign aimed at the consumer- The consumer plays an essential role in collecting textiles.

One more thing to consider is that the consumer will most likely indirectly pay for some of the EPR levies. What consequences does this have?

5.3.2 Recommendations for the Collecting Collective

The recommendations for the Collecting Collective are:

1. Explore inclusion of online retailers- The online retailer is not included in this concept of CaaS. If the service could be expanded to serve this target group as well, an even bigger consumer audience can be reached. When exploring this opportunity, the perspective of a logistics company should be used from the beginning.

2. Explore fiscal and juridical aspects of the concept- For example, fiscal and juridical consequences must be taken into account when handling returned goods and repricing garments in stores.

3. Educate the retailer to do the first sorting at the counter- In this way they can also preselect clothes of their own brand.

4. Explore alternatives to collection bins- Not all retailers have the space for a big collection bin. Those retailers can use other collection methods, like washing bags.

5. Research how to incentivize the consumer- The social media experiment in the case study was a good start, but this needs more exploration.

6. Run a marketing campaign aimed at the consumer- The success of the Collecting Collective depends mainly on the consumer. Firstly, the emotional connection with jeans can be used in storytelling. This emotional connection can also be used for other materials.

7. Give brands and retailers discounts on recycled fabrics- This way, they are incentivized to participate in the Collecting Collective and work with PCR fabrics.

When applying CaaS to all garments instead of only denim, this thesis has the following recommendations for further research:

1. Probe if the same barriers, drivers and ideas about an ideal situation apply to clothing brands in general- This thesis focused on denim only.

2. Take another look at the calculations for the business model- This can be done in collaboration with a textiles collector. They have knowledge of the quality of the material and the sales price for the collection of all garments in stores.

3. Ensure that retailers are not overloaded with garments- If the collected volume goes up, we need to ensure that the logistics system can handle multiple swaps per week. Another option would be to encourage people to hand in their garments at a collection hub if they exceed a specific volume limit.



5.4

PERSONAL REFLECTION

Doing a graduation thesis during a pandemic was not what I had imagined starting at the faculty of Industrial Design Engineering. However, I learned from my MSc courses that designers are resilient (just not when it comes to big changes or suddenly spending hours on Zoom). During all this, I landed my dream project and got the opportunity to work on making fashion more sustainable. I also got to work with a team of highly knowledgeable and inspiring mentors.

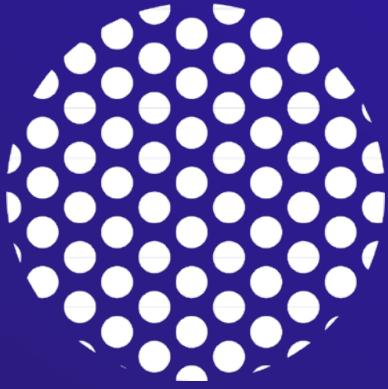
The following two semesters, I spent full time on my graduation project researching and designing for the ecosystem for collecting post-consumer denim.

What I enjoyed most was interviewing industry stakeholders. The people I met all had different and exciting perspectives. Also, they all had one thing in common, just like me: a drive for a more sustainable industry. Some of the interviewees were optimistic, some of them were more pessimistic. I took a proactive attitude in organizing mentor meetings and contacting the interviewees. During the project's design phase, I noticed that it was challenging to work from home a lot. Without input from my fellow students or inspiration from having new experiences, it was difficult to advance in the project. I

was stuck for a while but then collaborated with De Rode Winkel in Utrecht. This helped in making the project and the challenge tangible again. The discussion sessions to receive feedback on the project were helpful and started the conversation on continuing collection as a service outside of the boundaries of the graduation project.

In the end, the Collecting Collective is the result of this graduation project. I am especially content with the calculations on the viability of the proposition, as in my opinion, it really shows what is needed to make this form of collection viable. This graduation project also led to a pilot, which will most likely kick off in March or April. With this pilot we can show the industry that collection in stores is possible and we can make them enthusiastic by using denim in storytelling elements.

I learned a lot about the denim- and the fashion industry during this project. Also, this was the first big project dealing with stakeholders under my own responsibility. I learned about stakeholder management and project management. I can surely improve in some aspects, for example, by being a bit more stern during facilitation sessions or meetings. I look forward to doing that in a role somewhere in the fashion industry.



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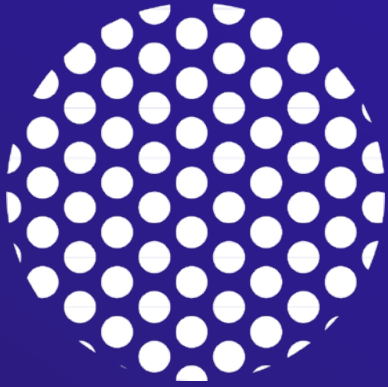
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APPENDIX

-
- *A: INITIAL PROJECT BRIEF*
 - *B: INTERVIEW GUIDE*
 - *C: INTERVIEW EXAMPLE*
 - *D: CODES FROM ATLAS.TI*
 - *E: QUESTIONNAIRE*
 - *F: DRAWINGS IDEATION*
 - *G: DATUM METHOD*
 - *H: DETAILED CONCEPTS*
 - *I: CREATIVE SESSION*
 - *J: STORYTELLING*
 - *K: WEBSITE CASE STUDY*
 - *L: RESULTS CONSUMER CAMPAIGN*
 - *M: DISCUSSION SESSION 1*
 - *N: BUSINESS MODEL CAAS*
 - *O: ADVANTAGES*
COLLECTING COLLECTIVE
 - *P: ASSUMPTIONS*
 - *Q: CONSUMER VALIDATION*
-

A: INITIAL PROJECT BRIEF

IDE Master Graduation

Project team, Procedural checks and personal Project brief

This document contains the agreements made between student and supervisory team about the student's IDE Master Graduation Project. This document can also include the involvement of an external organisation, however, it does not cover any legal employment relationship that the student and the client (might) agree upon. Next to that, this document facilitates the required procedural checks. In this document:

- The student defines the team, what he/she is going to do/deliver and how that will come about.
- SSC E&SA (Shared Service Center, Education & Student Affairs) reports on the student's registration and study progress.
- IDE's Board of Examiners confirms if the student is allowed to start the Graduation Project.

! USE ADOBE ACROBAT READER TO OPEN, EDIT AND SAVE THIS DOCUMENT

Download again and reopen in case you tried other software, such as Preview (Mac) or a webbrowser.

STUDENT DATA & MASTER PROGRAMME

Save this form according the format "IDE Master Graduation Project Brief_familyname_firstname_studentnumber_dd-mm-yyyy". Complete all blue parts of the form and include the approved Project Brief in your Graduation Report as Appendix 1 !



family name Jacobs
initials _____ given name Anne
student number xxxxxxx
street & no. xxx
zipcode & city xxx
country xxx
phone xxx
email xxx

Your master programme (only select the options that apply to you):

IDE master(s): IPD Dfl SPD

2nd non-IDE master: _____

individual programme: _____ (give date of approval)

honours programme: Honours Programme Master

specialisation / annotation: Medisign

Tech. in Sustainable Design

Entrepreneurship

SUPERVISORY TEAM **

Fill in the required data for the supervisory team members. Please check the instructions on the right !

** chair Erik Jan Hultink dept. / section: DOS/ MCR
** mentor Rebecca Price dept. / section: DOS/ MCR
2nd mentor James Veenhoff (House of Denim) & Peter Rijken (Retail Experts)
organisation: House of Denim & Retail Experts
city: Amsterdam & Oosterhout country: Netherlands

comments (optional) Chair & mentor work together on external project that includes HoD, making it easy to collaborate. Their knowledge and experience is broad so team still benefits from different perspectives even though they are from same dept.

Chair should request the IDE Board of Examiners for approval of a non-IDE mentor, including a motivation letter and c.v..



Second mentor only applies in case the assignment is hosted by an external organisation.



Ensure a heterogeneous team. In case you wish to include two team members from the same section, please explain why.

APPROVAL PROJECT BRIEF

To be filled in by the chair of the supervisory team.

chair Erik Jan Hultink date - - signature _____

CHECK STUDY PROGRESS

To be filled in by the SSC E&SA (Shared Service Center, Education & Student Affairs), after approval of the project brief by the Chair. The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total: _____ EC

YES all 1st year master courses passed

Of which, taking the conditional requirements into account, can be part of the exam programme _____ EC

NO missing 1st year master courses are:

List of electives obtained before the third semester without approval of the BoE

name _____ date - - signature _____

FORMAL APPROVAL GRADUATION PROJECT

To be filled in by the Board of Examiners of IDE TU Delft. Please check the supervisory team and study the parts of the brief marked **. Next, please assess, (dis)approve and sign this Project Brief, by using the criteria below.

- Does the project fit within the (MSc)-programme of the student (taking into account, if described, the activities done next to the obligatory MSc specific courses)?
- Is the level of the project challenging enough for a MSc IDE graduating student?
- Is the project expected to be doable within 100 working days/20 weeks ?
- Does the composition of the supervisory team comply with the regulations and fit the assignment ?

Content: APPROVED NOT APPROVED

Procedure: APPROVED NOT APPROVED

comments

name _____ date - - signature _____

Ecosystem innovation to bring worn denim back into the loop _____ project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date 06 - 09 - 2021 _____ 07 - 02 - 2022 _____ end date

INTRODUCTION **

Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

The Netherlands has set ambitious targets for transitioning towards a fully circular Dutch economy by 2050. One of the industries aiming to be more sustainable is the denim industry as denim has a huge environmental impact. In October 2020 the Denim Deal was signed by key players which includes agreements for more re-use of post-consumer recycled (PCR) textiles in new denim garments.

Bringing back denim into the loop

Worn denim is currently collected in "textielbakken" in cities or consumers can return used jeans in a selection of stores. However, the business model for collecting textiles is under severe pressure. Only a small amount is bought for re-wearing purposes, but a big part goes into warehouses or into the gray circuit. Collectors of worn denim have no clear idea on what to do with the collected garments, since there is not really an infrastructure in place supporting the reversed flow of denim back into the system. The aim is to design for an ecosystem that does support this flow, so that denim fibers can be used as a resource in newly produced denim garments.

Ecosystem Innovation & Stakeholders

Ecosystem innovation will be essential to the project, since the problem is too complex to be solved by just one stakeholder. This assignment contributes to the Denim Deal and therefore the Denim Deal will be one of the main stakeholders in the project. Other parties that have signed the Denim Deal, like Textiles 2 Textiles, brands like Kings of Indigo and MUD Jeans and the Ministry of Infrastructure and Water Management, are equally important. What do the different stakeholders need from each other to be able to collect PCR denim efficiently and what happens next? Especially important to this project are House of Denim, represented by James Veenhoff, and Textiles 2 Textiles, represented by Peter Rijken, both part of the Denim Deal. James and Peter will act as client mentors for this project.

Pilot

Something that is very important to me is that at the end of my project my research can be translated into practical steps for implementation of my design. Therefore I am aiming to design a pilot or MVP in Amsterdam to test out the designed collection system which can be used as a first case study. I will actively engage stakeholders in advance to gain traction for the pilot. However, the limited time that I have for my graduation project needs to be taken into account.

Opportunities & Limitations

Opportunities include learning from existing case studies; creating a system that focuses on collaboration; listening to eager stakeholders and asking them what they need to succeed; and building on the work for House of Denim of fellow students like Lieke van Raan. Limitations might be encountering too much competition in the denim industry; having difficulty to gain enough traction to make a lasting impact; and having difficulty understanding the complex network of stakeholders.

space available for images / figures on next page

PROBLEM DEFINITION **

Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

Problem definition

The denim deal is an international collaboration and aims to make post-consumer recycling of textiles the new industry standard. To help achieve this there is a need for an infrastructure that brings a clean stream of fibers back into the loop. Currently, denim brands, retailers and textile collecting agencies have no clear idea on what to do with collected denim garments and there is no clear profitable business model. The goal is to create a blueprint for an ecosystem where stakeholders collaborate so that collected denim can be reused, repurposed or recycled.

