

Communicating circular messages to fashion consumers

Master's thesis in Industrial Design Engineering

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CHALMERS UNIVERSITY OF TECHNOLOGY Gothenburg, Sweden 2021 www.chalmers.se

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Department of Industrial and Materials Science Division Design & Human Factors Chalmers University of Technology, 2021

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Chalmers digital printing Göteborg, Sweden 2021

Cover: Garment Use Cycle, illustration by Hanna Edvardsson

Acknowledgement

This Master's thesis was performed in collaboration between Chalmers University of Technology and We aRe Spindye. It was performed by one student as the final work of a twoyear master's programme within Industrial Design Engineering at the department of Industrial and Materials science at Chalmers University of Technology during 2021.

I would like to thank We aRe Spindye for taking on the project and opening themselves up for collaboration with a for them entirely new competence, and engaging themselves in finding a project where their business and the industrial design engineering competence intersect. Special thanks to Beatrice Fernqvist, for providing invaluable intel on circular fashion, but also invaluable enthusiasm for the project, as well as her contagious passion for sustainability.

I would also like to thank Helena Strömberg who supervised and examined the project, for the time and faith she invested in the project. She teaches design by encouraging to explore freely, and supports when it inevitably gets tricky; both of which is exactly what you need to stay passionate about a challenging design project.

Thank you!

Hanna Edvardsson

Abstract

We aRe Spindye is a company that supplies textiles to fashion brands, with the goal of making the fashion industry circular by providing sustainable textile innovation. As of recently, We aRe Spindye offers textiles to their clients made from *chemically recycled polyester* which is considered a breakthrough in the pursuit of closing the material loops in the fashion industry. Upscaling the production of chemically recycled polyester is the next step of closing the loop, which requires an increased market demand, which depends on consumers to purchase garments made from chemically recycled polyester, which is why We aRe Spindye wants to communicate the breakthrough to the end consumer. A design project was carried out to design this communication, with the aim of exploring what drivers and barriers impact the communication, how that affects the specific message of chemically recycled polyester, and how user-centered design can contribute to communication in a way that fuels circular values and practices in the end consumer.

The design project builds on three studies: the message to be communicated, the end consumer perspective of the issue, and the business perspective of the issue, followed by problem reframing and concept generation. The result includes a written analysis of the three different perspectives, subsequent design guidelines for a communication concept, and a final design concept. It was found that drivers for communication include information that is affirmative of the consumer's driving forces and needs, good user experience, specific instruction and concrete knowledge. Barriers for communication include ambiguous information, overwhelming amounts of information and distrust in brands. Furthermore, it was found that communication needs to take a mixture of informative and enabling approaches in order for the consumer to be motivated enough to be impacted by the message. It was also found that the message has the best potential to sink in if looked at from several viewpoints, which resulted in the final design of 12 part concepts conveying different messages with different strategies to impact the end consumer.

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Chapter 1: Introduction

Background

Textile production has tremendous environmental impact in terms of resource depletion, water use, chemical pollution, and CO2 footprint (To et al, 2019). According to the Global Fashion Agenda, the Paris Agreement objective to keep global warming under 2.0 degrees celsius will not be met unless radical change is undertaken by the fashion industry (Global Fashion Agenda, 2019). While the ever-increasing rate of fashion consumption of the western world sets the demand for textile production, it takes its hardest toll on developing countries, where the textiles are largely produced and processed. This leads to water shortage and health hazards among the population in these areas, and last but not least social injustice, since many of the manufacturers do not give their workers fair and equal wages. Workers of the industry do not all get a minimum wage, with women being the least likely, making textile production a contributor to both poverty and gender inequality (Global Fashion Agenda, 2019). The fashion industry needs radical change in order to become sustainable.

The Global Fashion Agenda has set up eight different priorities for action, of which four are core priorities for immediate implementation, and four are transformational priorities for fundamental change (Global Fashion Agenda, 2019). Of the latter four, one is striving towards a circular fashion system, or circular economy, which for fashion means keeping products and materials in use instead of throwing them out to end up on a landfill. This is one of the eight action steps that fashion brands can take in order to work towards sustainable fashion.

We aRe Spindye

We aRe Spindye is a company that supplies synthetic textiles and yarns to fashion brands, who in turn produce garments and other textile products from the We aRe Spindye textiles. They specialize in environmentally friendly coloring of synthetic textiles, through a coloring technique that reduces water consumption by 75%, chemical consumption by 90%, energy consumption by 30-40% and CO2 imprint by 30%. Their goal is to help the fashion industry to become fully circular by providing sustainable textile innovation.

Launching chemically recycled polyester

An integral part of the sustainability of their products is the fact that We aRe Spindye only uses recycled materials in their yarns and textiles. Historically, their raw material has been mechanically recycled PET bottles. Since recently, they are also offering their clients textiles made of chemically recycled polyester, or textile post consumer waste. This is groundbreaking advancement for the circular economy because it sources its raw material from within its own industry, which creates a more closed-loop system. Naturally, this is something that We aRe Spindye wants to communicate to the world.

Communicating the breakthrough and a value

There are several reasons for We aRe Spindye to want to communicate this progress to the world. One reason is that the consumer possesses crucial power to close the loop of the fashion industry by choosing to return their products back into the loop post use. In order to fulfil their role, they need to be aware that they have this power. Furthermore, they can help the circular economy grow through creating a market demand by their purchase choices,

which can be assumed to be more likely to be in favor of the circular economy if they know about the material and its advantages for the circular economy. Another reason to communicate it is to explain to the consumers why garments made of this material end up being slightly more expensive than its alternatives.

Another motive is We aRe Spindye's explicit wish to spread the constructive value behind circular economy, which is that materials are a precious resource that can and should be used again, even if they are worn, or "recognising the socio-materiality of waste as a valuable resource instead of a valueless residue" (Keßler et al, 2021); in contrast to the destructive value behind the linear economy, which is that products are ours to wear and tear and then trash. The use of closed-loop materials is thoroughly driven by the constructive value, and therefore selling such products and communicating their benefits to the consumers is a way of spreading this value.

Obstacles

However, communicating to the end consumer what We aRe Spindye is up to is a complicated endeavor. There are several difficulties. First, it is a multi-layered message, and the communicating format tends to be simple; the way that We aRe Spindye communicates with the end consumer at present is mostly through a hang tag on the end products. Second, the message has a lot of noise to break through in order to catch the attention of the consumer, because of the jungle of products and information available. Third, the product information that We aRe Spindye gives to the end consumer is attached to their clients' products. This means that the information has to pass through the client brand's internal process of producing product information before it reaches the end consumer, which gives We aRe Spindye limited power over the design of the information.



Figure 1. The three stakeholder groups of the project.

Finally, We aRe Spindye lacks knowledge of the consumer and what they need in terms of information, which limits the efficiency of their communication despite the treasure of knowledge that We aRe Spindye possesses.

Design problem

Communicating this message while tackling these obstacles constitutes the design problem of this project. These obstacles will be approached with design in an endeavor to create a better communication between We aRe Spindye and the end consumer, via the fashion brands.

Aim

The first aim of the project is to explore how design can contribute to circular economy, by taking on the problems with communicating to the end consumer, using design.

The second aim is to specifically communicate We aRe Spindye's use of chemically recycled polyester in a way that highlights the breakthrough to the consumer, and stimulates the value that worn garments are a valuable resource and not trash.

Research questions

- How can a communication concept be designed that fuels circular values and practices in consumption among consumers?
- What are the drivers and barriers of communication between the three stakeholder groups, and what implications do they have for communicating the specific message of chemically recycled polyester?

Objective

The deliverables of the project are:

- Designing a communication concept that conveys 1) the breakthrough of the use of chemically recycled polyester as well as 2) the value that worn garments are a valuable resource and not trash, followed by motivation to apply circular practices. The recipient of the communication concept is the end consumer of We aRe Spindye's business clients' products.
- Designing a process for communicating to the end consumer via the business clients of We aRe Spindye, according to the prerequisites and needs of We aRe Spindye, their business clients and consumers respectively.

Report structure

The structure of the report follows the red thread of the project and begins with laying out the project in chapters "Introduction" and "Method", followed by the result of the project in chapters "Findings" and "Design concept". The "Findings" chapter reveals the insights from the three studies of the project, each followed by guidelines and a brief conclusion. The theory of the project is a part of the findings, and is explained continuously in the "Findings" chapter as it is brought up or referenced in the text. The "Findings" chapter ends with a final conclusion about the three studies and how they interconnect. The report ends with a reflection in chapters "Discussion" and "Conclusion".

Chapter 2: Method A design project has been undertaken to fulfil the objectives of the thesis. The approach taken to perform this project has been to create understanding of the end consumer perspective of consumption and product information, the business perspective of communication with the end consumer, and the the message that We aRe Spindye (from here on abbreviated WRSD) wants to communicate to the end consumer.

Once gathered, the knowledge from the three studies was fused together and analyzed in order to identify solution potential that could be used for the development of a design concept that serves all actors in the system.

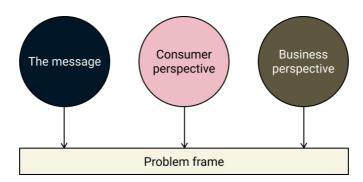
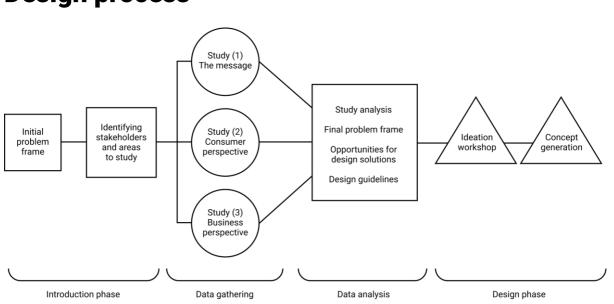


Figure 2. Three studies.

The most effort was put into understanding the end consumer, since this is the perspective that a user-centric designer might contribute with to WRSD, and the perspective that they have the least understanding of. Substantial effort was also put into understanding the message that WRSD wants to communicate and the business perspective, in order for said designer to understand those perspectives well enough to connect the three studies into an appropriate final problem frame.



Design process

Figure 3. Design process.

Figure 4 describes the red thread of the design process. The process was much more iterative than the figure describes, since insights from one phase would alter conclusions from earlier phases, and insights from one study would lead to revelation about earlier studies, leading to constant adjustments of the project and hopping back and forth between different phases. The more the project progressed, the more a red thread emerged.

Initial problem frame and design of study

The reason for choosing three viewpoints as subjects for deeper study in this project is that the issue needed a systems view to be understood. A system view zooms out from specificities and focuses instead at how they connect (Forrest, 2018). A systems view came as a natural consequence of the communication between WRSD and the end consumer being a system more than a singular communication path, because it passes through several gates including the internal processes of the client brand, which complicates the matter. In order to find the crucial drivers and barriers for communication in this system, all parts of the system had to be examined. Before the studies were performed, the need for a systems view was established in agreement with WRSD, who knew that the communication relies in part on their business clients.

Study

The project included studies of the three parts of the communication system: the message, the recipient (or the consumer perspective) and the communication path (or the business perspective).

Study (1): The message

In order to understand the content of the message that WRSD wants to communicate, a literature study was performed, followed up by an interview with a Sustainable Product Developer from WRSD, and following e-mail correspondence. The WRSD Sustainable Product Developer is the source of intel behind every information that refers to We are Spindye (2021). The message was studied for two reasons: 1) in order to understand it, to be able to properly communicate it in a later design. 2) in order to understand how transferring it could help the consumer to make their consumption more sustainable. The literature study focused on the significance of chemically recycled polyester, circular economy and the fashion industry's strategies to become radically sustainable. The interview focused on understanding the message that WRSD wants to spread, why they want to spread it, and how getting the message out would help the consumers to contribute towards a more sustainable fashion industry.

The literature was provided from WRSD and consisted mostly of reports of the current state of the fashion industry. The reports covered topics from collaborative efforts to transform the industry to a circular economy, to LCA analyses comparing the environmental impacts of different polyester types, to strategies the industry uses to become more circular.

The interview asked follow-up questions that arose during the literature study, and messagerelated questions including:

- What is the new offer you are making to your clients (regarding chemically recycled polyester)?
- What makes chemically recycled polyester so groundbreaking?

• Why is it important to communicate it to the consumers?

Any follow-up questions arising after that point were brought up in an e-mail correspondence with the interviewee.

Study (2): The consumer perspective

A user study was performed with 5 interviews. The interviews lasted for about 1,5 hours each. They were designed to cover the topics of consumption, recycling and product information, with questions like:

- What helps/hinders you from recycling?
- Can you tell me about a good and a bad purchase that you made?
- Which information is relevant to you as you buy, use and dispose of a garment?
- What are the pros and cons with these different information channels?

The interview was based on an interview guide with ten questions, but had an open structure; the participants were encouraged to talk freely about their experiences and expand on the parts that they themselves found more interesting, which led to the interviewees defining the context (Lantz, 2013). Some topics that were brought up by the participants were added to the interview guide along the way. This led to the interview guide evolving between each interview, creating five slightly different interviews, honed gradually, as opposed to the sometimes recommended process of launching a pilot interview, modifying it once and then sticking to the second version throughout the rest of the study. Letting it evolve gradually and organically suited the complex nature of the subject as well as the project style of the designer.