Research question

How can we create an ecosystem where a clean stream of denim can be brought back into the loop in order to be reused, re purposed or recycled.

Subquestions/ issues

The subquestions include: who are the current stakeholders in the denim industry relevant to this project?; what do they need in order to contribute to a solution?; what is the current way of ecosystem and infrastructure?; what are the interesting case studies (from other industries) that might serve as inspiration?; what function can a pilot serve in making implementation more attractive?; how can the designed system be rolled out on a larger scale?

Scope

To narrow down the scope of the project the city of Amsterdam will be used as focus, since many stakeholders are located here and since Amsterdam is known for being "the denim city".

ASSIGNMENT **

State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

I am going to do research on how to set up an ecosystem that provides an infrastructure for bringing worn denim back into the loop. For this I will design a pilot to bridge the gap between design and implementation. I will design a value blueprint and a minimum viable footprint for the ecosystem.

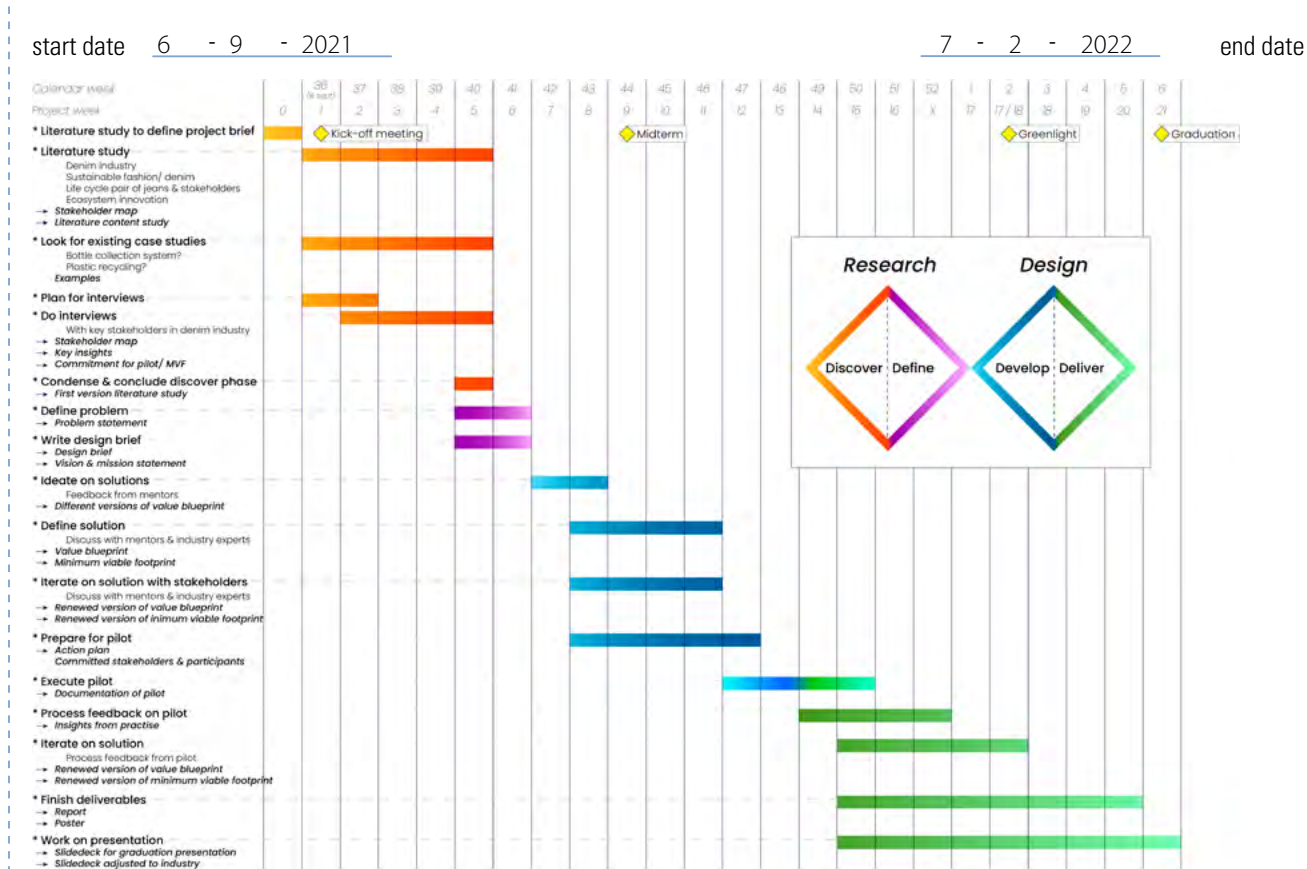
I expect to design a value blueprint and a design for a minimum viable footprint that represents the ecosystem that is needed in order to bring back worn denim into the loop. In addition to that I will design an infographic that explains how the process takes place.

The pilot that will be executed during the project can function as an example of the execution of the proposed ecosystem, but it will more likely serve as inspiration since the design will probably need adjusting after testing.

In addition to this, I wish to deliver an understandable slide deck to explain the project to industry stakeholders.

PLANNING AND APPROACH **

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.



- Kick-off meeting beginning of calendar week 36 (Sept 6th 2022)
- Midterm evaluation 1-5 Nov
- Green light meeting 10-14 Jan
- Handing in deliverables at end of calendar week 5 (e.g. Feb 4th 2022)
- Graduation date 7-11 Feb

- 2 weeks vacation in total: week 52 (Christmas & New Year's Eve) & 6 days that can be divided throughout the project

introduction (continued): space for images



image / figure 1: The Denim Deal was signed in Oct 2020 with James Veenhoff (middle) as part of the alliance.

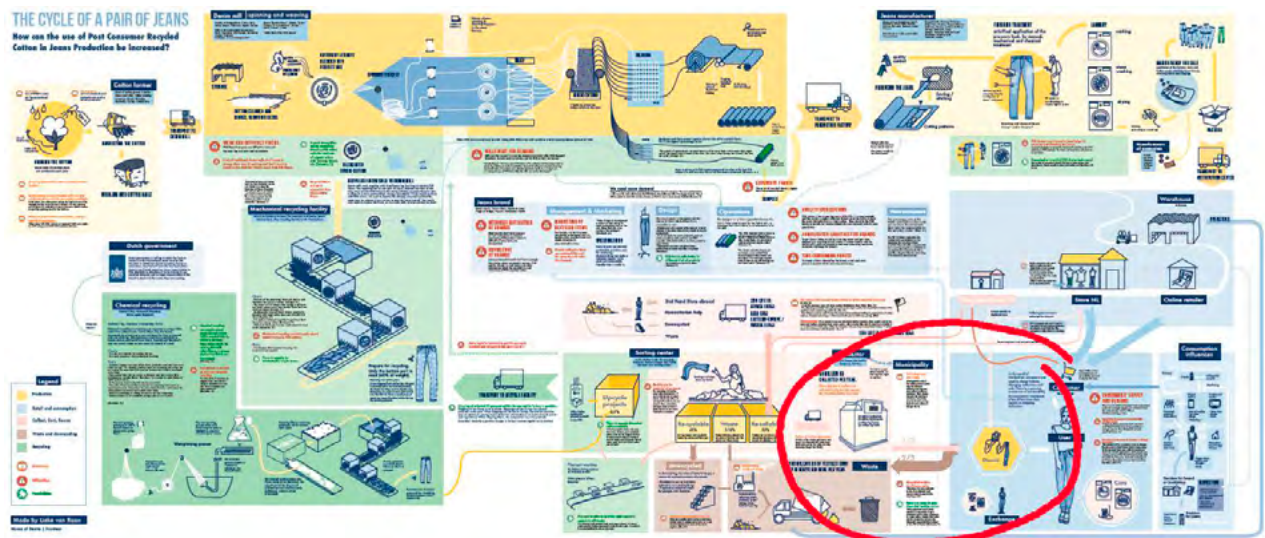


image / figure 2: Lieke van Raan's infographic about the cycle of a jean. The red circle marks the collection phase.

MOTIVATION AND PERSONAL AMBITIONS

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, Stick to no more than five ambitions.

I set up this project because I have a personal interest in sustainable fashion and I see this assignment as a good extension of the SPD MSc programme. In the past few years I have educated myself on the topic of sustainable fashion and I have taken electives on sustainable design. This project is my way of showing what I can do as a strategic designer and at the same time hopefully contributing to a more sustainable industry.

Competences (to improve)

Competences I already have, but want to improve are being a strategic designer focusing on sustainability; handling stakeholder management; being a (good) facilitator; making design explicit early on in the process and working with experiments or MVP's. Most of these competences I have either learned during the SPD master programme or during my internship at Innovation Booster (strategy consultancy). In addition to that I want to learn more about ecosystem innovation, a topic I haven't explored elaborately yet.

Personal learning ambitions

My personal learning ambitions are to gain more in-depth knowledge about the denim and clothing industry. Also, I want to explore job opportunities in this industry and define for myself what kind of job I want to have after my graduation.

FINAL COMMENTS

In case your project brief needs final comments, please add any information you think is relevant.

B: INTERVIEW GUIDE

Topics

Getting to know each other

- What is the connection between your company and denim?
- What role do you have in the company?

Situation now

- What is the situation now with regards to collecting?
- What role does party X have in this situation?
- What are the struggles they are facing?
- What are the opportunities they see?

Future situation

System

- What are their ambitions towards collecting?
- What do they think is the ideal way of collecting?
- What are the obstacles they (would) encounter?
- What are the opportunities they see?

Roles

- Would their role change?
 - o If so, what will their new role be?
- What do they need for this new role?
 - o Who else needs to innovate/ change their role?
 - o Who else needs to adopt their innovation?
- In this changed system, who would have the role of leader?

Who do I want to interview & how many?

Who do I want to interview? A cross-section of the denim industry (sustainability focused).

This is an overview of all the stakeholders

Stakeholder	Priority	How many	Who	Done
(EU) politiek	Low/ Medium			
Governmental bodies	High	2 a 3		DONE
				To-do
				To-do
Cotton producer	Low, not necessary	-		-

Spinner/ shredder	Medium/ High	1		To-do
Denim mill	Medium	1		To-do
Production factory	Low, not necessary	1		planned
Branche organisations	High	1 a 2		To-do
				WIP
Denim brand	High	3		DONE
				planned
				planned
				planned
Retailer	High	1		DONE
Consumer	High	Enquete		WIP
Textile collecting company- municipality waste	Low, not necessary	-		-
Textile collecting company- Textielbakken	High	1		DONE
Textile collecting company- second hand stores	High	2		See above
				planned
Textile collecting company- home pick-up	Medium	1		
Textile collecting company- In store pick-up	High	1		planned
Textile sorter	High	2		DONE
				done
				planned
Recycling company- mechanical	Medium	1		To-do
Recycling company- -chemical	Medium	1		planned
NGO	Medium	1		DONE
Business/ ICT/ systems alignment	Medium	1		DONE
Certification companies	Low, not necessary	-		-
Knowledge institutions/ experts	Medium	1		planned
Other				-
Transportbedrijven	- perhaps for in a later stadium			Not now
Waste processing plant	Medium			-
		Total	16	

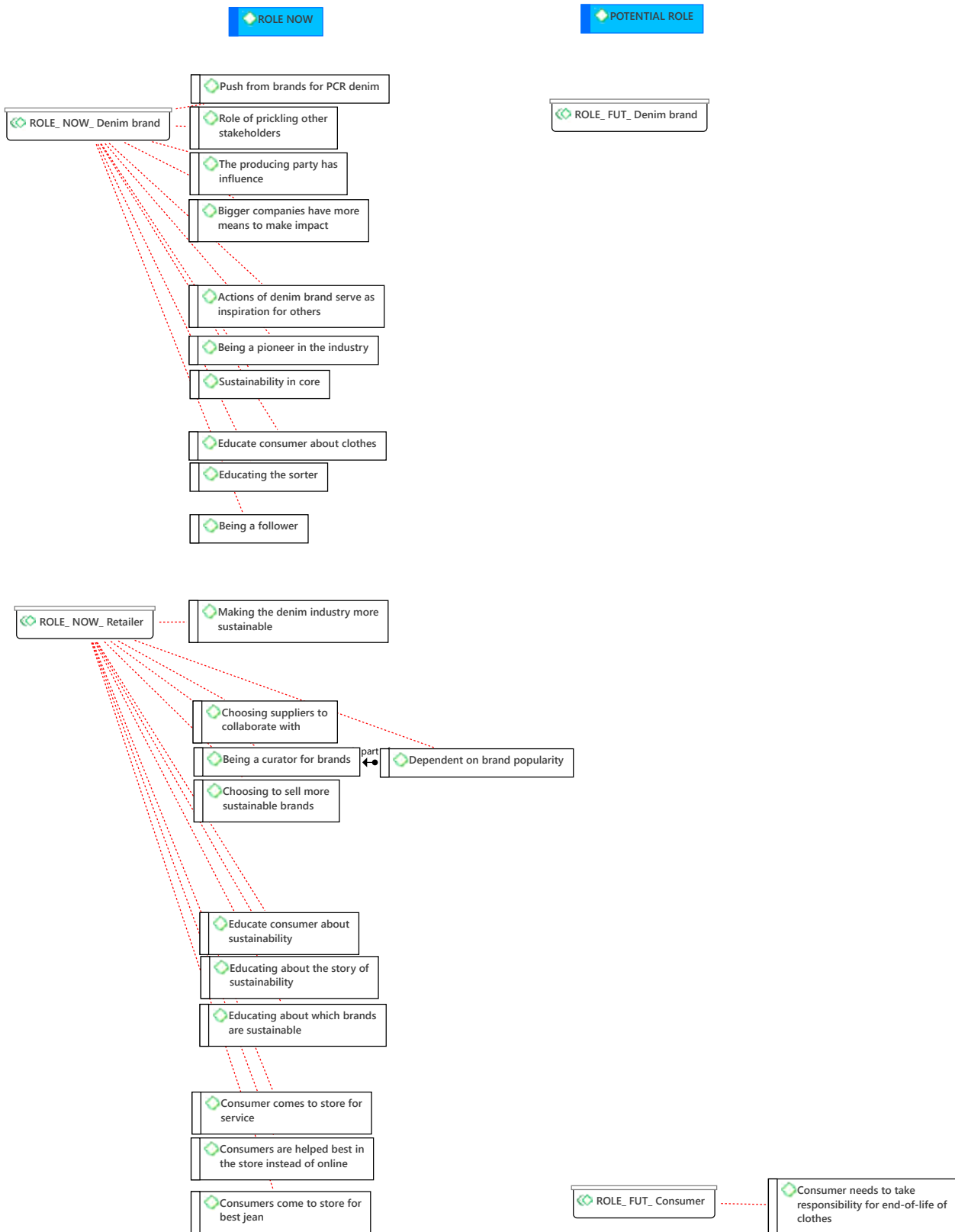
C: INTERVIEW EXAMPLE

[Tijd]	
[Adres]	
Aanwezig: Anne Jacobs	
[Interviewee]	
Intro	
5min 00:00 – 00:05	<p>Dankjulliewel voor jullie tijd. Ik heb ongeveer 60min ingepland voor dit gesprek. Ik zou het graag willen opnemen, zodat ik het voor mijn onderzoek kan gebruiken. Ik heb daarvoor een kleine papieren bevestiging nodig, zouden jullie dat willen tekenen?</p> <p>[Recorder aan]</p> <p>Ik zal eerst een korte toelichting geven over mijn project. Ik ben een MSc student aan de opleiding Strategic Design aan de TU Delft. Deze master is gefocust op de business context achter product- en service design en gaat over innovatie en strategie. De methode waar we mee werken is de design-thinking aanpak. Ik ben zelf geïnteresseerd in duurzaamheid en kleding, dit is ook een industrie die ik wil verkennen voor na mijn afstuderen.</p> <p>Dit interview is onderdeel van mijn afstudeerproject waarvoor ik een stukje onderzoek en een stukje ontwerp doe.</p> <p>Ik ben in samenwerking met House of Denim en Retail Experts/ Textiles 2 Textiles op zoek (RQ) naar het opzetten van een infrastructuur om (denim) kledingstukken terug de loop in te halen nadat ze gedragen zijn door de consument.</p> <p>(PS) Daar zijn natuurlijk al verschillende manieren voor, maar deze zijn niet allemaal even efficiënt en financieel voordelig. Er liggen ook plannen rondom een UPV (uitgebreide producenten verantwoordelijkheid), dus de situatie gaat waarschijnlijk sowieso veranderen.</p> <p>In dit gesprek wil ik het eerst kort hebben over Denim brand. Daarna wil ik kijken naar de huidige situatie, naar de pilot die jullie nu draaien waar James me over verteld heeft. Ik ben benieuwd waar jullie tegenaan lopen (obstakels) of welke kansen jullie juist zien. Daarna wil ik het graag hebben over of jullie eventueel al een ideale eindsituatie voor ogen hebben, hoe die eruit ziet, welke rol jullie daarin spelen en wat ervoor nodig is om daar te komen.</p> <p>Als je vragen voor mij hebt, stel ze gerust tussendoor, maar dan stel ik voor dat we nu gewoon beginnen.</p>
Elkaar leren kennen	
10min 00:05 – 00:15	<ol style="list-style-type: none"> 1. Wat is in het kort jullie rol bij Denim brand toelichten en jullie interesse in dit gesprek? 2. Wat betekent denim voor Denim brand? 3. Wat betekent sustainability voor Denim brand? <ol style="list-style-type: none"> a. Werken jullie al met PCR-denim? 4. Welke rol neemt Denim brand aan binnen de denim industrie?
Context van het probleem	
20min 00:15- 00:35	<ol style="list-style-type: none"> 5. Ik heb van [naam] begrepen dat jullie bezig zijn met een pilot voor het ophalen van gedragen denim. Kan een van jullie daarover uitweiden?

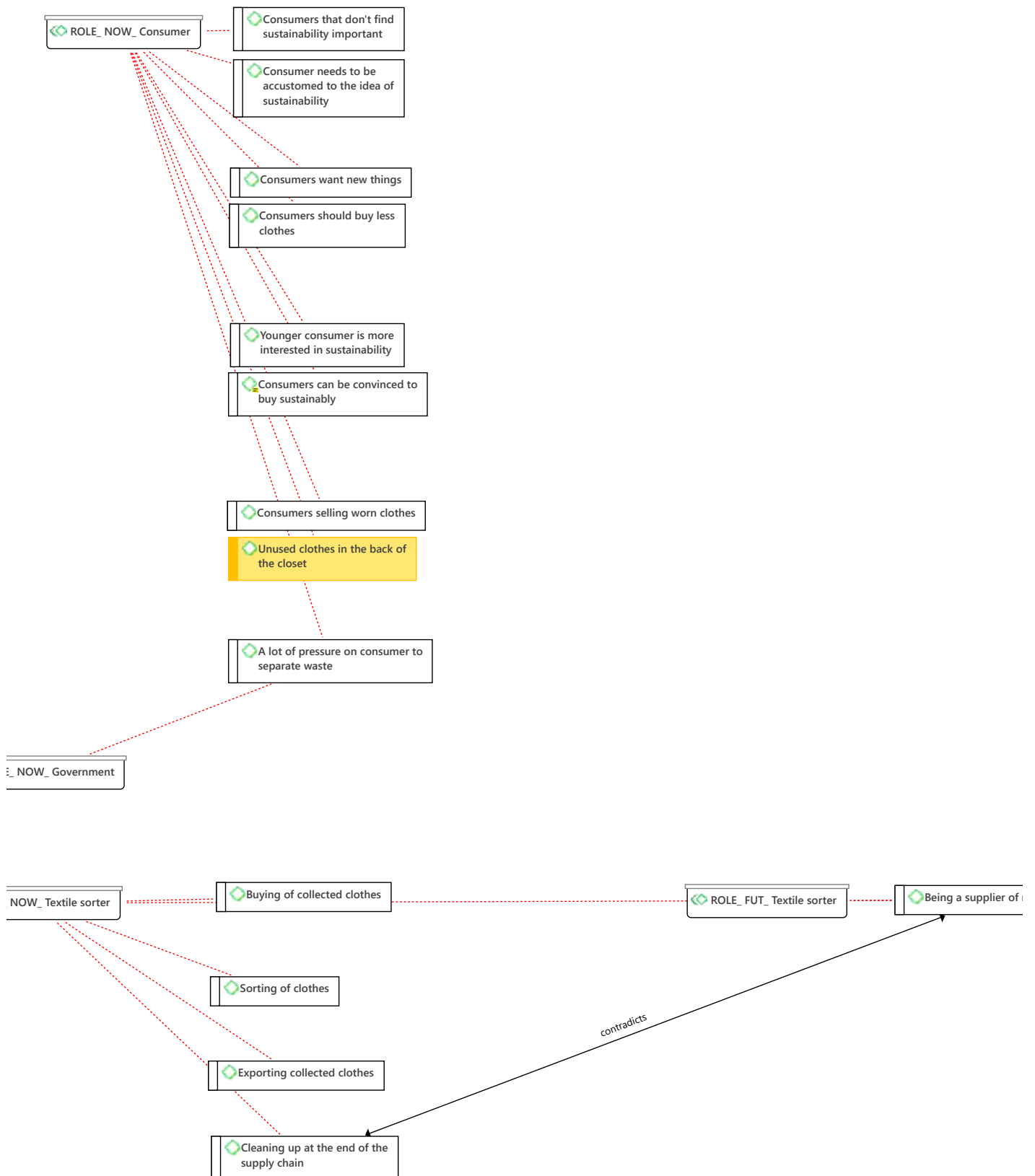
- a. Halen jullie alleen denim op of ook andere kledingstukken?
 - i. Waarom?
 - b. Hoe gaat het “**ophalen**” in zijn werk **praktisch** gezien?
 - i. Waar wordt de kleding heen gebracht?
 - c. Met wat voor partijen **werken jullie samen**?
 - d. **Sinds wanneer** zijn jullie gestart?
 - e. Hoe **motiveren** jullie klanten hun spijkerbroeken in te leveren?
 - i. Als met een financieel incentive: verwachten jullie dat dit op den duur ook geld oplevert of alleen geld kost?
 - f. Wat zijn de **resultaten** (tot nu toe)?
6. Wat was de **situatie voor/ zonder** deze pilot?
 7. Vanuit welke **vraag** zijn jullie deze pilot gestart?
 - a. Heeft het iets te maken met het **upv** (uitgebreide producentenverantwoordelijkheid)?
 8. Wat is jullie **motivatie** voor deze pilot?
 9. Wat is het **doel** of **ideale eindsituatie**?
 - a. Houdt het op bij het afleveren of willen jullie hier ook PCR-denim van ontwikkelen?
 - i. Zo ja, staan jullie ook open voor denim van andere merken, of moet het echt van Denim brand zijn?
 - ii. Waarom?
 10. Wat voor **verdienmodel** zit er achter de pilot (om de kosten te dekken)?
 - a. Winnen jullie die Xeuro korting voor de klant weer ergens terug?
 11. Wat zijn de **kansen** die jullie zien?
 12. Wat zijn de **obstakels** of **pijnpunten** waar jullie tegenaan lopen?
 - a. Wat zijn de **financiële** aspecten die hieraan zitten?
 - b. Wat zijn de **sociale** aspecten die hieraan zitten?
 - c. ~~Wat zijn de **demografische** aspecten die hieraan zitten?~~
 - d. Wat zijn de **technologische** aspecten die hieraan zitten?
 - e. ~~Wat zijn de **ecologische** aspecten die hieraan zitten?~~
 - f. Wat zijn de **politieke** aspecten die hieraan zitten?