The interviews were held with 5 different participants. The sample was picked in consideration of age, life situation, interests, style and level of commitment to consuming sustainably (based on assumption), with the intention of creating a broad range within each category. The categories were chosen because they suggest different behaviours in consumption and different relationships to consumption. Due to the soft nature of the categories and in order to make sure there was a spread in them, the participants were picked from the designer's own network of family and friends.

Participant	Life situation	Interests	Style	Commitment
Woman, 32	Working mother of 2 small children (lawyer)	Family, social issues	Business Minimalist	Medium
Man, 29	Working (designer)	Nature, sports	Street Functional	High
Woman, 64	Working (midwife)	Family, cooking, crafting	Romantic	Medium
Woman, 30	Working mother of one infant (human resources)	Family, friends	Street Minimalist	Medium
Woman, 26	Studying (medicine)	Music	Color pop Utilitarian	Low

Table 1. Participants of the consumer perspective study.

Study (3): The business perspective

A study was performed with 2 interviews with one participant from WRSD and one participant from a business client of WRSD. The interviews were about one hour long each, and much like the consumer perspective study, the interviews were allowed to go where they wanted to. The interviews focused on the internal processes of creating product information, and communication with suppliers, clients and consumers. Questions asked included:

- Can you describe the process of designing information for your consumers?
- Who or what department decides what information the consumer gets?
- How does it work when suppliers want to attach information to their clients' products?
- What works well and what does not work well in the development of product information?

Contact with the participants was mediated by WRSD. Because they were, the size of the study was limited to the amount of participants that WRSD could provide.

Problem framing

Study (2), the consumer perspective study, was organized into an analysis with the help of an affinity diagram. The method was chosen because of its capacity to translate an organic mess into structured categories, creating an overview of the content of the study (Tague, 2005). The affinity diagram was followed by an extensive written analysis in order to further structure but also elaborate on the topics emerging from the study. The purpose of the analysis was to gather and structure the insights of what makes it hard and/or easy for the consumer to engage in circular practices, and to perceive product information, in order to be able to frame the problem. Lastly, design guidelines were extracted from the written analysis, based on needs expressed that could be connected to the design of information.

Two more design tools were used, modified to suit the project, in order to analyze the data from study (2). The first tool was *personas*, modified to *consumer driving forces*. Like personas, they are used to describe and explain often occurring, generalized patterns and behaviours of the user, in order to get a deeper understanding of the user's needs (Nielsen, 2013). Unlike *personas*, they describe driving forces instead of people. They were elicited by identifying the driving forces from the interview data in the affinity diagram.

The second tool was *user journey mapping*, modified to *garment use cycle*. Much like user journey mapping, it is used to illustrate how the user interacts with a product, in order to be able to more easily identify opportunities of interaction between product and consumer, and how to best communicate with the consumer at a certain interaction point (Ericson et al, 2016). It was elicited by identifying the steps of the use cycle from the interview data in the affinity diagram. The tool is named *garment use cycle* to give it a more accurate description of what it illustrates.

For studies (1) and (3), the message study and the business perspective study, mind mapping (Ericson et al, 2016) was used to structure the contents of the interviews and the literature. The mind maps filled the function that the affinity diagram filled in study (2), in the sense that they created an overview of the contents that could then be used to structure written analyses. Mind mapping was chosen over affinity diagrams in studies (1) and (3), because they were not as extensive as study (2), which allowed for the use of a less

demanding method. The insights from the two studies were listed continuously as they were found, followed by analyses and design guidelines.

Apart from being used to structure studies (1) and (3), mind mapping was also used throughout the project as a way of gathering thoughts, themes and topics that were hard to connect spontaneously. This resulted in a more reflective way of working than the more method-oriented way that is sometimes used in industrial design engineering contexts. This suited the complex, organic nature of the project.

The final problem frame was produced by combining the insights from all three studies in a conclusion of how they might work together. This was done by looking at the result of the studies from a systems perspective, by way of mind mapping, connecting the parts of the system and pinpointing the parts that were deemed important for the system at large to work.

Concept generation

The concept generation was kickstarted with an ideation workshop with 4 participants. The participants were industrial design engineers, asked to participate because of their skills in ideating and ability to understand a complex problem frame. The method of ideation workshop was used for the purpose of collecting as many ideas as possible, as well as for the opportunity to discuss what the best solution would be given the design problem. Since no specific format was required for the design solution, all ideas were welcome regardless of resolution or fidelity. The workshop included a brief of the problem frame, a warm-up session where the participants got to ideate for one minute each on four themes from the brief, and a main session where the participants ideated on how to develop a specific concept that was prepared before the workshop.

The workshop resulted in a multitude of ideas. Through discussion with the participants, the final concept was chosen. The final concept was built on several of the ideas from the workshop.

A few methods were designed as tools to assess the final design concept. The first is a *bar assessment system*. Each concept was equipped with a set of bars displaying an arbitrary level of five aspects that might affect WRSD's incentive to develop and implement the concept. The system also includes two bar charts that let WRSD compare how the concepts perform in relation to each other. The second is a *guidelines matrix* that shows which guidelines were fulfilled by each concept. Both methods were invented during the concept generation and do not stem from other methods. They were developed as tools to navigate the final design concept because of its diversity in strengths.

Chapter 3: Findings

Study 1: The message

The message Conclusion Guidelines

Study 2: The consumer perspective

Part one: The consumer Part two: Information Conclusion Guidelines

Study 3: The business perspective

The business perspective Conclusion Guidelines

The message

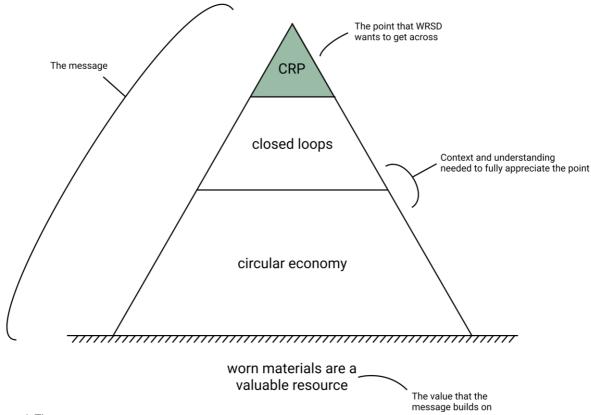


Figure 4. The message.

The message that this study explores is illustrated in the figure. The point that WRSD is most eager to get across is the significance of chemically recycled polyester (or CRP), but in order to fully appreciate the point, it is important to understand its context. The context that CRP operates within is closed loops, how they work and why that is important, and the context of why closed loops are important is how circular economy works and why that is important. The point together with all of its context, is what constitutes the message that the design concept of the project will communicate.

The entire message rests on the value that worn materials are valuable resources and not trash. This value permeates the context as well as the point of the message, and should be transferred to the consumer via any design solutions, even if it is not part of the message per se.

CRP vs. rPET

Polyester is a synthetic textile fibre made from polymers (Cowie & Arrighi, 2008). Three types of polyester are considered in this study. Virgin polyester refers to brand new polyester made from fossil oil, rPET refers to recycled polyester made from mechanically recycled PET bottles, and CRP refers to recycled polyester made from chemically recycled polyester textiles.

Material name	Product	Made from
Virgin polyester	Brand new polyester	Fossil oil
rPET	Recycled polyester	Mechanically recycled PET bottles
Chemically recycled polyester or CRP	Recycled polyester	Chemically recycled polyester textiles

Table 2. Three different polyester types.

Though no quantitative comparison of environmental impact has been made between the three¹, there are qualitative indications that virgin polyester is the least sustainable option, that rPET is a more sustainable option, and that CRP is the most sustainable option (We aRe Spindye, 2021). However, since there is no quantitative proof that one is better than the other, specifically depicting CRP as "more sustainable" than rPET should be avoided. Rather, it is advisable to present the strengths and weaknesses of each material, and let the consumer decide what they prefer based on the comparison.

Since the production of virgin polyester requires extracting fossil resources from the earth, it is generally accepted as an unsustainable material (see Closed loops). This reflects in the fact that WRSD does not use virgin polyester in their yarns and textiles. The comparison will focus on the two materials that WRSD does offer to their clients - rPET and CRP - since their comparative strengths and weaknesses are less obvious.

Textile quality: CRP vs rPET

In the process of recycling PET bottles into rPET polyester, the bottles are mechanically ground. This breaks the chemical structure of the polymer, which makes the polymer weaker. This results in the recycled product's quality being compromised, which might make a garment made from this material have a shorter life before it tears, and might reduce the performance of a functional garment (We aRe Spindye, 2021). This results in the need to add fresh material, which leaves the loop not fully closed (Keßler et al, 2019). This material can be recycled again but will maintain its compromised quality.

CRP on the other hand is recycled chemically, which means it goes from textile fiber to textile fiber in the recycling process. This preserves the chemical structure of the polymer and restores the textile to its original quality. This means it is as durable and performative as virgin polyester. In theory, it can be recycled an infinite amount of times without losing its quality (We aRe Spindye, 2021).

Raw material: CRP vs rPET

The chemically recycled polyester that WRSD uses in their textiles and yarns is made from worn Chinese school uniforms (We aRe Spindye, 2021). The big advantage of using school uniforms is that the recycled product can be produced at scale because of the quantities available. It does not require parts of the infrastructure that recycling private post-consumer textile waste does, such as sorting facilities. Such infrastructure is currently missing or not developed enough to recycle private post-consumer textile waste at scale. Meanwhile, if the

¹ One comparison has been made between virgin polyester and two variants of chemically recycled polyester in an LCA analysis (Intertek, 2017), indicating that chemically recycled polyester has less environmental impact than virgin polyester in the aspects of greenhouse gas emission, cumulative energy demand and water consumption, if there is equilibrium between offer and demand in recyclable materials.

industry and the consumer starts producing and purchasing items made of CRP, a demand is created which is an important stepping stone of building up the infrastructure needed to get the use of private post-consumer textile waste as raw material going. Private postconsumer textile waste as raw material is less predictable, which is why it needs more infrastructure, but is desirable because it has a much greater potential of being "locally produced", and can absorb some of the textile waste produced by private consumers, helping to close the loop of the fashion industry (see Closed loops).

PET bottles as raw material has a threefold problem framing. The first problem is that putting a demand on the PET bottle industry, means by extension putting a demand on the bottled water industry, which is a largely unsustainable industry that is responsible for lots of resource depletion in its production (We aRe Spindye, 2021). The second problem is that the demand for post-consumer waste PET bottles creates an opportunity for dishonest companies to produce PET bottles, only to sell them directly to recycling companies labelled as post-consumer waste, when in reality it is virgin PET that was never used. This corrupts the recycling industry and subjects fashion brands to greenwashing. The third and final problem is that relying on a foreign industry for raw materials hinders the progression of the fashion industry closing its own material loops (see Closed loops).

Chemical vs mechanical processing: CRP vs rPET

The process of recycling polyester textiles chemically does, as the name implies, demand the use of more chemicals than recycling PET bottles mechanically. The environmental gain of recycling chemically compared to recycling mechanically can according to WRSD be viewed as exceeding the environmental loss due to chemical consumption because of all the reasons mentioned in this chapter. However, the word "chemical" can have a certain negative charge in sustainability contexts. The consumer might interpret "chemically recycled polyester" as something highly environmentally taxing, especially compared to "mechanically recycled PET bottles" which does not imply chemical consumption. It is easier to visualize where the raw material came from and that it is in fact post-consumer waste in the case of mechanically recycled PET. In short, the consumer might assume that CRP is less sustainable than rPET unless an explanation is given. This needs to be taken into account when communicating, and if the word "chemical" is used it might have to be addressed directly in communication.

CRP's role in the circular economy

The use of chemically recycled polyester should be viewed as a part solution to achieve a circular economy within the fashion industry. Scaling up the production of CRP so it matches the demand for polyester requires a lot of infrastructure that is taking shape but is not fully in place yet. Innovation, recycling facilities, manpower for sorting, legal regulations, international collaborations and so on is needed in order to scale up so the material loop of polyester can be closed (see Closed loops). All this is dependent on the demand that the consumer creates by choosing one material over another. This is why the consumer makes a difference if they choose a garment made out of CRP instead of rPET. It has a ripple effect on the industry; not only a net CO2 impact (see Brand focus vs. garment focus).

Circular economy

The message of circular economy might be the hardest to transfer to the consumer given its complex nature. The basic understanding of circular economy is that we now live in a linear (or wear-and-tear) economy, extracting materials from the earth, making products that we wear and tear and then trash, which exploits both material and human resources. Circular (or

cradle-to-cradle) economy is a vision that takes care of old products and byproducts and uses them as raw material of new products, preferably after being used for much longer than products of the linear economy. This way resource depletion and pollution is diminished. The fashion industry largely recognizes that transforming into a circular economy is the only sustainable way to keep the industry. The Global Fashion Agenda has established specific, common goals for the industry to strive for in the pursuit of circular economy. A "circular fashion system" is one of their four transformational priorities for fundamental change, and is in summary achieved by designing, producing, selling and collecting products that enable the reuse and recycling of post-consumer textiles at scale (Global Fashion Agenda, 2019). The Nike Circularity Workbook agrees to this by defining circularity as "Creating products that last longer and are designed with the end in mind." (Nike, 2019).