	Ideale eindsituatie & how to get there
20min 00:35- 00:55	<p>13. Buiten deze pilot om en ook geen rekening houdend met wetgeving, wat zou jullie ideale eindsituatie zijn mbt end-of-life van gedragen denim?</p> <p>14. Wat zijn jullie eigen ambities hierin?</p> <p>15. Welke rol zouden jullie hierin willen aannemen?</p> <p>a. Is deze veranderd tov jullie rol nu?</p> <p>16. Welk obstakels houden jullie nu direct tegen om deze eindsituatie te bereiken?</p> <p>17. Welke kansen zien jullie?</p> <p>18. Wat hebben jullie nodig om deze rol te kunnen vervullen?</p> <p>a. Wat zouden potentiële financiële incentives kunnen zijn?</p> <p>b. sociale incentives?</p> <p>c. demografische incentives?</p> <p>d. technologische incentives?</p> <p>e. ecologische incentives?</p> <p>f. politieke incentives?</p> <p>19. Welke samenwerkingen zijn er nodig?</p> <p>a. Die er nu nog niet zijn?</p> <p>b. Die er nu wel zijn?</p> <p>c. Wie moet er innoveren om dit te bereiken?</p> <p>d. Wie moet meegaan in jullie innovatie?</p> <p>20. In ecosysteem innovaties is er vaak een leidende partij. Wie zou dat volgens jullie moeten zijn?</p> <p>a. Waarom?</p> <p>21. Wat voor verdienmodel zou hierachter kunnen zitten?</p>
	Outro
	<p>Heel erg bedankt voor jullie informatie. Ik ben van plan ook op een manier een soort experimenten aan te gaan zetten.</p> <p>X. Hebben jullie eventueel interesse hieraan mee te werken of dit te blijven volgen?</p> <p>X. Hebben jullie nog vragen voor mij?</p>

D: CODES FROM ATLAS.TI



The code groups and codes for the different roles of stakeholders in the ecosystem (now and future).

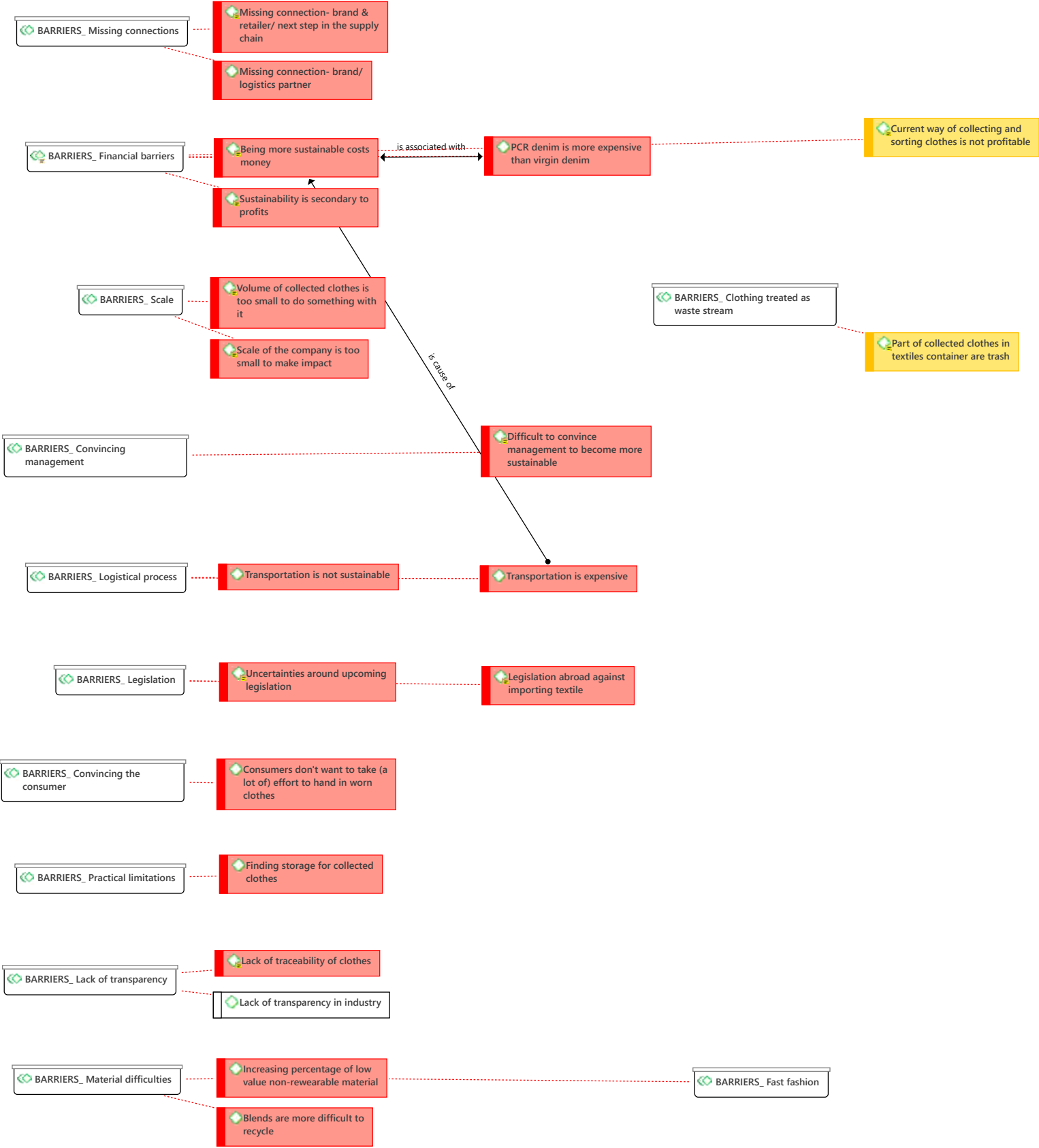


The code groups and codes for the different roles of stakeholders in the ecosystem (now and future).

BARRIERS TO RECYCLE/ COLLECT FOR BRANDS & RETAILERS

GENERAL BARRIERS TO RECYCLE/ COLLECT

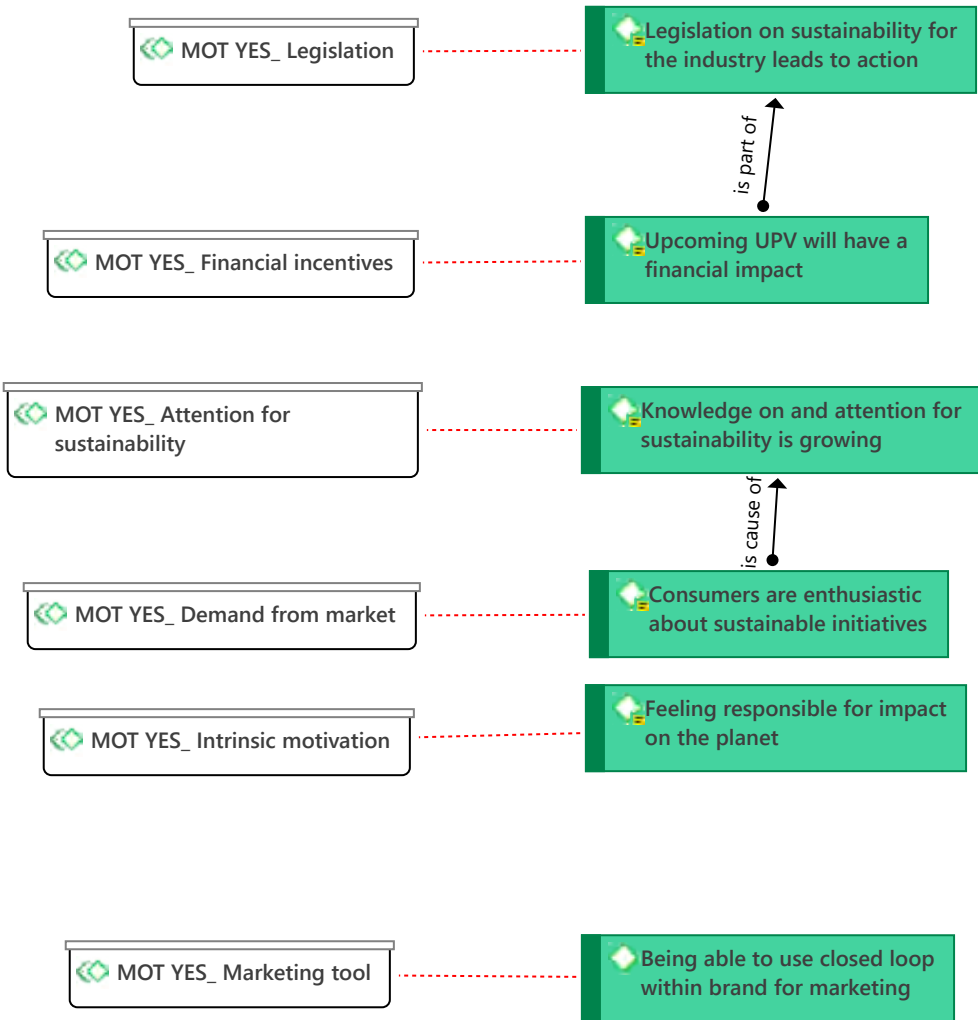
Insignificant



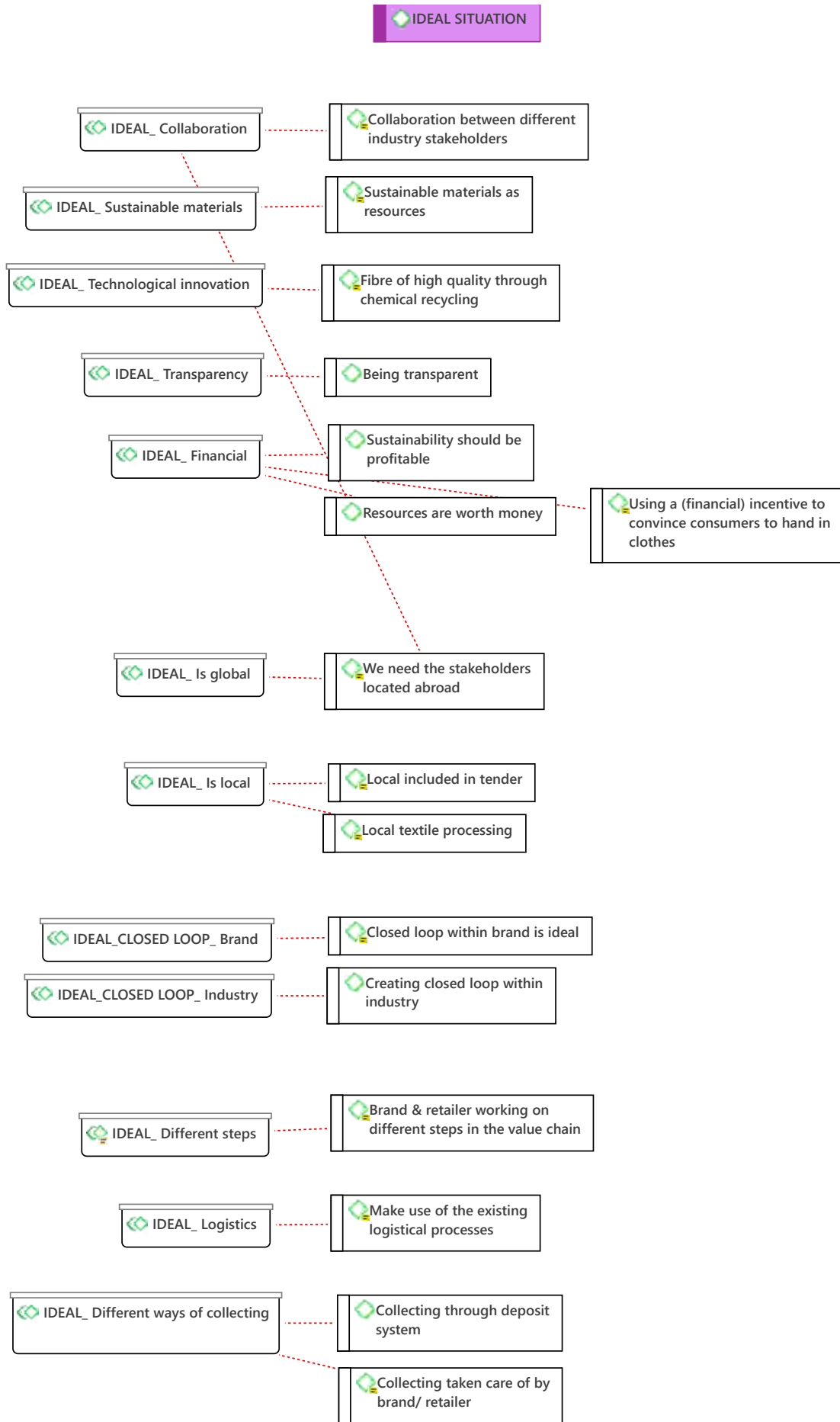
The code groups and codes for the barriers to collecting and working with post-consumer (recycled) textiles.