A way of thinking

Besides being the antithesis to the linear economy that we mostly live today, however, circular economy is best understood as a way of thinking that is used to approach a very large and complex problem. The challenges of transforming into a sustainable industry are countless. The available technology and solutions are ever evolving. Most of all, there is no "right" answer to how a circular economy is achieved. Therefore, there's no circular economy manifesto or set doctrine that guarantees that it is done right. Rather, it is a way of thinking that constantly asks the question of how a product or a process can be made better according to the common goals of the circular vision. It is incremental changes and small part-solutions to achieve long-term, radical, systemic change, that builds on cooperation between consumer and industry that is intentional and thought through.

Nobody has the golden answer. But our questions about our own processes and learning from others moves us all forward.

Golnaz Armin, Senior director, Materials design, Nike sportswear. Nike (2019).

The whole framework for it was a massive "How might we..." question. $\sim ~ \langle \gamma \rangle$

Joanne Jørgensen, Director, Materials design, Nike Knit. Nike (2019).

The nature of circular economy

At its core, circular economy is collaborative. The industry collaborates with the consumer. The different actors of the industry collaborate with each other. Technical innovation depends on other technical innovation, and circularity principles depend on other circularity principles. As stated by Joanne Jørgensen², director of materials design at Nike Knit, in an

² The Nike Circularity Workbook is a tool made by Nike that guides fashion companies towards circularity, by proposing questions to ask during product development that stimulate a circular way of thinking (Nike, 2019).

interview in the Nike Circularity Workbook, "It's really exciting and compelling that so many circularity principles interweave: waste avoidance, new business models, repair, durability, and versatility." (Nike, 2019). Aspects of circular economy seem to serve each other; the circular solutions do not seem to work at the expense of each other.

As a natural consequence, circular economy is also transparent. It welcomes third-party examination and works towards becoming transparent through all its production chains. That leads to high standards in choice of factories, which serves humans and nature, and closing loops, cleaning up after themselves. This is in stark contrast to the linear economy, that at its core is competitive, which in the same way makes it opaque and exploitative of both human and material resources.

Linear economy	Circular economy
Competitive	Collaborative
Opaque	Transparent
Depletes resources and pollutes environment	Closed loops
Exploits humans and nature	Serves humans and nature

Table 3. Characteristics of linear vs. circular economy.

This is one of the reasons that WRSD is eager to understand the consumer; in order to better collaborate with them, so they can work more effectively towards common goals.

Brand focus vs. garment focus

A brand striving towards a circular economy will have a circular mindset. This mindset will bleed the characteristics mentioned in table 3, and those characteristics will be visible to the consumer, partly because of the transparency that comes with a circular mindset brand, and partly because they are becoming selling points as the consumer becomes more and more aware of sustainability issues within the industry, which is why the brands will be eager to put these characteristics on display.

This means that if a consumer wants to draw conclusions about the sustainability of a purchase, they should be brand-focused, as opposed to garment-focused. A common misconception among consumers who are interested in the level of sustainability in their purchase, is that the sustainability lies in the environmental net impact of an isolated garment³. The garment focus makes the consumer zoom in on factors such as the material of the garment, which is not wrong, but might say less about the sustainability of the purchase than the mindset nature of the brand they buy it from. A brand focus recognizes that much more of the sustainability lies in what kind of thinking or what kind of economy the consumer supports by making a certain purchase. The brand focus zooms out to brand characteristics and knows that by supporting a brand that possesses such traits, they create a ripple effect in the industry, paving the way for circular economy by investing in it.

³ This is why it is relatively easy to greenwash a garment. A brand can claim that a garment is made of organic cotton, or even *make* the garment out of organic cotton, but have a linear mindset and produce the garment under highly unsustainable otherwise circumstances, while still appearing circular or sustainable to the garment-focused consumer. A brand-focused consumer, however, will be able to see whether the "organic cotton" information lines up with the other values of the brand - either linear or circular, and get an indication of whether the claim is greenwashing or not.

One of the most important reasons that WRSD are interested in understanding the consumer so that they can better collaborate with them, is that they are dependent on the consumer to choose to purchase from circular mindset brands in order for the circular industry to kickstart, build the infrastructure it needs, and scale up. Scaling up is important for two things: 1) making sustainable clothing more accessible for more people, so fewer people have to buy unsustainable clothing. 2) Making sustainable clothing more sustainable. There are factors in the LCA formula regarding supply and demand, that have considerable impact on the net sustainability of the garments (Intertek, 2017), and CRP still has to grow before it becomes efficient enough to serve sustainability purposes at its full potential. Unlike virgin polyester and rPET which have had longer time to develop as industries.

Reflecting forward to the consumer perspective study, it is also highly interesting for the consumer to understand how their consumption impacts the industry and the environment. Spreading the message of brand focus versus garment focus would therefore be highly beneficial for both parties, initiating a circular collaboration between consumers and the industry.

Closed loops

A closed loop system is a circular objective that strives to make materials (in the form of products) circulate within society for as long as possible, instead of wasting them. A closed loop means that any company that issues products does their best to make sure to use as little virgin material resources as possible in the production, and that as little as possible of the product is wasted once it is used up. Doing this relies on recycling, both for supplying recycled materials for production, and for avoiding wasting the used products. The ideal way of closing the material loop is to only let material resources circulate within one industry, by using recycled material from the same industry as raw material for new products.

An example to illustrate the significance of closed loops is the use of recycled PET bottles within the fashion industry, as mentioned earlier in this chapter. Instead of using the waste from the fashion industry to produce raw materials, the industry uses waste from the bottled water industry. Although it is better to use waste from any industry than using virgin materials, it is not as simple as that. The polyester industry's use of the waste from the PET bottle industry could be considered "closed loop" in the sense that they both fall within the plastic industry, but it can also be considered "open loop" in the sense that the fashion industry and the problems that come with that (see Raw materials: CRP vs rPET). In conclusion, the more a loop "bleeds" into or depends on other industries, the more complex the challenges get, and the less power the industry gets to work towards a clean and sustainable production.

Working towards closing the loop includes designing for the products to be recyclable, possible to disassemble and replace parts, but also designed for use so that they will be used for as long as possible.

The consumer's role

Closing the material loop ultimately lies in the hands of the consumer, since they make the decision of what happens to a garment that they no longer want to use. However, it is the industry's responsibility to provide the possibility to recycle. Recycling is therefore a collaborative endeavor, in which the consumer needs to know their role.

Waste hierarchy

The *waste hierarchy* is the preferred order of fates that can happen to a product that is no longer in use, from a resource efficiency standpoint. When a consumer decides that a product they own no longer serves them, such as if it breaks or they lose desire to wear it, the best thing they can do with it according to the waste hierarchy is to keep using it anyway. After the best option follows reusing the product (giving it to someone else), repairing the product, recycling the product, downcycling or recovering any energy from the product (such as incarcerating it), until the worst option to be avoided at all cost which is to throw it in the trash (Directive of the European Parliament and of the Council 2008/98/EC). The circular practice that ties to the waste hierarchy is to make sure any product that one has decided to dispose of, ends up at the highest possible level of the waste hierarchy. This way the material stays in the loop for longer, and less fresh material has to be extracted from the earth.

Life Cycle Analysis

A *Life Cycle Analysis* or LCA is a standardized framework to assess the environmental impact of a product, a material, or an entire company. The tool is designed to analyze the entire system of factors that affects the total impact of the product life cycle, resulting in the ability to put numbers on the sustainability of a product, that gives a company the possibility to answer questions like what its emissions are, how it compares to other products, and what the biggest levers to reduce the impact of the product are. It follows a 4-step process which is defining the scope and goal of the analysis, life cycle inventory (or collecting the data needed for the analysis), impact assessment, and lastly, interpretation (or how to read and use the analysis). The LCA is a professional tool that requires access to life cycle inventory databases in order to be made. (Svenska institutet för standarder [SIS], 2006)

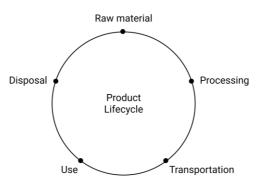


Figure 5. Product lifecycle.

An example of an LCA and its results is the analysis of a fashion product made by Ecochain for one of their clients. The LCA showed that the biggest environmental impact occurred in the use phase of the life cycle, which resulted in the fashion brand reaching out to their customers to educate them about sustainable use (Liebsch, 2020).

Recycle!

Finally, a lot of the message can be condensed into one, encouraging prompt: Recycle. This has been said between the lines, but deserves its own heading in a study exploring what message to communicate to consumers to get them to contribute to the circular economy. This is the call-to-action that the founding value points to and a circular principle that leads to the closing of loops and the establishing of infrastructure, that is dependent on the collaboration of consumers.

Conclusion

Message content

The message that is to be communicated to the consumer is the significance of chemically recycled polyester and its role in circular economy, what circular economy is and how it works, and the core value that worn materials are valuable resources and not trash, with the call-to-action that is: recycle.

The significance of chemically recycled polyester lies in several points. The most important one is the way it closes the material loop of the fashion industry, which is an important objective of the circular economy. Other than that, it has quality advantages in comparison with rPET, and comes from a more sustainable raw material source than rPET. Scaling up the CRP industry is a part solution in creating a circular economy.

The circular economy is a collaborative endeavor that strives to reduce resource depletion and waste by making materials circulate within society for as long as possible. Pursuing circular economy is a way of thinking more than it is a set doctrine, and a direction more than it is a set goal. It has a nature rather than a manifesto.

The message should be communicated in its entirety as well as in separate parts, because of its T-shaped nature. In order to understand the significance of the specific message of CRP, you have to also understand its context. This project strives to communicate the significance of the specific message of CRP, and therefore it also takes on the task to communicate how the context works.

Message significance

The reason why this message helps the consumer to collaborate with the industry towards circular economy is twofold. One, the consumer needs to understand that they have actual power to make a difference by the choices they make, in order to be motivated to make those choices even though it might be more expensive.

Two, apart from communicating a certain message and a certain value, a certain way of thinking should be communicated through the message of circular economy. For the consumer, this looks just like what it looks like for the industry; having a problem-solving mindset that constantly asks questions of how to be more sustainable and more circular, making small, incremental changes, and viewing it as a process of trial and error in the pursuit of learning rather than viewing it as a definitive right or wrong. In the end, this explorative way of thinking should naturally further promote CRP, but also every other circular endeavor. In short, communicating in a way that not only promotes an isolated subject but teaches the consumer how to recognize circularity within the industry at large.

The consumer should be encouraged to learn how to recognize circularity. One form this takes is assessing the sustainability of a purchase by zooming out to a brand focus and seeing what circularity traits they have, instead of staring blindly at the environmental net impact of an isolated garment.

Design guidelines

- The message of chemically recycled polyester and its context should be communicated in its entirety as well as in its separate parts.
- The message should be permeated by the core value.
- The comparison between CRP and rPET should be communicated, with facts but not necessarily with conclusions about which one is more sustainable.
- The negative charge of the word "chemical" should be considered when communicating the message of chemically recycled polyester.
- CRP should be communicated as an incremental step or part solution towards circular economy.
- Circular economy should be communicated at both a basic level (strives towards reducing resource depletion and waste) and a nuanced level (way of thinking).
- Circular economy should be communicated as incremental changes and small partsolutions to achieve long-term, radical, systemic change that builds on cooperation between consumer and industry that is intentional and thought through.
- The consumer should be taught how to be brand-focused instead of garmentfocused in their assessment of sustainability.
- The consumer should be taught what a closed loop is.
- The consumer should be taught what the waste hierarchy is.
- The consumer should be encouraged to recycle.

Consumer perspective

A user study was performed in order to understand the consumer's perspective on consumption and product information. The aim of the study was to build understanding of how the consumer reads and uses product information and how that affects their consumer behaviour, and the objective was to translate those insights into design guidelines.

The first part of the analysis deals with the consumer, how they think and behave in relation to consumption. The second part deals with product information and how the consumer relates to that. The conclusion of the analysis is how these insights should be interpreted and used in light of the design problem, and last but not least a list of design guidelines.

Part one: The consumer

This part of the analysis investigates the consumer and how they relate to consumption of clothes. It will be investigated in terms of *circular practices*.

Circular practices is a term that this project came up with to describe actions and behaviours that according to the message study contribute to circular economy. These practices include anything that makes materials circulate for as long as possible within society such as making conscious decisions to buy fewer garments with long life span, buying sustainably produced garments, taking actions to prolong the life of the garment, and making sure the garment ends up at the highest possible level of the waste hierarchy at the end of the consumer's use of it.

This is opposed to *linear* or *non-circular practices*, which refer to actions and behaviours driven by a wear-and-tear mentality around shopping, mindless of circular economy, buying more garments with short lifespan, buying unsustainably produced garments, not caring for the garment during use and throwing it in the trash when it is no longer wanted.

This part will also address the *circularity movement*. This is also a way for the project to put a name to the different forces and agents that strive to make the fashion industry circular, which sometimes are brands within the fashion industry, sometimes organizations, sometimes governmental initiatives and sometimes individuals. These are not officially affiliated but describe actors that strive towards a common goal.

Driving forces and informed decisions

To empathize with the consumer well, it is important to understand why the consumer consumes the way they do. Two themes that help to understand this emerge from the user study. The first one is *informed decisions* and says that it is in both the consumer's and the circular economy's interest that the consumer makes purchases according to what is a well-informed decision for them. The second one is *driving forces behind consumer behaviour* and says that certain needs drive consumer behaviour and that these in part determine what constitutes an informed decision for the consumer. Both themes are a product of the study analysis, and do not make any claims to be true, but are used to frame the designer's understanding and interpretation of how the consumers work.

Informed decisions

An *informed decision* behind the purchase of a garment means that the purchased garment meets the consumer's needs well which leads to the consumer getting a lot of use from it.

Making an informed decision can be accomplished in an instant via gut feeling, or after weeks of researching. The key is that the consumer knows what they want and need and that the garment informs them that it meets those needs, either via product information or via the product itself.

It can benefit both the consumer and the circular economy when an informed decision is made behind a purchase. According to the user study, an informed decision increases the chance of the consumer liking the product, which in turn increases the likelihood that the consumer applies circular practices to the garment such as wearing it often, taking care of it, and recycling it at the end of its life. Liking the product can therefore be assumed to reduce the wear-and-tear mentality around products, and increase the mentality that worn materials are a valuable resource. This mentality as well as anything that benefits both consumer and circular economy are desirable outcomes of this project, and therefore, it becomes a priority to make the information design help the consumer to make an informed decision.

What does an informed decision look like?

What constitutes an informed decision differs from person to person and from purchase to purchase. These criteria are the ones that the 5 participants of the user study mentioned, without order of importance.

- The consumer gets a lot of use from the product
- The product suits the intended area of use
- The quality is high
- The price is adequate
- The purchase was a good deal
- The life span of the product is long (before it is worn out)
- The life span of the product is long (trend and fashion wise)
- The product can be washed easily and a lot
- The product has high performance (if it is a functional garment)
- The product is comfortable
- The product is made from a material known to the consumer
- The product has good fit
- The fit does not change
- The product looks good
- The product has the right cut for the consumer
- The product is unique
- The product is socially adequate
- Somebody the consumer identifies with owns the same product and is happy with it
- The product comes from a brand the consumer trusts
- The brand has a visible analysis on sustainability
- The product claims to be sustainably and ethically produced
- The purchase is driven by need rather than desire
- The consumer has sought information beforehand
- The consumer has received good information in store

How can information design help the consumer make informed decisions?

While it is up to the consumer to figure out what makes an informed decision for them, there's an opportunity to help them by making the product information as clear and unambiguous as possible. One central theme from the user study is the fact that the consumer often finds it a burden to interpret the product information in order to figure out how the garment stands out in meeting their needs among other garments of the same

product category. There are countless options on the market and the consumer has limited ability to take them all in, weigh them against each other and assess which one meets their needs best. Questions that might arise during the labor of sifting through this jungle of assessing products include: How do I know that this garment is the most suitable for my intended use? How do I know if this certification is greenwashing or not? Is this last year's model or current, and what's the difference? Is this more or less sustainable than some alternative with a similar sustainability related buzzword on the hangtag? And so on. The sifting and interpreting become an extra cognitive load for the consumer which makes them less effective in actually making an informed decision. If the information is clear, both visually and content wise, it seems to ease the burden.

The user study indicates that the consumer for this reason highly appreciates when the information tells a story about the product or the brand, answering questions like: what was the thought behind this garment? Why was it designed? Does it belong to a certain collection, and what's the story behind that collection? Did the designers envision the garment in a certain context of use? A story has a unique ability to capture the interest of the consumer and communicating that it was made with intent. It also carries the power to let the consumer understand the thought behind this garment, which makes it stand out better among its alternatives, which could ease the burden of sifting through the jungle of products, which could help the consumer to make an informed decision.

Knowing that the product was designed with intent potentially also communicates that it is precious, and reduces linear wear-and-tear mentality around the garment. For all the reasons mentioned, storytelling becomes a candidate for design solutions of this project.

Another idea is that the product information could help the consumer make an informed decision if the information is designed with the target group of the product in consideration, and estimating what criteria most likely constitutes an informed decision among them. The list of possible criteria gives an indication of what the consumer might be looking for, which can be used when evaluating the target group in order to determine the product information. This can be done for example during the process of producing product information, by asking the questions: which of these criteria would the target group be looking for? And: which of these criteria can be communicated via product information?

Driving forces

In order to find the target group for the project, it is useful to look at the driving forces of the consumer, which is the second theme that's important in order to empathize with the consumer.

The following driving forces behind the participants' consumer behaviours and decision making processes were found in the study. The descriptions are a generalization of how a person leaning towards a certain driving force might function.

1. *Nature, outdoor life, sports and adventures.* Nature as a driving force instills respect for material resources. It often comes with circular practices such as investing in products with high performance, that lasts for a long time, that is frequently used, that is cared for and mended if needed, and that the consumer builds a relationship with. The nature-driven consumer assumes that thrifted items or hand-me-downs are a worthy option to brand new products, and that a lot can be self-produced. This behaviour applies primarily to outdoor garments, but the behaviour often bleeds over into their view of consumption and products at large, including their consumption of

everyday wear. They are resource effective in the sense that they buy the products they need and wear them out, instead of owning things that lay around untouched.

- 2. *Making the everyday life puzzle work.* The "working parents of toddlers" or other busy people are a group of consumers driven by practical opportunity in their consumption; an informed decision for them is a purchase that serves the everyday life and makes it easier. It can be a parka that is durable enough to wear at a playground, but dressed-up enough to wear to the office; which reduces the amount of changes needed on a day where both events happen. It is also important that the garment can take a lot of washing. This consumer is not afraid to buy a lot of products even if they lay around unused, since it is more important to make life work, than being resource effective. But they are also ready to invest in products that can be used for a long time rather than consumables, in order to avoid the practical hassle of having to buy new things.
- 3. *Style and social adequacy.* Style as a driving force behind consumer behaviour means that if a garment fits into the social context one dwells in, then it is an informed decision to purchase it. This *can* lead to a resource effective closet and finding ways to express style without having to buy brand new products on the regular, but there is also a risk that a very linear wear-and-tear consumer behaviour is established when this is the driving force, depending on the social context of the individual and whether the style is trend-bound. For the style-driven consumer, it is more important to fit into one's social context than keeping the consumption down.
- 4. Luxury, quality, previous financial limitations. Consumer behaviour can also be driven by getting a certain sense of luxury. People who during their upbringing or earlier in their life didn't have the financial means to opt for products of high quality but do now, can have a tendency to pick exclusive products over cheaper ones. The benefit of this behaviour is that chances are the high quality ensures that the product lasts long, that the consumer attaches to the product since it is an emotional driving force, and that the high price of the garment also comes with a legitimate sustainability policy at the brand who produced it. People with this driving force experience the value of the garment tangibly, since it has an emotional value to them from the start, which reduces the risk that they treat it as a consumable.
- 5. Sustainability. The aware consumer driven by the climate threat and social and environmental issues will typically have a "bank" of brands that they shop from, that they know have legitimate sustainability policies, because they spent time researching it. They will thrift, and they will let the degree of environmental impact and social sustainability of the production guide their purchase. They get educated, they mend and they recycle because they find it rewarding. Style, luxury or everyday life is not something that will make the sustainability driven consumer compromise with the sustainability standard of their purchase.
- 6. *Temporary desire*. Most consumers fall into temporary desire from time to time, even the ones actively striving not to. This driving force is the one that comes with the highest risk of making an uninformed decision since there is often no actual need

driving the purchase. Therefore this driving force is also the one that comes with the least circular practices naturally. This driving force is the only one to be considered inherently bad for the intents and purposes of this project, and also the one that there is not much to do about, except that the temporary desire can decrease if the consumer is helped to make informed decisions and over time learns that there is greater reward in making such investments than it is giving in to temporary desire.

The consumer usually has one of the above as a primary driving force behind their behaviour, but can also have several competing driving forces, or vary depending on the season in their life and the needs that come with that. Having children or experiencing an awakening in dedication to the climate are mentioned in the study as changes contributing to the switch from one driving force to another.

The consumer might have a lot of good reasoning when it comes to sustainability and circularity, but when it is time to make an actual decision about a purchase, the user study points to the primary driving force getting the last say. The user study suggests that even consumers that are not driven by sustainability do have a general interest in sustainable consumption, but that their main driving force trumps that interest when they actually make a purchase. Sustainable production is viewed as a bonus, not a requirement. That means that if they choose between two products, they pick the alternative that meets their use needs over a sustainable alternative. Such a consumer's commitment to sustainability stretches as far as taking note of the garment's degree of sustainability when they make a purchase, but not as far as picking the sustainable option.

In other words, it does not seem to matter how motivated the consumer is to consume sustainably if doing so conflicts with their needs. Because of this observation, this thesis holds the standpoint that:

• A sustainable and effective strategy to spur people to become sustainable in their consumption is to help them do so within their current driving force, as opposed to converting their driving force into sustainability.

While it is beneficial for the circular economy when somebody becomes genuinely driven by sustainability in their consumption, it is a very high standard that requires a substantial effort from the consumer. The user study reveals a clear tone of weariness among the participants whenever the topic of personal responsibility of living up to these standards comes up. The weariness seems to come from a sense of "not doing enough" compared to sustainability driven consumers.

As Mistra Future Fashion (2019)⁴ puts it, "At present, there is a discrepancy between attitude and action. A majority of users express an intent to act and consume in a more sustainable manner, but this intention is not reflected in their actual behaviour."

Questioning for a minute that the consumer does not do enough, the circularity movement sometimes aims to increase commitment in consuming sustainably in consumers by pushing for circular practices. While it is not inherently bad to encourage the consumer to perform circular practices, pushing for circular practices per se does not take the consumer's needs into account, which makes it only about "doing better" and not about

⁴ The Mistra Future Fashion Outlook Report (2019) concludes the result of an eight-year research project aiming for systemic change in fashion.

collaborating with the consumer to create a consumption that both consumer and circular economy is happy about.

The user study makes it clear that the low- to medium-committed consumer seems to associate "doing enough" to sacrificing their own preferences and needs in favor of "sustainable products", while the highly committed consumer associates "doing enough" to carefully thinking through their own preferences and needs and acting on them. The highly committed consumer also seems less burdened than the low- to mid-committed consumer.

As established earlier in this chapter, thinking through driving force, preferences and needs spur informed decisions, which the study suggests naturally leads to circular practices. It can be concluded, then, that the notion that sacrificing preferences and needs would be the only way to consume sustainably, is a misconception. It seems that catering to the consumer's need for making informed decisions according to their use and their driving forces might be more effective in spurring circular practices, than spurring circular practices per se. The perceived duty to be more circular or sustainable tends to put a heavy burden on the consumer, that kills the motivation, while liking their products drives motivation while also serving their use. In conclusion, it is possible that liked products are sustainable products, to some extent.

Or in the words of the Mistra Future Fashion Outlook Report (2019): "the easiest way to reduce impact from clothing consumption is to extend the active lifetime of a garment and thereby offsetting new production. Hence, the most sustainable garment of today is already in our wardrobes."

While the statement that "liked products are sustainable products" is an obvious oversimplification of the matter that needs to be researched before it can be determined as valid, it does resonate with the earlier explored notion that circular thinking builds on collaboration and mutually beneficial actions (see The nature of circular economy). In this case, mutually beneficial between the consumer and the circular economy. Both consumers and the circular economy benefit from the consumer owning the product for longer and taking good care of it. It is also regardless of validity an idea worth exploring. One, because the strategy to directly push for circular practices does not seem to be very effective in creating circular practices, and tends to be quenched by the consumer's driving forces at the point of purchase, which points to the need for a different strategy to motivate. Two, because it is entirely possible to combine encouraging the consumer to think through what they want, with encouraging the consumer to apply circular practices, without encouraging overconsumption. In short, this opens up the possibility that the consumer can enjoy their products more while reducing their consumption. The implication for design of communication then becomes: encourage and lead the consumers to make informed decisions that lead to owning products they like.

Not taking the consumers' needs into account when informing them of how to be more sustainable in their consumption is bound to lead to unmotivated consumers. This project, being driven by the consumer standpoint, picks up the tone of weariness among the consumers, and also the fact that the consumer commitment already is quite high, and tackles the problem instead by assuming that there is opportunity to make it easier for the consumer to apply circular practices within their driving force. It breaks down the question of "how can we make the consumers do better?" into the smaller, more digestible question of "how can we make it easier for the consumer to do good?".

Just like the rest of the circularity movement, this project still aims to motivate the consumer to circular practices. However, whenever this project mentions motivation, it strives to motivate by instructing, lifting burdens and making things easier, instead of demanding the consumer to do better.

Barriers for circular practices

The user study shows that there are tangible reasons behind consumers choosing not to commit to circular practices. The consumer can be highly engaged in sustainability, and yet make the same linear action over and over again. This is not necessarily because they are not committed enough, but because there are barriers in conflict with their driving force. The user study picks up the following reasons behind non-circular behaviours among consumers:

- The consumer lacks knowledge of circular economy in general
- The consumer lacks knowledge of how to perform certain circular practices (such as turning in garments for recycling).
- The consumer feels like circular practices require a lot of knowledge, and that it is too time consuming to gather that knowledge.
- If it is practically demanding or cumbersome to perform a certain circular practice.
- If the circular practice demands special equipment (such as a sewing machine) that the consumer does not have easy access to.
- The consumer sometimes feels lazy and does not prioritize making the effort.
- The consumer does not feel actively encouraged, specifically to recycle.
- Some consumers think it is a non-issue whether they for instance throw a used jacket in the trash or turn it in for recycling, because it is something that happens so rarely. They do not feel like it makes a difference. They think they have already pulled their weight by making a conscious decision when they bought the garment, and conclude that it is not that big of a deal whether they recycle it or not.
- If it is a garment that was purchased based on an uninformed decision, that they consequently do not have any emotional connection to and therefore view as trash, they are not likely to take actions to prolong its life or recycle it.