MOTIVATIONS TO RECYCLE/
COLLECT

Insignificant



The code groups and codes for the drivers to collecting and working with post-consumer (recycled) textiles.



The code groups and codes for the ideal situation for collecting and working with post-consumer (recycled) textiles.

E: QUESTIONNAIRE

What do you do with a clothing item you don't wear anymore?

Welcome! With this survey I want to learn more about what happens when you don't wear an item of clothing anymore. In the second part of the survey I want to learn more about how you feel about jeans in specific.

It will take around 10minutes to fill this in.

This survey is part of my graduation thesis for the MSc Strategic Design at the TU Delft. Your answers will be anonymous. If you want to learn more or find out about my research, contact me at annejacobs.design@gmail.com.

Thank you!
Anne

*Vereist



You and your clothes

First I would like to know more about you and your clothes in general.



1. What I find important when buying new clothes is that they are... *

Markeer slechts één ovaal per rij.

	1= not at all important	2= slightly important	3= moderately important	4= very important	5= extremely important
Fashionable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cheap	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sustainable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Practical	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Comfortable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Durable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Other aspects that I find important when buying new clothes is that they are...

If the previous question failed to mention aspects that you find important, please state them here.

3. How often do you buy new clothes? *

Markeer slechts één ovaal.

- Several times per week
- Several times per month
- Several times per six months
- Several times per year
- Less often

4. When I buy new clothes, I shop at... *

Online and/ or in a physical store.

Markeer slechts één ovaal per rij.

	1= never	2= rarely	3= sometimes	4= often	5= always
Big brand stores like Zara and H&M	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Luxury brand stores	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Smaller brands and boutique stores	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Second-hand stores	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Second-hand apps like Vinted	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Department stores	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. I also shop at...

If the previous question failed to mention types of places (both online and/ or in a physical store) for buying new clothes, please state them here.

End-of-life of clothes

I would like to ask some questions about how you dispose of your clothes after you don't wear them anymore.

6. My main reason for wanting to dispose of an item of clothing is... *

Select the options that correspond most with your reasons for disposing of an item of clothing (max 2).

Vink alle toepasselijke opties aan.

- Wear and tear (damage that comes from ordinary use) or other damage
- The item is out of fashion
- The item is not my taste anymore
- It doesn't fit me anymore

Anders: _____

7. What do you do with an item of clothing that is too damaged or worn out to wear? *

Markeer slechts één ovaal per rij.

	1= never	2= rarely	3= sometimes	4= often	5= always
I don't know what to do with the item	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I keep the item in my home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I give the item away to friends/ family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I donate the item in the textile containers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I donate the item to a charity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I resell the item	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I throw away the item in the trash bin	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I hand in the item in the brands' store	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. Another way in which I dispose of an item of clothing that is too damaged or worn out to wear is...

If the previous question failed to mention ways of disposing that you use for damaged clothing, please state them here.

9. What do you do with an item of clothing that is still wearable, but you want to dispose of for other reasons? *

Markeer slechts één ovaal per rij.

	1= never	2= rarely	3= sometimes	4= often	5= always
I don't know what to do with the item	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I keep the item in my home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I give the item away to friends/ family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I donate the item in the textile containers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I donate the item to a charity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I resell the item	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I throw away the item in the trash bin	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I hand in the item in the brands' store	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Another way in which I dispose of an item of clothing that is still wearable is...

If the previous question failed to mention ways of disposing that you use, please state them here.

11. What I find important when disposing of an item of clothing is that... *

Markeer slechts één ovaal per rij.

	1= not at all important	2= slightly important	3= moderately important	4= very important	5= extremely important
I earn some money for the item	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is easy to do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It happens in an environmental friendly way	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It makes me feel good	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do what is expected of me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It makes someone else happy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. Other aspects that I find important when disposing of an item of clothing is...

If the previous question failed to mention aspects that you find important, please state them here.

You and jeans

I'm interested to learn more about your opinion about jeans in particular!



13. I wear jeans... *

Markeer slechts één ovaal.

- 1= never
- 2= rarely
- 3= sometimes
- 4= often
- 5= always

14. I am currently the owner of ... pairs of jeans. *

Fill in a number for the amount of jeans you own, including the ones you don't wear anymore and that are laying in the back of your closet! (Jeans are trousers that are usually made of a blue, strong, twill cotton fabric: denim. Not all jeans have to be blue, they can also be dyed black or gray, for example.)



15. My main reason to wear jeans is because they are... *

Select the answer that corresponds most with your most important reason for wearing jeans (max 1).

Markeer slechts één ovaal.

- I don't wear jeans
- Fashionable
- Cheap
- Sustainable
- Practical
- Comfortable
- Durable
- Anders: _____

16. How do you feel about jeans?

Markeer slechts één ovaal.

- 1= I don't like jeans at all
- 2= I don't really like jeans
- 3= I am neutral about jeans
- 4= I like jeans
- 5= I really like jeans a lot

General info

I would like to know some practical info, it's only three questions!

17. I am currently living in The Netherlands *

Markeer slechts één ovaal.

- Yes
- No

18. What is your gender?

Markeer slechts één ovaal.

- Female
- Male
- Prefer not to say
- Anders: _____

19. My age is... *

Wait, I have something to say!

Would you like to make a comment? Please let me know!

20. Yes, I want to make a comment about the topic of clothing disposal or about jeans.

Thank
you
very
much!

Thank you for filling in the questionnaire, this helps me a lot in my research on the collection system of worn clothes. Your answers are anonymous. If you have any questions you can contact me at annejacobs.design@gmail.com. Don't forget to press send!

Deze content is niet gemaakt of goedgekeurd door Google.

Google Formulier

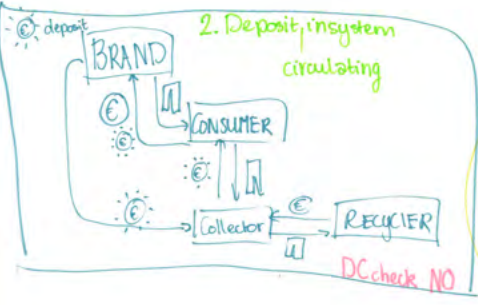
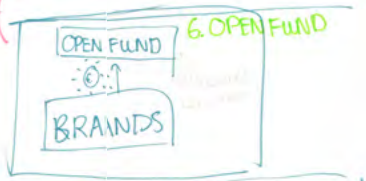
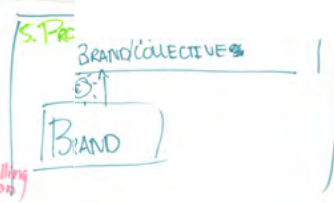
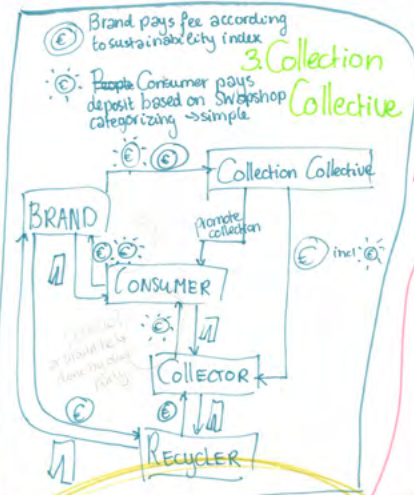
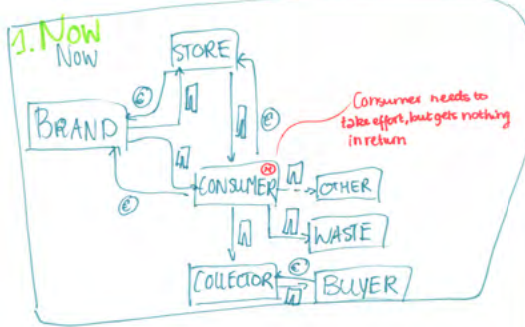
F: DRAWINGS IDEATION



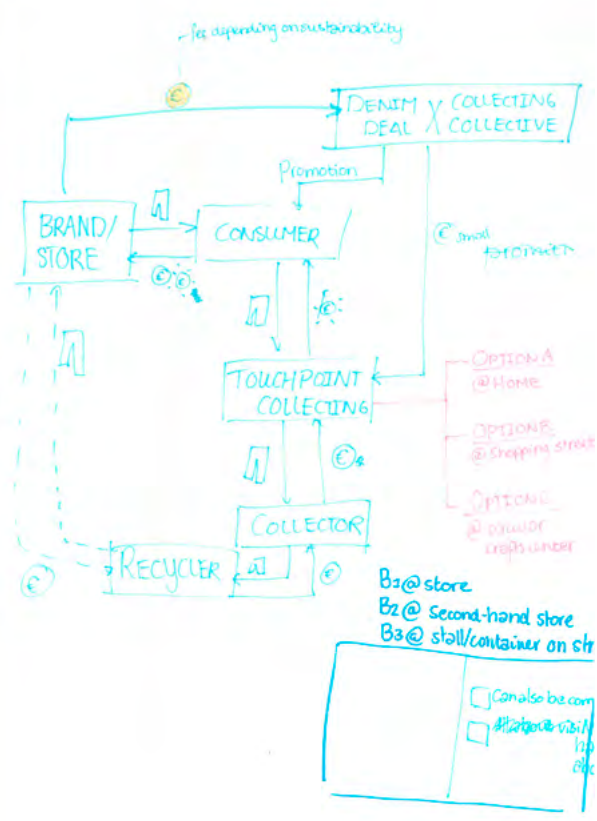
Drawings for “How might an overarching (EPR) organization look like & function?”

In 2023, how might the ecosystem shift?

Ecosystem



Drawings for "How might the relations in the ecosystem look like?"



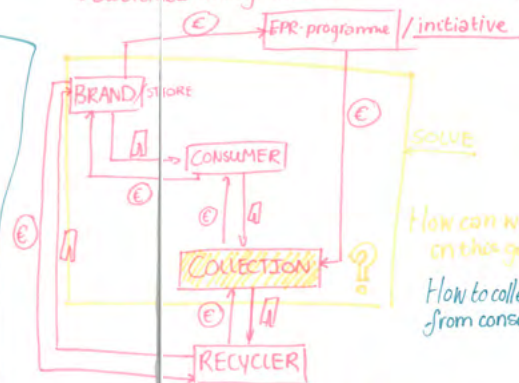
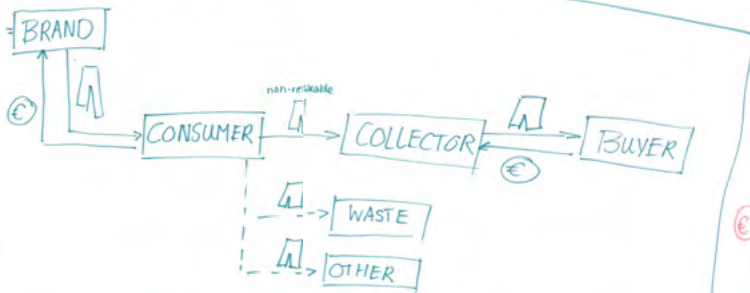


EPR

- * collection
- * transport
- * treatment
- * clean up filter
- * awareness raising measures

difference with deposit system for PET - bottles: clothes last longer, so you might forget you paid deposit

CURRENT EXCHANGE ANNO 2021



How can we fill on the gap?
How to collect denim garments from consumers?