Two themes emerge from the barriers: one is thought issues, and one is practical issues. The practical issues, such as the lack of special equipment, might be best tackled by other measures than product information, such as services and infrastructure. The thought issues, however, can be approached via product information. These issues range from lack of knowledge, which leaves the consumer without incentives to perform circular practices, and is fully fleshed out in the "knowledge among consumers" section, to lack of encouragement, to lack of emotional connection to their garments.

A few guidelines for designing product information can be derived directly from this, including that the information should actively encourage the consumer to incorporate circular practices in their use and disposal of the garment, the information should inform the consumer of how to incorporate circular practices and how it makes a difference, the information should provide relevant instruction, the information should help the consumer make an informed decision to purchase, and the information should transfer knowledge to the consumer. The last guideline will be broken down further in the "knowledge among consumers" section.

Drivers for circular practices

The user study however also indicates that there are concrete things that drive circular practices, which might be useful when it comes to the design of information.

- When the consumer finds that it is better for the environment.
- When the consumer finds that it is better for their personal economy.
- Owning products that came through an informed decision to purchase, that the consumer is happy with.
- Positive expectation to perform circular practices.
- Active encouragement to perform circular practices.
- Services and business models that make it easy for the consumer to perform circular practices.
- Services and business models that reward circular practices with monetary return on investment to the consumer (such as discounts as a reward for recycling).
- Services and business models that reward circular practices with emotional return on investment to the consumer (such as giving quantitative information about environmental savings the circular practice caused).
- Services and business models that serve the consumers' driving forces.
- Services and business models that explain how for instance recycling works in a way that makes it easy to understand.

It is evident that the consumer seems to rely more and more on new services and business models in order to achieve a circular consumption. This is an opportunity for the fashion industry to make it easy for the consumer to become more circular, by launching such services. This further highlights the fact that the consumer finds it heavy to take their own responsibility to build circular practices.

One way to make it easy for the consumer to perform circular practices is to take advantage of the fact that they are driven by the knowledge that it is good for both environment and personal economy, by rewarding circular actions with concrete return on investment, either monetary or emotional. The user study points to the consumers appreciating the opportunity to put the responsibility in the hands of services, assuming that the services have better knowledge of sustainability than the consumer does.

In addition, the consumer seems to find it motivating to be *expected* to perform circular actions. One example that illustrates this is a study participant who came across the expectation to take circular action in children's apparel, in an outdoor garment that had a patch in the lining for writing out the child's name. The brand had taken the opportunity to design the patch with several name rows instead of just one, titling the rows "User 1", "User 2" and so on. This is a design technique called *nudging*⁵ which is specifically formative for user behaviour, and in this case arguably also for the user's values, because it introduces a standard to the user that the garment should be worn by several kids. This example normalizes hand-me-downs while making it easy for the user to pay it forward. Other participants bear witness to similar nudges found in the garment's lining that encourages recycling of the garment post use. This type of prompt that creates expectation seems to be appreciated by the consumer and seems to motivate without adding burden.

⁵ Nudging is a strategy originating in behavioural science that can be described as minor design changes that have a major effect on the behaviour of an individual (Thaler et al., 2008).

Knowledge among consumers

The study found that the interviewed consumer lacked knowledge in many relevant areas, including the following:

- Which materials are recyclable.
- How to turn in textiles for recycling.
- Whether one's textile waste actually is recycled if it is turned in for recycling.
- What level of the waste hierarchy the garments end up on at recycling.
- What a garment is turned into when it is recycled.
- What happens in recycling technically.
- What polyester is and that it is a polymer.
- What other properties different materials have; especially synthetic materials, mixed materials or materials that are "new" to the market.

Two general guidelines concerning the consumer knowledge is that the information should transfer this knowledge to the consumer, and that the information should be as concrete as possible. The user study implies that concrete information helps the consumer to understand and engage in the information. Concretizing information might look different from case to case. It can look like everything from sharing technical details of how something works, to illustrating something usually non-illustrated, to letting the consumer touch a material sample instead of describing how it feels. This guideline should work as a rule of thumb or way of thinking, rather than specifying how the concretizing should work.

Recycling

The user study points to the consumer lacking knowledge about textile recycling and that the level of knowledge has a direct effect on whether they recycle their textiles or not. They typically have a *mental model*⁶ of recycling originating from experimenting with recycling cardboard in middle school science class, but they do not really know how textiles are in fact recycled. The lack of knowledge does not however originate from a lack of engagement or interest in circular consumption, and there is an openness and a curiosity peeking through when the subject is brought up and a thirst to expand knowledge; but that peeks through only when it is brought up in conversation, rather than arising naturally during consumption of clothing. The curiosity of the consumer and the straightforward nature of this knowledge (it is not a complex matter, in the sense that there's a direct answer to the question of "how" textiles can be recycled, which does not depend on prior knowledge in order to be gathered) should make this knowledge gap easy to close with simple measures such as stating some basic facts, which would hopefully help the consumer to understand and get engaged. There is also reason to believe that it could help the consumer to change their recycling behaviour, seeing as several user study participants state that they do not know where or how to turn in textiles for recycling, and that this is the main reason why they do not do it. The guideline is: expand information on recycling, including instruction and explanation of how it works.

Material properties

The consumer is typically also insecure about material properties in general. This knowledge is relevant to the consumer since the material properties of a garment are directly connected to its use, in terms of how the quality feels, how the garment wears, if it keeps you warm, if it breathes, how it is washed, how it is cared for, and if it is suitable for one's intended area of

⁶ Mental models is a theory originating in cognitive science that can be described as an accurate or inaccurate explanation of how something works projected in a person's mind, often based on the actual knowledge of how something else works. (Jones et al., 2011)

use. All use-related information has the potential to help the consumer to assess whether it can be an informed decision for them to purchase it or not. The study participants appreciate that the material is indicated in the care instructions, and they react positively throughout when asked what they would think of more in-depth information about the properties of the material being indicated in the product information as well.

Indicating material use properties could for example look like elaborating the statement that "the garment is made of 100% lambswool" to "the garment is made of 100% lambswool, which is a natural material that cleanses well by airing and therefore does not need to be washed unless it has a stain". Including what use implications a certain material has relieves the consumer of having to draw their own conclusions, while at the same time educating them and making them better at actually drawing such conclusions about material properties on other products where such have not been indicated. This lands in the guideline: expand material information to include use-related properties.

Generally, the consumer seems to have some knowledge of natural materials and their properties, put high trust in its quality and also that it is recyclable. They seem to have much less knowledge about synthetic materials, have a hard time differentiating between the different synthetic materials and their properties, whether they can be recycled and whether they are a sustainable material. They tend to be perceived as of lower quality than natural materials. Finally, mixed materials, lesser known materials, or materials that are "new" to the market (such as Lyocell fibers), are the hardest for the consumer to draw any conclusions about, and they are prone to assume that they are not recyclable. Meanwhile, the consumer does not seem to appreciate being over-informed on materials that they know well. This lands in the guideline: expand the information about material properties more on "unknown" materials, and less on "known" materials.

The user study points to that finding information about material properties of a garment hinges on the consumer's initiative to search it out. Searching it out, in turn, hinges on the consumer assuming that such information is available at the e-commerce store where the garment was bought, which isn't always the case. This suggests that the information should "search out the consumer" instead of the other way around. This can be achieved to some extent by presenting the material properties in a more visible format.

This concludes the first part of the consumer perspective study focusing on the consumer and their relationship to consumption.

Part two: Information

The second part of the analysis deals with how the consumer relates to product information. The study and analysis deals with product information at large, delving into themes and topics that do not necessarily relate to the message of the design problem. Looking at information at large serves the purpose of understanding the "noise" of information that the consumer is exposed to, in order to be able to design a concept that can break through that noise. The user study suggests that the consumer finds this noise overwhelming, and one of the most stifling factors hindering them from actually reading the information.

The user study suggests that this noise consists of the many types of information represented in product information, the amount of information represented in product information, the lack of standard in content of product information, and the ambiguity of some of the product information, and all this is amplified by the overwhelming amount of products on the market.

In order to not contribute to the noise but rather break through it, the noise is examined in the study alongside the information that according to the user is helpful, and that is appropriate to use for conveying the message.

Garment use cycle

To introduce the topic of product information, it is useful to look at when and where the consumer interacts with a garment. Each garment owned by a consumer passes through a use cycle including certain events. The events represent the consumer's actions in relation to owning a garment. The cycle has three phases: the purchase, the use and the disposal of a garment. Each phase has several event points.

Each point in the use cycle is an opportunity of interaction between consumer and information. Each point represents different needs for information, different levels of interest from the consumer and different mediums where the consumer puts their attention.

Looking at the use cycle of a garment can help finding interaction points that can be used for reaching the consumer with information, using the right medium, answering to the right needs, and using an appropriate format in order to make the communication effective.

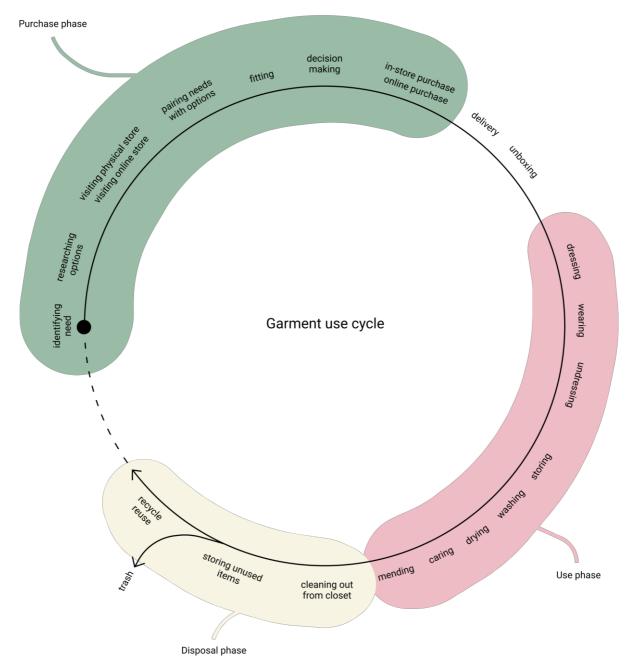


Figure 6. Garment use cycle.

The purchase phase is when the consumer identifies their need for the garment, finds one on the market and decides to buy it. In this phase, the consumer needs information that helps them make an informed decision to purchase. This information should be visible, prioritized and concise. A good channel for this information could be (but is not confined to) the hang tag, because it is where the consumer expects to find information guiding their purchase.

The use phase is when the consumer wears, stores and cares for the garment. In this phase, the consumer needs information that helps them care for, mend and build a relationship to the garment. This information can be hidden but should be easy to find, elaborated and offer an opportunity to find out more. A good channel for this information could be (but is not confined to) the lining of the garment, because it is permanent and this information needs to be available throughout the use and for coming users.

The disposal phase is when the consumer decides that they do not want to use the garment anymore, cleans it out of the closet and either turns it in for reuse or recycling, or throws it in the trash. In this phase, the consumer needs information that helps them turn in the garment to the right level of the waste hierarchy. This information should be hidden but easy to find, instructive and encouraging. A good channel for this information could be (but is not confined to) the care label, because the information is material related and the consumer expects to find any material information there.

Use cases of information

The user study brought up a few *use cases*⁷ of product information, describing when, where and why the consumer would need to use information. They serve as a way to frame the consumer's needs in terms of information. They are explained below and represent different parts of the garment use cycle, providing examples of how the use cycle works. Each example is followed by guidelines.

• Doing research before making a purchase. Research made before a purchase is likely to happen when the consumer is making a bigger investment in a garment, and the drive to do this research varies from consumer to consumer, and is good for making an informed decision. This information is largely sought out online, and the consumer often goes beyond the information that the brand provides when acquiring this information, by looking at options for comparison and third-party reviews. This occurs in the following points in the use cycle: Identifying need, researching options, visiting online or physical store, pairing needs with options and fitting.

The online product information should provide as much information as possible about the garment, in order to help the consumer understand how the garment stands out among the alternatives.

The information should explicitly say how it stands out if there is such information or if there's a "story" behind the garment.

- Determining whether to make the purchase or not. This occurs in-store or online, and is related to the previous use case but not as research oriented; this is more "is this a yes or no given my criteria for an informed purchase?". As previously stated, these criteria vary between consumers and also between driving forces, but what the product information can do for this stage is to be as clear as possible about area of use, material, washability, etc. See "What is an informed decision?" for guidelines, and apply for the in-store or online scenario. This occurs in the "decision making" point in the use cycle.
- Seeking information during use. Information needed during use includes instructions for use and care instructions. These do not need the most visible spot but they do

⁷ Use cases is a tool originating in software development, describing a specific situation in which a product or service could potentially be used (Jacobson et al, 1992). A use case generally includes the following elements: who uses the product (in this case information), what the user wants to do, the user's goal, the steps the user takes to accomplish a particular task, and how the product should respond to an action.

need to be accessible throughout the user journey. One example from the user study was care instructions for a functional outdoor pant, printed in the lining, clearly visible when pulled down at a visit to the restroom. This is a great example of making the information easy to find without disturbing the use or drawing too much attention before it is needed, while still capturing the consumer's attention well at a moment when they have time to focus on it. Seeking information during use occurs in the following points in the use cycle: dressing, wearing, undressing, washing, drying, storing, caring and mending. The guideline that follows is: find a likely use case for the garment, and place instructions for use and care instructions so the consumer finds it while using it.

Furthermore, the product page at the e-commerce should be accessible online even when the product is no longer on the market, specifically so use instructions can be accessed when needed. As a bonus, this indicates to the consumer that it is expected to be used for longer than it is available on the market.

Finally, the product should lead the consumer to the product site, or at least to the brand's general care instructions online, so that the consumer does not have to search it out themselves.

• Seeking information after use. When the consumer no longer desires to use the garment, the information should encourage the consumer to dispose of it correctly. This occurs in the following points in the use cycle: cleaning out from the closet, storing unused items, recycling and reusing.

Information should place a positive expectation on the consumer to return the garment into the waste hierarchy system when it is worn out. The consumer is more likely to do so if they get active encouragement.

The information should guide the consumer practically in how to re-use or recycle it.

The information should explain why it is important and what happens to a recycled garment.

Information about correct disposal should be accessible online. Since the consumer need for this information arises when they are handling the garment, the information should ideally also be found in the garment, but not at the most visible place or disrupting the use.

• *Getting educated*. The final use case of getting information is not related to the garment use cycle. The scenario is watching a documentary, reading an article or looking up a new textile material independent of a certain garment, but for the sake of self-educating, which forms values and informs purchases in the long run. This is a generally appreciated activity by the consumer, while it is their initiative entirely to engage in it. The user study specifically points to the consumer appreciating fashion brands making in-house production of this type of educational material. This also tends to strengthen the consumer's trust for the brand, because it shows the brand's commitment to things beyond selling clothes. This seems to be a powerful tool to 1) educate and 2) specifically influence the consumer's values, in contrast to the above

use cases where information is used to answer questions about the use of a specific garment. Educating and influencing the consumer's values are desirable outcomes of the project and therefore this type of information is worth noting, although the format goes beyond conventional product information.

Information mediums

The user study looked at the *mediums* that are used to transfer product information. This was done in order to understand how the information is received depending on which medium it is transferred through, and if the different strengths of the mediums can be used to the information's advantage. Mediums that transfer information that is not product information but that the consumer uses to get informed, were also evaluated.

• Hang tags are the small tags usually made of paper that sometimes hang in the back of the collar of a garment, but may be attached anywhere on the garment. The hang tag is meant to be removed after purchase, which makes it good for getting through to the consumer, since they have to handle them. The consumer tends to read the information on the hang tag unless it has too many "pages", too many languages or too much irrelevant information.

Hang tags should be concise and filled with highly prioritized information only.

Hang tags can be used to display fresh or temporary information.

Information that is needed in a later scenario than during purchase, should be represented in other mediums than just hang tags.

- Permanent tags in the garment such as the care label need to be designed so that they do not itch or take up too much space, otherwise the consumer might cut it off even though it contains information needed continuously during use.
- The *E-commerce* where the garment is bought tends to be an appreciated information medium. It offers a lot of opportunities for presenting information. The consumer appreciates when the information is expandable and collapsible because of the opportunity to choose freely how much or little information they want to read or even see. Because there is typically more information available than that on printed information, they can get a lot of information without having to sift through lots of noise. The consumer tends to find e-commerce product information pleasant to read because they find it aesthetically pleasing, and that it is easy to get an overview of the garment.

The E-commerce should present all product information that is available around a garment.

- Documentaries and news articles are according to the study appreciated by the consumer because it is third party information, that can inform on a deeper level than product information, and can add nuance to any subject in a way that product information can not. It holds an opportunity to go into detail about a certain aspect of a product or a brand or the industry, that product information does not.
- Social media advertising can, according to the study, create skepticism, and the consumer can find it intrusive. However, in some cases the consumer can appreciate

being informed through this medium, if it for instance leans towards educating instead of marketing, which seems to be perceived as less intrusive; or if the consumer is informed of products that actually suit their needs. This medium and format is not to be confused with social media in general; which the consumer tends to appreciate because of its capacity to inspire.

- Sales advisors in store. Getting verbal information from people who sell and work
 with the products seems to be highly appreciated by the consumer because a skilled
 advisor can tailor the information they give out to what the consumer wants to hear,
 which caters to one of the most central needs the consumer has, which is not having
 to discern for themselves what information they need. They also find it a fun
 experience to talk to somebody about the product as a way of learning, as opposed
 to researching for themselves. If they feel that the sales advisor cares more about
 meeting their needs than selling the product, it is highly appreciated, and conversely,
 it is highly annoying if they feel that they care more about selling the product than
 meeting the consumer's needs.
- The internet. Googling, youtubing and reading reviews give the consumer a sense of getting an objective assessment of the product because it comes from someone who actually used it. This source of information is typically used when the consumer is making a bigger investment of a functional kind, such as a ski jacket. Just like being informed by sales advisors in store, this kind of assessment goes straight to what is interesting to the consumer and how the product serves their intended use. This highlights the fact that use might be a category of information to expand on in the product information.
- Friends, family or influencers making recommendations. Just like looking at reviews on the internet, getting recommendations in person from someone who has used the product gives the consumer a receipt of whether it serves a specific use free from marketing bias. This seems to inform the decision to purchase more than assessing the product through product information, especially if the consumer identifies with the person making the recommendation.

Good and bad information

The user study revealed that some information helps the consumer, while some information makes them confused. This should be taken into consideration when designing product information two ways, which is noise reduction, and that all themes of good and bad information has implications for the consumer's trust in the brand. According to the user study, trust in the brand is key in order for the consumer to engage in the information and let it shape their values, which is why it is important to create trust and avoid creating mistrust.

Ambiguous information

The user study showed that the consumer finds a lot of the current typical product information to be ambiguous or leaving the consumer not knowing what to do with the information, while occupying the consumer's bandwidth to process the rest of the information. Examples of information mentioned in the user study that can be perceived as ambiguous were geographical origin, certifications, fragmentary buzzwords and care instructions. The recurring pattern is that stated but under-explained information creates this negative experience, or when reading the information requires prior knowledge in order to get something out of it. The rule of thumb is that the consumer should never be left with information that they do not know what to do with. The design guideline that follows is that each information attached to the product needs to be evaluated on whether it stands on its own or if it creates new questions. If the answer is the latter, the issuer should consider either removing that information, rephrase it, elaborate on it or give the consumer the opportunity to look it up. This could also benefit from user testing. A second design guideline is therefore to user test the information on consumers and let them determine whether the information is understandable or not.

These are the types of information that the consumer finds ambiguous according to the user study:

- Too simplistic indications of geographical origin. The consumer correctly assumes the garment has more than just one geographical origin, so when the garment has a "made in X" information, this leaves the consumer confused about what the information refers to and what it leaves out.
- Care instructions that deviate from "regular" care instructions. If the consumer for instance buys a cotton T-shirt they might assume that it is washable in 60° celsius. If the care instructions then say it is only washable in 40° celsius, the consumer might not understand why and it is likely that they go ahead and wash it in 60° anyway, unless the reason behind the temperature limit is explained. The consumer might interpret the low temperature limit as the brand's way of protecting themselves at the expense of the consumer's ease of use, which decreases the consumer's trust in the brand, when in reality there might be a material property related reason behind the limit, knowing which might have instead increased the consumer's trust in the brand.
- Care instructions overall, and specifically the symbols, are sometimes found to be hard to read because they require a prior knowledge that the consumer does not always have.
- Performance information that is too vague or seems more like marketing than an actual property of the garment.
- All forms of exaggerated marketing.
- Fragmentary sustainability buzzwords. These are a double-edged sword because they communicate that sustainability has been considered in the production which the consumer appreciates, but can also leave the consumer suspicious of greenwashing unless elaborated on *why* this, for instance, belongs to a "conscious" collection, or even *what* significance it has that it is "recycled" material.
- Certifications. These, too, are a double-edged sword because like buzzwords they reassure the consumer to some extent, but it is generally hard to keep track of what the different certifications say or mean, and the consumer sometimes suspects that certain certifications are too easy to acquire. They tend to not know how to read certifications.
- Sustainability statistics that are not self explanatory (10% less carbon footprint!). Numbers are good because they concretize sustainability work to the consumer, but it is often not concrete enough for the consumer to know what to do with the information.

Information that creates trust

On the other hand, there is information that makes the consumer feel confident in a brand. Even if it is not product information per se, the user study suggests that it has a place in product information because it engages the consumer in both the brand and the garment. The design guideline that follows is therefore to consider putting this kind of information in the product information. These are examples of information that created trust among the user study participants:

- Naming the individual that sewed the garment indicates a production that cares for their workers. Example: a tag in the garment that says "This was assembled by Jane Doe in Åre."
- Transparency; if a brand can take a closer examination from a third party, if they have certifications, if documentaries are made about them, or if they display reviews from users.
- When a brand actively communicates that they have a sustainability analysis.
- When a brand communicates their dedication to something beyond sales. It does not have to be sustainability but could be sports or nature or anything else.
- When a brand shows that they are dedicated to what they claim to be dedicated to, in other ways than through sales and marketing (for example, one brand was mentioned that produces short documentaries about nature and people, without marketing their products in them).
- When a brand is transparent about what they are not good at, or does not claim to be best at everything.
- When the consumers' role models bring up the brand or use their products.
- When a brand issues concrete tools that help the consumers with circular practices.

The theme of the examples is transparency. Transparency in a brand that lets the consumer see the process behind a product, such as in the first example of naming the person who assembled the garment, anchors the consumer in the reality of the production. Assuming that one of the contributing factors to the wear-and-tear mentality that this project strives to change comes from the consumer being detached from this reality, attaching them to this reality could potentially help shape the value that worn materials are valuable resources and not trash. This assumption is enough to add the general guideline: strive to anchor the consumer in the reality of the production, and the design suggestion: consider naming the one who sewed the garment together in the product information, or mention something else about the production on a detailed level.

Information that creates distrust

Conversely, the following - whether represented by information or otherwise - might make the consumer distrust a brand.

- Mass production, carelessly assembled garments indicating bad working environments.
- Exaggerated portraying of the brand as good at everything they do can make the consumer suspicious of greenwashing.
- Exaggerated or intrusive marketing makes the consumer feel forced rather than intrigued to interact with the brand.
- When somebody that the consumer does not trust or look up to recommends the brand or uses their products.

Wanted design

The user study also revealed that the consumer has concrete preferences about the layout design of the information, and that these preferences can be crucial to whether the consumer actually reads the information or not. Most of the following address how readable the information is in terms of Usability or User Experience, which was not worded as such by the participants in the user study, but has been translated into it in this analysis, and some of them address the look and feel of the information.

The consumer wants the following from information design:

- Well prioritized information; that the information follows usability guidelines such as the most important information being highlighted, and the least important information being hidden.
- Relevant information. What constitutes relevant information for the consumer is the burning question of this thesis and is a variable that this analysis is meant to help determine from case to case. To flesh out what is relevant information for each product, it is important to look at the product and its target consumer, understand their driving forces and what is an informed decision for them, as well as using the design guidelines that this analysis produces.
- Information that catches the consumer's attention; that an effort has been made on presentation and packaging; that the information is visually appealing.
- Do not let instructions get overly ambitious or include too many steps.
- Keep the amount of text down.
- Strive to simplify complex content.
- Use images and symbols.
- Do not have several languages represented on printed information. This might be restricted by governmental requirements on the market. If it is not possible to remove translations, re-think placement and prioritization.
- Give the user the possibility to read more.
- Let the information draw more conclusions (as opposed to letting the consumer draw their own conclusions) about aspects of the garment that are relevant for use. Elaborate on basic information. Increase detail of information.
- Keep the amount of physical tags down.
- Let the consumer hear the backstory and thought behind the garment and/or brand, rather than just stating the product name.
- Coherence and continuity in product information. Presenting the same type of information in different garments.

Conclusion

In this user study, the consumer is found to be burdened. The consumer is burdened by an overload of information, by having to sift through an ever growing market in order to find products that suit their needs, but mostly, a consumer burdened by the demand to shop sustainably and to be responsible for creating their own circular behaviours in the jungle of products and information. At the same time, the consumer is found to be very *willing* to shop sustainably.

This study looked at what creates this pattern of unsustainable shopping and sense of burden in the consumer, and found that: a vague demand issued by the society and the fashion industry to do better, to shop sustainably and to be responsible for creating their own circular practices, seems to kill the natural motivation in the consumer to adapt circular practices.

It also found that making informed decisions to purchase products increases the chance that the consumer forms bonds to their products, which triggers the natural motivation in the consumer to apply circular practices. Encourage the consumer to get to know their driving forces, help them to sift through the product and information jungle, and purchase accordingly, and chances are the purchase will be cared for, used for a long time and then passed to another user.

In addition, it was found that concrete instruction tied to positive expectation, knowledge about circular practices, services, return on investment, and good user experience in product information creates a positive experience that engages the consumer in the garment and the information.

In short, catering to the consumer's need for making informed decisions according to their use and driving forces might be more effective in spurring circular practices in consumers, than demanding circular practices per se. The vague duty to be more circular or sustainable kills the motivation, while liking their products drives motivation while also serving their use. In this lies the opportunity to shift the motivation-killing burden from the consumer to the industry. The industry has the knowledge and the tools to help the consumer make choices that trigger circular practices, and this user study gives an indication of how this might be done.