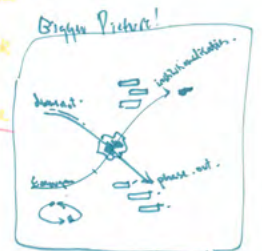
- How might we collect from the consumers?
- How might the ecosystem look like?
- How might the EPR-programme look like?



AVALEX J: CO

dark matter Labs

In der Johanna








Drawings for "How might the relations in the ecosystem look like?"










Drawings for "How might the touchpoint between consumer and collector look like?"


G: DATUM METHOD

						
	1. Textiles container above ground	2. Curbside pickup	3. Home pickup	4. Collect in-store	5. Textiles container underground	
Consumer	Ease of use for consumer	X	+	+	-	S
	Opportunity to make consumer aware	X	S	+	+	-
	Opportunity to provide consumer with incentive	X	S	+	+	-
Producer	Producer has responsibility	X	S	S	+	S
	Makes producer aware	X	S	S	+	-
Other	Cost	X	-	-	-	S
	Effort	X	-	-	-	S
	Quality of material	X	-	+	+	-
	Scalability	X	-	-	S	S
	Ease in logistics	X	-	-	S	S
	Future proof	X	-	S	S	S
	$\Sigma +$	X	1	4	5	0
ΣS	X	4	3	3	7	
$\Sigma -$	X	6	4	3	4	
Total	X	-5	0	2	-4	
Notes		Is probably not allowed, since "waste" is often not allowed on the streets.	There is a pilot in Amsterdam, De Textielrace, which is testing this now.			

Different ideas for the collection touchpoint rated compared to the current method of textiles containers above ground.

 6. Send via mail	 7. Charity hand-in	 8. Collection ambassadors	 9. Bottle/ clothes collection at supermarket	 10. Voddenman	 11. Milieustraat/ Circular crafts center	 12. Stand on the shopping street
-	-	-	+	+	-	-
+	+	+	S	+	+	+
+	+	+	+	+	+	+
+	S	+	S	S	S	+
S	S	+	S	S	S	+
-	-	-	-	-	-	-
-	-	-	-	-	-	-
+	+	+	+	+	S	+
+	S	S	+	-	S	S
-	+	-	+	-	+	S
+	S	-	S	-	+	S
6	4	5	5	4	5	5
1	4	5	4	3	4	2
4	3	4	2	5	3	3
2	1	0	3	-1	2	2
	This doesn't make sense to test in a pilot, since this method is already used.	Interesting as part of awareness campaign, not separately.	This proposition is currently being offered by Drop&Loop.			



H: DETAILED CONCEPTS




TOUCHPOINT A- COLLECTION AT HOME

Consumers place their textiles in a waterproof bag that they can place on the street for the garbage men (can be a separate organization) to collect. Collection happens in regular intervals. An alternative is that garbage men knock on the door to collect the bags.

HOME PICK-UP OF TEXTILES AS PART OF MUNICIPALITY WASTE CALENDAR

-  Can be an addition to the waste collection programme of the municipality (but organised by a different partner)
-  Pick-up of of textiles happens on regular intervals which are shown on the municipality waste calendar
-  Residents receive information in advance & a special (reusable) bag for the textiles

 - More difficult to give residents financial compensation for the textiles
- Indirect link with textiles producers

 + easy for consumers

Effort consumer 000 **Effort industry stakeholders** 000 **Involvement producers** 000 **Cost** 000

Graduation project - Anne Jacobs - 2021



TOUCHPOINT A- COLLECTION AT HOME

RECEIVE PACKAGE/ SEND PACKAGE

Graduation project - Anne Jacobs - 2021

Touchpoint of collection at home, consisting of home pick-up and receive/ send package developed with more detail.

TOUCHPOINT B- COLLECTION AT SHOPPING DISTRICT



Option B1- hand in clothes in selected stores in city centre

Option B2- hand in clothes at pop-up stand every "koopavond" (can also be a textiles container)

Option B3- hand in clothes in selected second-hand stores in city centre

Winner

HANDING IN CLOTHES AS PART OF YOUR SHOPPING TRIP



Combinations between the options might be made



Not all the stores have to collect, it's all about creating a good spread and visibility



- Retailers have extra responsibilities
- Corona restrictions might be a limiting factor, especially for a pilot in early 2022



+ A lot of opportunity to educate the consumer
+ Direct link with producers and shopping behaviour
+ Make use of existing logistics streams

Effort consumer
000

Effort industry stakeholders
000

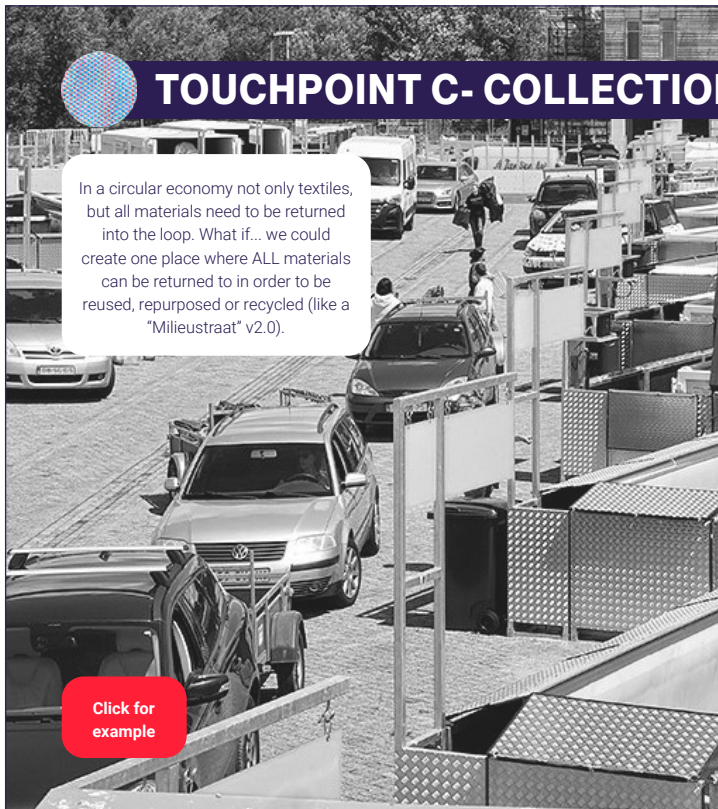
Involvement producers
000

Cost
000

Graduation project - Anne Jacobs - 2021

Touchpoint of collection in the shopping street developed with more detail.

TOUCHPOINT C- COLLECTION AT CIRCULAR CRAFTS CENTRE



In a circular economy not only textiles, but all materials need to be returned into the loop. What if... we could create one place where ALL materials can be returned in order to be reused, repurposed or recycled (like a "Milleustraat" v2.0).

Click for example

WHAT IF... ALL MATERIALS NEED TO BE RETURNED? NOT JUST TEXTILES



In close collaboration with existing textile sorters & second-hand stores



This is maybe more of a long-term vision and might be outside of a pilot-scope



- Requires a lot of effort



+ Will have a very high impact if done well, not just for the textiles industry
+ Creates a lot of job opportunity

Effort consumer
000

Effort industry stakeholders
000

Involvement producers
000

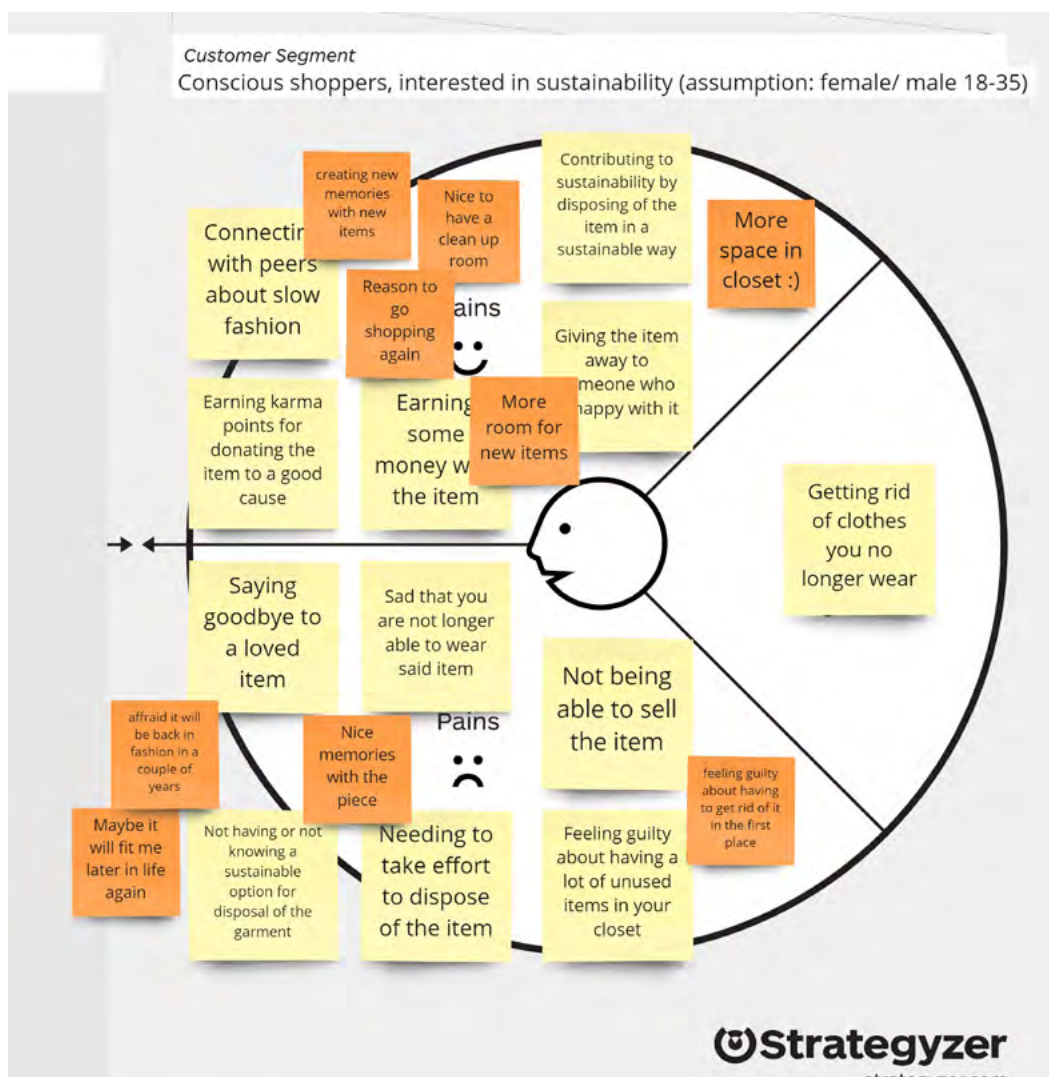
Cost
000

Graduation project - Anne Jacobs - 2021

Touchpoint of collection at circular crafts center developed with more detail.

I: CREATIVE SESSION

Bring an item that has been lying in the back of your closet forever and of which you don't really know what to do with it.



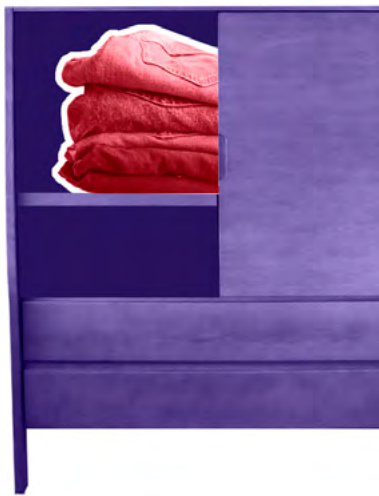
Screenshots from the creative session on denim collection.



A screenshots from the creative session on denim collection.

J: STORYTELLING

I want you to think about that pile of clothes that has been laying in the back of your closet now for some time... Too dear to just throw away, but not nice enough to wear again.



I have a pile of jeans which makes me feel quite guilty. You wouldn't believe it... One day it even started growling at me!

When you think about it though, it is quite understandable...



Jeans are meant to be worn! If they are not worn they get touch deprived. All this bottled up sadness leads to anger.



The little monster actually just wants to be loved.



Now imagine that every household has one or two of those piles of unworn jeans. Altogether that adds up!