The strategy to design a communication concept then lies in helping the consumer to make informed decisions, combined with increasing the consumer's knowledge of circular practices and materials, offering services and return on investment, and good user experience in product information.

For the specific message of chemically recycled polyester, this means that the information should explain to the consumer how it stands out among its alternatives and teach them about its material properties, while clarifying for the consumer what positive effects it has on the fashion industry when they make this purchase.

Finally, the strategy chosen to communicate is not merely informative, but also enabling. Information takes a passive role in impacting the consumer, while enabling takes an active role. Informing the consumer, regardless of how well-designed the information is, may therefore have to be combined with *helping* the consumer to make informed decisions, *offering* services and return on investment, and so on, in order to impact the values and practices of the consumer. With this insight, the meaning of "communication" is extended in this project to include not only information but also enablement.

The Mistra Future Fashion Outlook Report (2019) confirms this conclusion: "In order to change user behavior a combination of information, individual goal setting, feedback and commitment has the greatest potential to reach a positive change in terms of behavior. Comparing towards a group of users being exposed to only information about the impact of their consumer behavior, which gave 10% positive response, the combination of presented actions gave 60% positive response."

Design guidelines

These guidelines apply to all product information attached to a garment, either physically or online (both unless stated). They could be used by any fashion brand desiring to communicate effectively with their customers via product information. For this project, they advocate for the consumer's needs in order to design a holistic solution that serves them. These guidelines work as a framework for designing a communication concept for any specific message within product information, including that of chemically recycled polyester, but are not specific to it. All guidelines do not have to be fulfilled, but can be viewed as suggestions for improvement.

Aims

- The product information should help the consumer make an informed decision to purchase.
- The product information should stir engagement about the product in order for the consumer to form bonds to it, reducing wear-and-tear mentality.
- The product information should explain to the consumer why it is important and what difference it makes to consume circularily.
- The product information should create trust and reduce distrust by being transparent, easy to read and informative.
- The product information should transfer knowledge to the consumer.
- The product information should strive to anchor the consumer in the reality of the production.
- •

General guidelines

- The information should be as clear as possible, both visually and content wise.
- The information should lean towards being concrete rather than abstract.
- The information should strive to anchor the consumer in the reality of the production.
- The information should search out the consumer instead of the other way around.
- The information should be designed considering the driving forces of the target group, estimating what criteria most likely constitutes an informed decision among them.
- The information should transfer knowledge on recycling.
- The information should transfer knowledge on material properties regarding use, recycling and production.
- The information should reduce information that the consumer finds irrelevant.
- The information should motivate the consumer through educating, encouraging, instructing and offering, and not just informing.
- The information should be well prioritized.
- The use case in which the information is needed in should determine the medium, the prioritization, the accessibility, the level of detail and the level of depth of the information.
- The information should be presented in a visual format that captures the consumer's attention.
- The information should clarify potentially ambiguous information such as origin, certifications, buzzwords and care instructions.
- The information should make sure the consumer is never left with information they do not know what to do with.

• The information should be user tested regarding how understandable and relevant the consumer finds the presented information.

Content guidelines

Guiding informed decisions

- Guidance of informed decisions should be emphasized in the information in the purchase phase of the use cycle.
- If the garment is intended for a specific use that is not self-explanatory, the information should provide a description of this use and instructions if needed.
- The information should explain how the garment stands out, or tell the story behind the garment if there is one.

Use and care instructions

- Instructions for use and care instructions should be placed so the consumer finds them while using it, according to likely use cases of the garment.
- The product site should be accessible online even when the product is no longer on the market, specifically so use and care instructions can be accessed when needed.
- The product should lead the consumer to the product site, or to the brand's general care instructions online, so that the consumer does not have to search it out themselves.

Instructions for disposal

• Information about how to dispose of the garment correctly should be found online as well as permanently in the garment, but not disrupting the use.

Encouraging circular action

- Information that encourages circular action should be emphasized in the information in the use and disposal phases of the use cycle.
- The information should actively encourage the consumer to incorporate circular actions in their use and disposal of the garment.
- The information should communicate a positive expectation on the consumer to incorporate circular actions in their use and disposal of the garment.
- The information should instruct the consumer how to incorporate circular actions in their use and disposal of the garment.
- The information should explain to the consumer how incorporating circular actions makes a difference.
- The information should give the consumer monetary or emotional return on investment for circular action.
- The information should use nudging to spur circular action.

Knowledge expansion

- Knowledge expansion should be included in the information through all phases of the use cycle.
- The information should transfer knowledge on known knowledge gaps among the consumers:
 - Which materials are recyclable.
 - How to turn in textiles for recycling in practice.
 - Whether one's textile waste actually is recycled if it is turned in for recycling.
 - What level of the waste hierarchy the garments end up on at recycling.

- What a garment is turned into when it is recycled.
- What happens in recycling technically.
- What polyester is and that it is a polymer.
- What other properties different materials have; especially synthetic materials, mixed materials or materials that are "new" to the market.
- The knowledge-transferring information should explain why it is important and how it makes a difference.
- The information should explain use-related material properties, not just state the material.
- The information should expand more on the properties of lesser known materials, and not as much on known materials.

Creating trust

- Creating trust should be strived for in the information in the purchase and use phases of the use cycle.
- Transparency should be strived for in the information. Welcome third party examinations and certifications, and display reviews from users.
- Information attached to the product should be evaluated on whether it stands on its own or if it creates more questions. The information should review potentially ambiguous information such as:
 - Whether the indication of origin is too simplistic
 - Care labels with atypical instructions
 - Fragmentary sustainability buzzwords
 - Certifications
- Exaggerated or intrusive marketing should be avoided.
- The brand's sustainability analysis should be actively communicated.
- Dedication to something beyond sales should be communicated, if there is such dedication. It doesn't have to be sustainability but could be sports, nature or anything else.

Format guidelines

- The information should highlight the most important information, and hide the least important information.
- The information should catch the consumer's attention with visually appealing presentation and packaging.
- Instructions should not be overly ambitious or include too many steps.
- Complex content should be simplified but not get a decreased level of detail.
- Images and symbols should be used when appropriate.
- The amount of text should be kept down.
- Placement and prioritization of translations should be thought through if regulations require several languages to be represented on printed information.
- The information should provide the option to expand or read more instead of displaying all information if it is a lot.
- The information should draw conclusions for the consumer about use aspects of the garment.
- The amount of physical tags should be kept down.
- The product information should be coherent and continuous within a product line.

Business perspective

Given that We aRe Spindye is a business-to-business company, they are reliant on their business clients to reach consumers with information. Their business clients are mainly fashion brands, to which WRSD are suppliers of yarns and textiles. These brands decide what information is attached to any product they put on the market, including information about WRSD and their product.

The perspective of these brands on product information is therefore crucial to understand in order for WRSD to communicate effectively to the consumer, and in order to understand how a communication concept would be received and processed by these brands.

One specific aim of the study was to investigate how a process to approach the client brands can be designed, according to one of the objectives of the project. This process would be for WRSD to use each time they collaborate with a client brand, in order to effectively reach the end consumer with their information.

The study was conducted through two interviews. The first interview was with a representative of WRSD about their communication and collaboration with client brands. The second was with a representative of a client brand about their internal processes to produce information.

Branding guidelines

Every client brand that WRSD supplies textiles to has to sign a *branding guidelines* agreement. The branding guidelines is a document stating how information from WRSD should be included in the product information of any product the client brand issues in collaboration with them. When the client brand signs the agreement, they agree to put information about WRSD in their product information. This generally looks like attaching WRSD's own hang tag to the product, or adding the content of the WRSD hangtag in their own hang tag. The guidelines also include fonts, colors and other formats.

Internal processes of client brands

The process of producing product information looks different at every client brand and may even differ between collections. What the process looks like depends on a variety of factors including if the product design drives the marketing or if the marketing drives the product design, if the product information is produced by designers, marketing, communication or someone else, and what departments the final product needs to pass through before it is put on the market. It also depends heavily on "soft" variables such as how busy those departments are at the time when it passes through them, and the quality of the internal communication of the client brand.

Supplier information vs client brand information

Even if a message that is to be communicated through product information is very simple, the information has its own design process that is complex. If the information content of WRSD's hang tag is to be weaved into a client brand's own communication package, conflicts of visual and language expressions can arise. From that perspective it is better to keep supplier and client brand hang tags separate. Furthermore, having a separate hang tag from a supplier reads as more credible. However it is not always the best option to have separate hang tags since too many hang tags in a bundle can look cluttered, creating a "christmas tree effect", such as in the case of highly functional garments with lots of

different textile suppliers. This is a look that likely won't be approved by the marketing department of the client brand, and therefore it is sometimes better to do the work of weaving all information together into one hang tag even if it is difficult.

The complex issue of communication

Deciding what and how to communicate to the end consumer is a question that is always on the table for the client brand. This is because of the the complexity of the environmental impact of the products, the ever evolving knowledge in the industry, what the consumer can or cannot take in, what the brand can or cannot say due to legislation, and that the final information needs to be processed and approved by the production department, the marketing department *and* the supplier in question. In addition, there are sometimes technical barriers to formatting digital information however the brand wants to. Finally, communicating to the consumer is very labor intensive administrative work.

Links between client brand and end consumer

The client brand is not necessarily the only link between WRSD and the end consumer. Their only direct contact with the end consumer is their own e-commerce. In the case of retail, the store employees are a link between the brand and the consumers. In the case of wholesale, there is often an agent and an external retailer between the brand and the consumers. In the case of external retailers, the brand has little to no control over the digital product information and the only way to actually be sure what information goes out to the consumer is to attach it physically to the product, in which case it reaches the consumer upon delivery.

Educating the end consumer

Strategies used to educate the end consumer is to educate internally within the company. The entire company needs to be on board with current information in order to pass it on to the consumer either through the design of the products or through conversation with the consumer in store. The employees get the full information which is often a long read or a lecture, while consumers get it bite-size in the form of hang tags or answers to their specific questions in store. The brands however view it as paramount to offer information to all consumers from the least to the most interested, which means it is important to provide both information that is very easy to digest, and the opportunity to delve deeper.

Conclusion

Abandoning project "communication process"

The most important insight from this study is that the information design process within client brands look different from time to time and from brand to brand. The process depends on manual work and dialogue, and possesses limited opportunity to be automated or streamlined.

Designing a communication process for getting through to the end consumer via the client brand is therefore deemed a futile ambition. From this point on, delivering such a design is no longer included in the project objectives. It is concluded that it was the wrong hypothesis that a process like that would be needed. Instead, the project focuses on the communication concept aimed at the end consumer.

Implications for project "communication concept"

Any communication concept that WRSD wishes to execute via the client brands needs to be sensitive to the fact that the marketing department of the client brand has their own vision of the information. They have the final say, a format of their own, and the power to alter anything they want to. Their concern for the content and expressions of the suppliers' information lies in the fact that they have ultimate accountability of every piece of information that attaches to the product. The information attached shapes the consumer's view of their company.

Being sensitive to this fact likely means that WRSD cannot take too many liberties with any information they wish to attach to the product. It needs to express professionality. A bold message probably needs a discrete visual format, and a bold visual format probably needs a discrete message in order to be approved by the client brand.

This means that WRSD should consider using other mediums of information than those that are dependent on approval from the client brand, to get their message out. The hang tag and other mediums attached to the physical product should still be used, but complemented with other mediums of which WRSD has full control and full opportunity to communicate what and how they want.

Design guidelines

- Be sensitive about the client brand's values when designing information.
- Consider complementing communication through the client brand with other mediums to get full freedom of message and visual expression.

Conclusion of studies

Final problem frame

The three studies reveal three actors who are willing to put effort into making sustainable consumption possible, dependent on each other but struggling to communicate in a way that serves all three actors in the pursuit. We aRe Spindye and the fashion brands sit on knowledge of how the consumer possesses power to change the industry into circularity, but does not fully know how to communicate it in a way that motivates them to use their power. The fashion brands are the intermediators of most of the communication that WRSD or any other supplier reaches the end consumer with, further complicating the matter by adding their own formats and contents to the final message reaching the end consumer through product information.

Opportunities for solutions

Looking at the communication drivers and barriers by studying the three perspectives of the matter lets us draw conclusions of how to communicate more effectively, in the hope that in consequence motivation will arise in consumers to apply more circular practices to their consumption.

The consumer perspective study reveals that consumers get motivation from making informed decisions based on their driving forces, better knowledge of circular economy, recycling and materials, good user experience, services and return on investment. The garment use cycle elicited from the study displays opportunities to provide these things to the consumer through communication.

The message study explains what one needs to know in order to grasp the significance of chemically recycled polyester, but also how the message that WRSD wants to communicate informs the consumer of their power to change the industry, and teaches a way of thinking that helps them use this power.

The business perspective study clarifies what is possible to communicate through the fashion brands, and what should instead be communicated through other mediums.

Implications for design concept

The three studies together suggest a content and a format of this communication. For the specific message of chemically recycled polyester, the studies suggest emphasizing how it stands out among other materials, what its material properties are, including recycling properties, and how it affects the fashion industry if a consumer chooses that material over another. There are many ways to emphasize these points and the guidelines bring up a multitude of suggestions of how to do so in order to reach the end consumer.