All those sad little piles combined make up for a huge monster that needs saving!

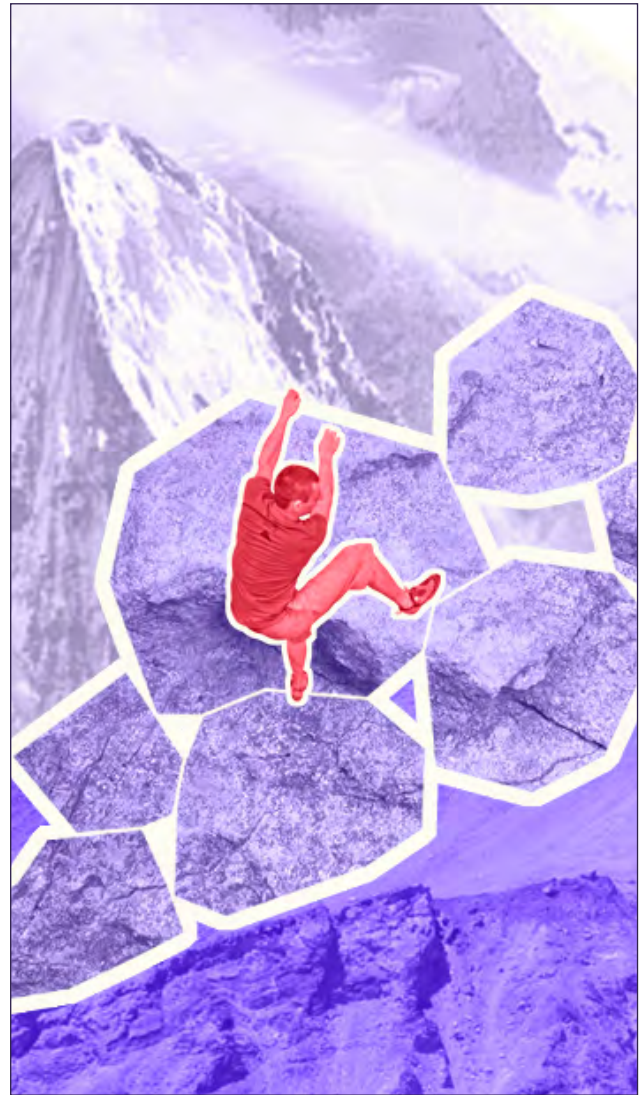


Luckily, there are a lot of people working on saving these little monsters.

The first step is collecting them!



But their quest to save the monster can sometimes feel like climbing a mountain.



They encounter barriers they need to overcome.



Luckily they have a backpack filled with energy bars, driving them up the



But everyone knows, mountaineering is easier once someone has done it before and has set out ropes to guide you.

SHOW CASE

We aim to set out the ropes with the case study of De Rode Winkel X Textiles2Textiles where jeans were collected in-store & then processed.

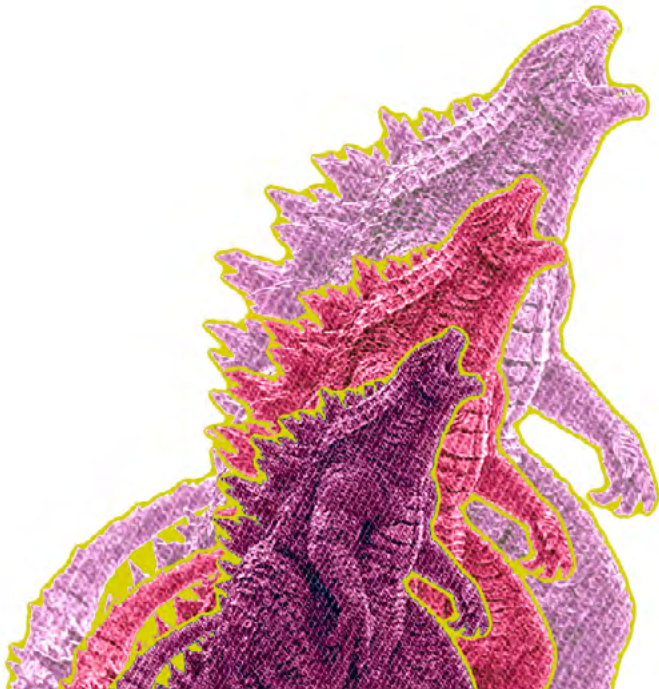
Ultimately the plan is to ditch the ropes and to build a way of reaching the jeans-monster that is accessible to everyone!





COLLECTION AS A SERVICE

To make collecting and processing worn clothes accessible to everyone, we propose collection as a service, a proposition offered by a collective of textiles collectors, sorters & transporters.



So the brands and the retailers can easily reach the monster and give it a new purpose in life...



Either by reusing, repurposing or recycling parts of the monster!

*And finally
the little jeans
monsters can be
happy again!*



K: WEBSITE CASE STUDY

Home Merken Tips & Trends Duurzaam Heren Jeans Dames Jeans Herenmode Dames Mode Accessoires Klantenservice

LEVER UW OUDE JEANS BIJ ONS IN

+ Wat doe je met de jeans dit je niet draagt?

+ Wat gebeurt er met mijn oude jeans?

- Waar kan ik mijn oude jeans inleveren?

Er zijn verschillende inzamelpunten voor je oude jeans. Bij sommige supermarkten of op straat staan bijvoorbeeld verzamelcontainers voor oude kleding een textiel. Ook bij een kringloopwinkel, liefdadigheidsinstelling of soms bij een kledingwinkel kan je oude jeans inleveren. Daarnaast kan je ze wegbrengen bij het gemeentelijk afvalstation.

Gooi je jeans in ieder geval niet in de prullenbak!

Check waar het dichtstbijzijnde inzamelpunt voor jou zit.

Een oude jeans kan je ook inleveren bij De Rode Winkel in de winkel.

*
Voornaam Achternaam

*
Voornaam Achternaam

*

*

Postcode Stad

Land

Verzend

Part of the website that was used in the case study to convince people to hand in jeans.

L: RESULTS CONSUMER CAMPAIGN

	Mailing						
Incentive	Recipients	People opened	Open ratio (wrt recipients)	People clicked	Click ratio (wrt opens)	# clicks	Click ratio (wrt recipients)
1. Address feelings of guilt about unworn jeans	3052	1347	44,2%	24	1,8%	55	1,8%
2. Inform about where you can hand in old jeans	3052	1470	48,2%	16	1,1%	42	1,4%
3. Give a financial incentive to hand in jeans	3052	1446	47,4%	15	1,0%	35	1,1%
4. Inform about what happens with collected jeans	3052	1494	49,0%	18	1,2%	20	0,7%

	Facebook						
Incentive	Reach	Engagement	Engagement (%)	Link clicks	Click ratio (wrt reach)	# Visitors landing page	Weighted average
1. Address feelings of guilt about unworn jeans	8540	82	1,0%	81	0,9%	32	1,5%
2. Inform about where you can hand in old jeans	5655	25	0,4%	24	0,4%	10	1,0%
3. Give a financial incentive to hand in jeans	6326	39	0,6%	37	0,6%	15	0,9%
4. Inform about what happens with collected jeans	5777	42	0,7%	41	0,7%	13	0,7%

The data in black are the numbers I received from De Rode Winkel

The data in gray are the numbers I calculated using the data from De Rode Winkel

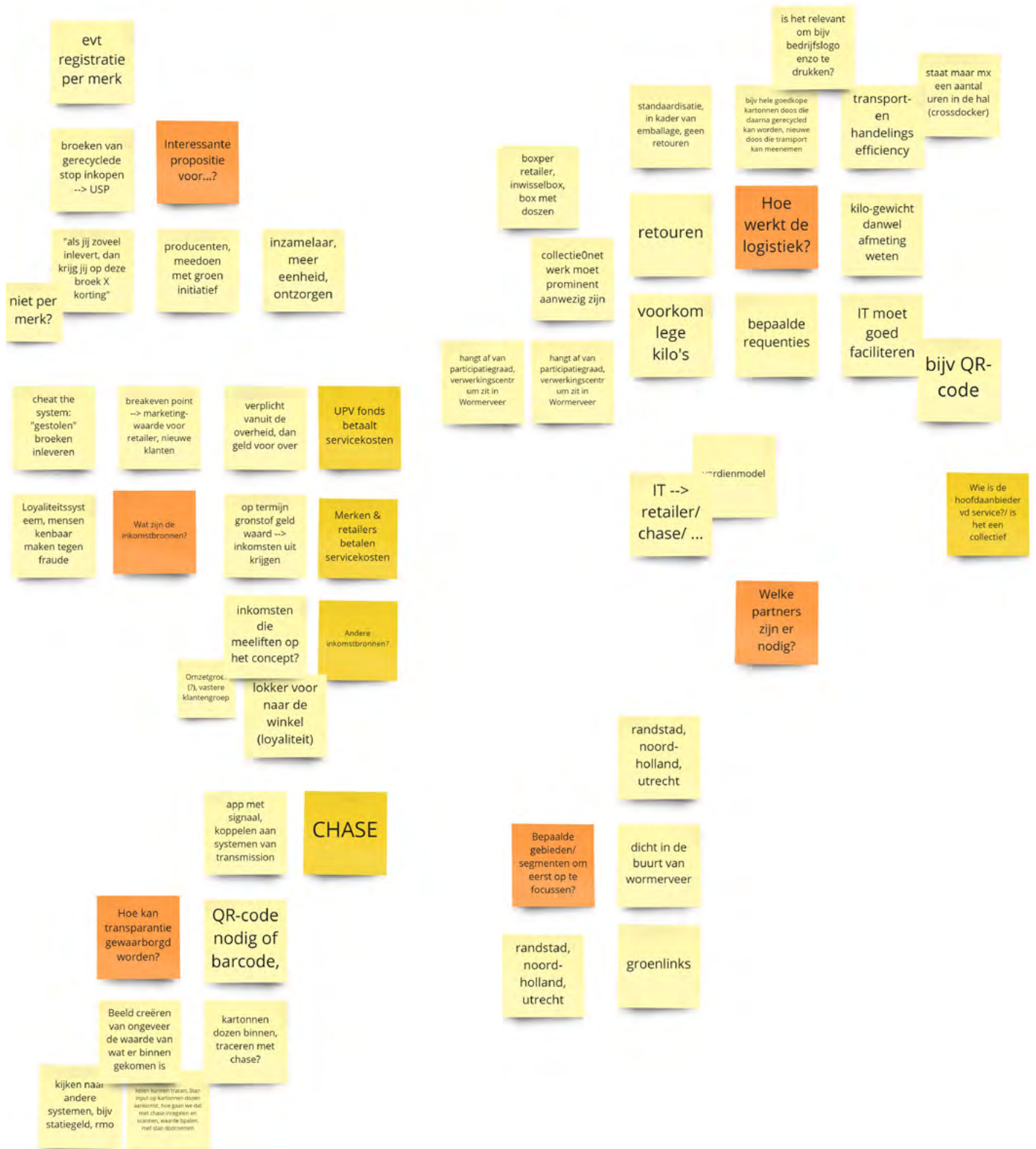
Formula for the weighted average: (3 Click ratio wrt recipients- mailing + 2 * Click ratio wrt reach-Facebook)/5*

The mailing was given more weight, because it was better targeted towards consumers with interest in denim

Results from the mailing- and social media campaign by De Rode Winkel.

M: DISCUSSION SESSION 1

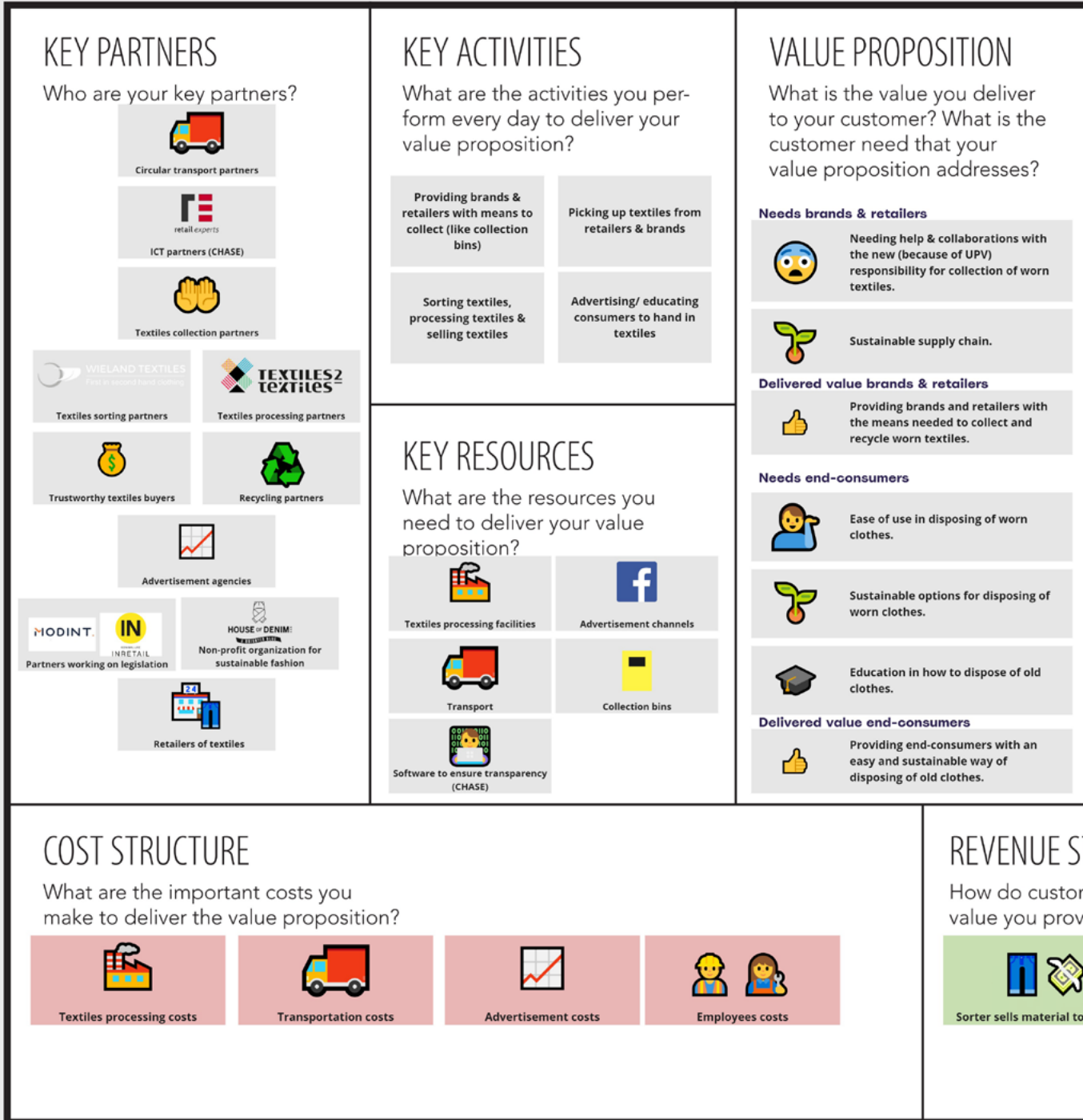
(Hoe) kunnen we COLLECTION as a SERVICE aanbieden?



Screenshot from the brainstorm session from discussion session #1.

N: BUSINESS MODEL CAAS

BUSINESS MODEL CANVAS



Business model for collection as a service.

CUSTOMER RELATIONSHIPS

What relationship does each customer segment expect you to establish and maintain?



Transparent communication for every step in the chain



End-consumer: Discount system (?)



Brands & retailers: Discount system if more sustainable

CHANNELS

How do your customer segments want to be reached?



End-consumers: social media & website



Brands & retailers: account manager

CUSTOMER SEGMENTS

Who are your customers?



Retailers of textiles



Textiles brands



End consumers

STREAMS

How do your customer segments reward you for the value you provide to them?

Buyers



Brands & retailers pay connection fee & fee/kilo

OR



UPV fund pays collection fee

O: ADVANTAGES COLLECTING COLLECTIVE

Pain points for brands and retailers	Advantages of The Collecting Collective for brands and retailers
B2. The scale of company is too small to make an impact & B3. Collected volume is too small to make an impact	<p>The Collecting Collective offers a service, so companies with limited resources do not have to set up their own infrastructure.</p>
B7. Sustainability is secondary to profits & B8. Sustainability costs money	<p>The service costs money, but brands and retailers receive indirect value through customer loyalty and attracting new customers.</p>
B9. Lack of traceability of garments & B10. Lack of transparency in the industry	<p>CHASE can add a traceability and transparency layer to the service in a later stadium.</p>
B11. The consumer does not want to make an effort to hand in clothes	<p>The consumer is incentivized with a 10% discount and motivated by a marketing campaign.</p>
B12. Uncertainties around EPR	<p>The service prepares brands and retailers for the EPR and allows them to be pioneers.</p>
B14. Difficult to convince management	<p>The service aims to give a clear overview of the costs and benefits of the service.</p>
B15-16. Missing connection with next step in supply chain & logistics partner	<p>The service provides these connections.</p>
B17-18. Transportation is expensive & unsustainable	<p>The service has partnered up with a logistics company to overcome these barriers in the future.</p>
B19. Needing to find storage for collected clothes	<p>The service makes sure the clothes are picked up when a certain volume is reached.</p>
	<p>The service enables brands and retailers to collaborate on creating a closed-loop, thereby creating a greener image for the brand and retailer.</p>

The Collecting Collective solves the barriers that were mentioned in the research-phase by brands and retailers.

P: ASSUMPTIONS

!!!! Riskiest assumptions, validate first

!!! Risky assumptions, validate second

- !!!! The sales price of denim excl right to resell is € 1,31/ kilo and €0,35/ kilo incl. Right to resell (reference: batch De Rode Winkel)

Cost breakdown:

- A reswappable box costs €2,50 (Reference: <https://app.packhelp.com/nl-nl/box/design?sku=box-nl--shipping-box--150--cardboard-natural--print-monochrome--foil-none&quantity=2500&dielineMode=false>)
- One reswappable box will hold 40kg.
- We will do a swap per 80kg (2 boxes of 40 kg).
- !!!! The transport costs are €20,-/ swap but will go down to €8,-/ swap once we reach a volume of 500.000kg. (Reference: logistics company indicated that transport for 2 boxes of 40kg costs €18,50 + some additional costs for making the swap)
- We will do a trip from the city hub to the sorting facility once we have a volume of 4.000kg at the city hub. This will cost €450,- per trip. (Reference: logistics company)

- !!! For the cost breakdown we make assumptions about the composition of the volume (Reference: client supervisor). --> this influences the sales price (see Confidential Appendix C)
- For the cost breakdown we make assumptions about the cost/ kilo for each step in the sorting process (Reference: client supervisor). (see Confidential Appendix C)

Income statement:

- We assume brands & retailers will want to pay a connection fee of €400,-/ store location.
- We assume brands & retailers will want to pay a kilo price of €0,19 per collected kilo of denim.
- !!! We assume a store location will collect 1.500kg in year 1, 3.000kg in year 2 and 3.500kg in year 3. (Reference: start-up 1.500kg/ store/ year; H&M 5.700kg/ store/ year; Rode Winkel 453kg/ store/ year)
- !!! We assume that on average in year 1 we will have 35 store locations, in year 2 60 and 145 in year 3. (Reference: Scotch & Soda has 32 store locations in the Netherlands)

Q: CONSUMER VALIDATION

Step 1: Write your name

[Name]



Step 2: Choose an item of clothing that you recently disposed of



Step 3: Discuss the steps you took to dispose of the item

Step 4: Give a color to the bubble which you think applied to this way of disposing.

This didn't take me effort

1 2 3 4 5

This earned me money

1 2 3 4 5

This is required of me

1 2 3 4 5

This made someone happy

1 2 3 4 5

This was environmentally friendly

1 2 3 4 5

This made me feel good

1 2 3 4 5

Step 5: Which attributes matter most to you when disposing of a garment? Rank your top 3.

This is required of me

This earned me money

This made me feel good

1

This was environmentally friendly

2

This made someone happy

3

This didn't take me effort

The concept was validated online with 5 interviewees. These are the answers of one of the respondents.

Step 6: Look at this flyer

COLLECTING COLLECTIVE | Collection as a service
Give worn denim a new life!



Hand in your old jeans at the denim store and receive **10% discount!**

Don't know what to do with that pile of clothes at the back of your wardrobe? Hand them in at the jeans store and we will give them a new life!



Find a connected store and hand in your jeans



You receive a 10% discount



We will sort them and find the right destination



You might even find your jeans back in the store, recycled or repaired

Step 7: For your top three of attributes, rate this way of handing in your jeans

Step 8: Discuss: would you hand in your jeans at a store?

This was environmentally friendly

1 2 3 4 5

This made someone happy

1 2 3 4 5

This didn't take me effort

1 2 3 4 5

CONSUMER VALIDATION

1= do not agree; 3= neutral; 5= do agree

Interviewee #1 (female, 26 years old)

- Cleans out closet once every year to fill a garbage bag with clothes
- Feels guilty about disposing of clothes
- Uses textiles container

Ranking	Attribute	Textiles container	The Collecting Collective
1	This made someone happy	4	4
2	This was environmentally friendly	3	4
3	This didn't take me effort	4	3,5

- Comments on concept
 - o Difficult that you can only hand in jeans
-

Interviewee #2 (female, 25 years old)

- I often clean out my closet and then I have a whole bag of old clothes that I need to do something with
- I bring it to my mom, she either gives it to a friend or brings it to a textiles container
- With a textiles container I am not really away of what they are doing with the items

Ranking	Attribute	Giving clothes to my mom's friend	The Collecting Collective
1	This was environmentally friendly	4	5
2	This made someone happy	5	4
3	This didn't take me effort	4	4

- Comments on concept
 - o I don't like the discount, as I try not to make any impulse purchases. But maybe it will convince other people
 - o From the collection bin at the H&M I liked that you could hand in everything, also curtains
 - o If there is also a repair service, it would be more environmentally friendly
-

Interviewee #3 (female, 24 years old)

- I cleaned out my wardrobe last week. I had one bag of clothes that is too old to rewear. We used an initiative for door-to-door pickup. I had one bag of clothes for the second-hand store and one bag of clothes for selling.
- It took a lot of effort to prep the clothes meant for selling. We had to make a selection, take pictures and now I haven't even put them online.
- I am not really aware of what happens with the items, I am not feeling in control.

Ranking	Attribute	Sell on vinted	Bring to second-hand store	Door-to-door collection	The Collecting Collective
1	This was environmentally friendly	5	4	3	5
2	This made someone happy	4	4	2	4
3					

- Comments on concept:
 - o I would forget to use the discount.
 - o I would trust a store a bit more that the clothes end up somewhere good.
 - o Nice that there is more insight or control about where the garments end up

Interviewee #4 (female, 22 years old)

- Give clothes away to my family
- I don't like donating clothes, since you don't really receive anything in return
- I pick out clothes regularly, each time I dispose of 5-7 garments

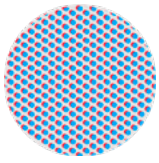
Ranking	Attribute	Giving clothes to my family	The Collecting Collective
1	This made me feel good	4	3
2	This made someone happy	4	2
3	This earned me money	1	1

Interviewee #5 (female, 17 years old)

- I don't buy a lot, so I also don't give away a lot
- I give clothes to my mom, I don't know what she does with them

Ranking	Attribute	Giving clothes to my family	The Collecting Collective
1	This didn't take me effort	5	3
2	This was environmentally friendly	4	4
3	This made me feel good	3	3

- Comments on concept:
 - o Doubt whether a discount is the right incentive
 - o Will people not just hand in all their old jeans?



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Master thesis

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Date of graduation

February 24th 2022

Graduation committee

*Chair: Prof. dr. Erik Jan Hultink
Mentor: Dr. Rebecca Price
Client supervisor House of Denim: James Veenhoff
Client supervisor Retail Experts: Peter Rijken*