However, the three studies together also highlight another important point. Communicating something very complex to the consumer should not be expected to rely on one message in a very concise format. It is convenient to think that the consumer gets everything they need in order to collaborate towards a circular economy with just a catchphrase or a buzzword on a hang tag, but the reality seems to be that they need more than that.

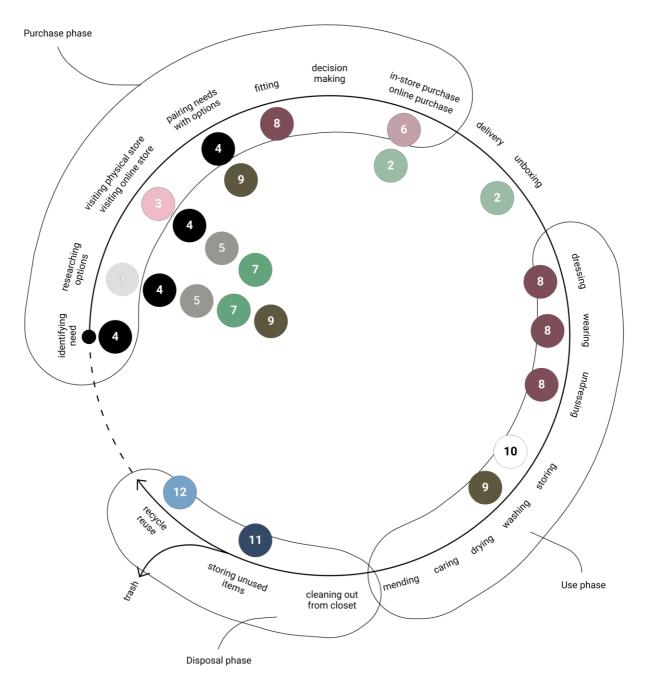
Consider a jigsaw puzzle. Giving someone one piece of a puzzle is virtually useless and would create a sense of "what am I supposed to do with this?" in the recipient. In order to see how that specific piece serves the picture as a whole, they need more puzzle pieces. The only thing they can conclude if they receive one isolated puzzle piece, is that there is probably a puzzle somewhere. (E.g. if a hang tag says "organic cotton" it islike getting a single puzzle piece of the "sustainable production" puzzle. We know that it is important for something; but not necessarily what, what part it plays in sustainable development, or how important it is). It is also very reasonable as a consumer to not know how to proceed in self-educating from this standpoint; it is one thing to put together a puzzle when you were given all pieces. It is another when you get only one piece and have to hunt down the rest of the pieces yourself before you put together the puzzle.

The understanding of circular economy and how a certain part solution (including chemically recycled polyester) serves it requires looking at it from a hundred standpoints and thereby grasping its complexity. The consumer seems, according to the study, to genuinely want to know whether they have made a sustainable purchase, instead of living in the constant uncertainty that is uncomfortable if you care about the environment. For them, it is not enough to conclude that a sustainable purchase has been made because the T-shirt is branded with "organic cotton". And rightly so, because the message study points to that the consumer needs to understand that whether a purchase is sustainable or not does not lie in the net CO2 impact of the specific T-shirt, as much as in what ripple effect you create in the industry by supporting a certain brand. It is not about doing everything right, but about developing a mindset. And a complex mindset is hard to transfer through a single hang tag.

With that said: they should be given the entire puzzle. Or at least, as many pieces needed in order to start seeing a pattern and making qualified guesses about how the picture in its entirety might look.

Chapter 4: Design concept

Design concept





As an answer to WRSD's request, a concept of 12 part solutions were developed. The twelve part solutions convey different parts of the message. All concepts share the same underlying value that worn materials are valuable resources and not trash.

Besides representing different parts of the message, they also represent different points in the use cycle, different mediums, different strategies to get the information across, different levels of detail and elaboration, different target groups, different degrees of implementation, and different degrees of impact.

	Concept	Point in use cycle	Message	Level of detail	Medium	Strategy	Level of understanding
#1	How nerdy are you?	researching options; curiosity spark	CRP; or any technically detailed subject	in-depth	WRSD website	fun, appeals to all levels of interest, triggers interest, UX, storytelling, concretizing, illustrating	all
#2	Kinder hangtag	in-store purchase; unboxing	CRP; or any temporary subject	concise	hangtag	fun, curiosity triggering, attention catching, illustrating, concretizing	build knowledge
£#	Store installation	visiting store	circular economy	concise	store installation	illustrating, concretizing	create awareness
44	Circularity workbook for consumers	identifying needs; visiting store; visiting online store; researching options; pairing needs with options	circular economy; informed decision	in-depth	app or in print	sifting tool	cultivate way of thinking
#2	Garment score app	visiting store; visiting online store; researching options	circular economy	in-depth	app	sifting tool	cultivate way of thinking
9#	Check-out plug-in	online purchase	circular economy	concise	plug-in	fun, shame, illustrating, creating awareness	create awareness
L#	Certification guide	visiting store; visiting online store; researching options	circular economy	in-depth	app or in print	sifting tool	build knowledge
8#	Lining print	fitting; using	CRP; production details; prompts to circular actions	not too short; not too long	garment lining	storytelling, nudging, attention-catching placement	create awareness
6#	Care label redesign	washing; researching options; pairing needs with options	CRP; material use properties	concise	care label on garment	concretizing	build knowledge
#10	Hangers and foams	storing	CRP; material use properties; care instructions; recycling instructions	not too short; not too long	hangers, foams; links to fresh information online	storytelling, attention-catching placement	build knowledge
#11	Waste hierarchy closet storage	storing unused items	waste hierarchy; care instructions; recycling instructions	not too short; not too long	storage box; links to fresh information online	facilitating circular action	cultivate way of thinking
#12	Recycling service	disposal	how to recycle; what happens to my recycled clothes; do the clothes actually get recycled	not too short; not too long	service	knowledge building; return on investment; facilitating circular action	create awareness

Table 4. 12 Concepts.

The big point that this 12-part solution tries to get across, is that a complex message deserves to be looked at from many standpoints instead of just one. This echoes the nature of circular economy which is a way of thinking that we strive to transfer to the consumer. Part solutions seem to be the way of circular economy, and central to the way of thinking that circular economy is. Circular economy does not rely on one solution to fix all problems, but relies on the collaborative effort of many solutions and actors.

The twelve part solutions are each designed to stimulate that mindset. They are fully functional independently of each other, but the point is that they are expected to work best in collaboration with each other.

Features

Message

The concepts convey different aspects of the project's message. The significance of chemically recycled polyester is the specific message of 5 out of 12 concepts. The remaining 7 concepts convey messages including circular economy, material use properties, care instructions, recycling instructions and the waste hierarchy. Several of the concepts are viable to carry other messages but keep the format if preferred. All concepts stand on the value that worn materials are valuable resources and not trash.

Strategies

The part solutions represent different strategies to capture the attention and engage the consumer. One strategy is to use four types of information:

- Educating
- Encouraging
- Instructing
- Offering

Using different types of information allows for more narrow, situation-specific meeting of the consumer's information needs throughout the use cycle. These types of information reach the consumer where they want to be reached according to the user study and guidelines.

There are also strategies to make the information more attractive, accessible and interesting. Most approaches come from the user study and design guidelines, others are derived from concept ideation as means to fulfil needs from the user study or design guidelines. The strategies are:

- Storytelling (Guideline 2.3.3.)
- Illustrating (2.3.37.)
- Facilitating
- Provoking
- Fun
- Sifting (2.1.1.)
- UX (2.2.15)
- Concretizing (Technical/practical detail explained simply) (2.2.2.)
- Return on investment (2.3.13.)
- Nudging (2.3.14.)

The final strategy of the concepts is to design them to give different levels of understanding. Creating awareness regarding a specific topic is the first step of taming the jungle of information for the consumer. Building knowledge is the second step. Cultivating a way of thinking is the final step and what allows you to more successfully tame the jungle.

Use cycle

Each concept caters to a certain point in the use cycle. The point in the use cycle guides what specific message the concept aims to convey and which medium the concept takes, and which level of detail and elaboration.

Assessment bars

Each concept is presented with a set of bars indicating the following:

- **Degree of implementation.** This bar indicates how much time, money, engineering and infrastructural resources it would take to implement the solution, or in other words, how hard it would be to implement it.
- **Potential impact.** Indicating the potential the concept has to impact the consumer's behaviour and, by extension, the environment.
- WRSD business alignment. Indicating how close the concept is to the core of WRSD's business.
- Meeting consumer needs. Indicating how much it would help the consumer if used.
- **Consumer effort.** Indicating how much effort the concept would take for the consumer to use.
- **Timeline of implementation.** Indicating whether it is possible to implement the solution right away or if it is a future endeavor, depending on infrastructure and innovation.

The purpose of the bars is to help to assess whether the concepts are worthwhile, considering that they require very different resources to implement, and considering that some are ready to be developed, while some require an infrastructure that does not yet exist. This is weighed against how much it would help the consumer, what effort it would require from the consumer, and how much impact it could have on the consumer behaviour. The values of the bars are arbitrary and based on estimation, and meant to be used as a tool to compare pros and cons of the concepts.

Developmental stage of the concepts

All twelve concepts are developed to a low resolution, and all need further development in order to be considered a mature concept. The reason for this is that there are twelve concepts instead of one which means that some quality had to be sacrificed in favor of quantity.

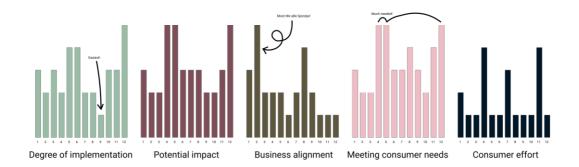


Figure 8. Assessment bars. Which concept is the strongest in each category?

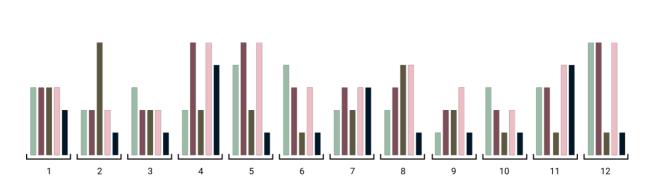


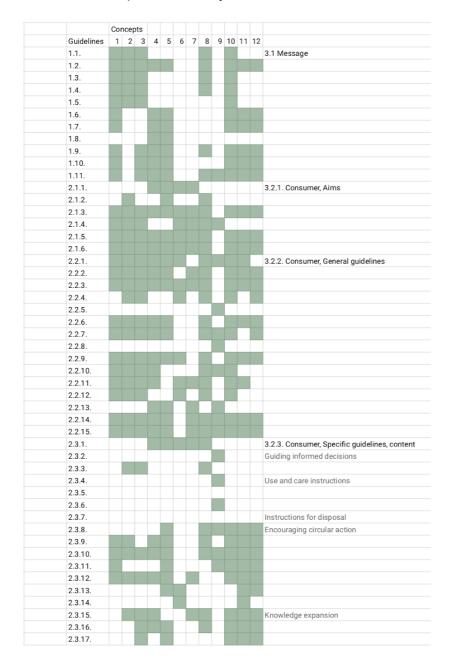
Figure 9. Assessment bars. Which category does each concept perform best in?

We aRe Spindye business alignment

For the benefit of diversity, all part solutions are not specifically tailored to suit WRSD's business concept. WRSD has the freedom to act on every part solution they want to, aware that some are not part of their niche but recognizing that communicating a complex message might require going beyond their niche.

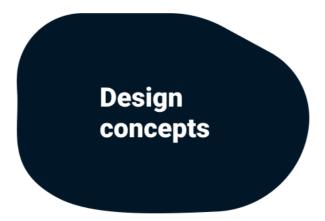
Use of guidelines

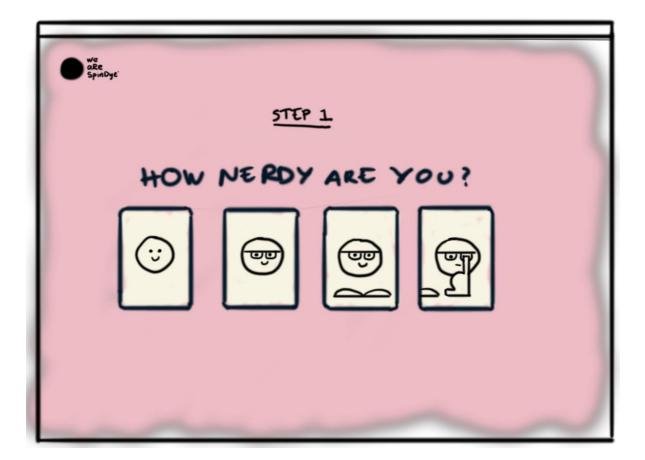
The guidelines have been used when designing the concepts according to the figure below. The green boxes represent which guidelines the different concepts fulfil, or have the potential to fulfil if fully developed. The concepts and guidelines are numbered, and a list of numbered guidelines can be found in the appendix. The matrix is however mostly there to illustrate the spread of used guidelines across the concepts, as a way to further motivate the use of 12 concepts instead of just one.



	_		_	
2.3.18.				
2.3.19.				
2.3.20.				
2.3.21.				
2.3.22.				
2.3.23.				
2.3.24.				
2.3.25.				
2.3.26.				
2.3.27.			Creating	trust
2.3.28.				
2.3.29.				
2.3.30.				
2.3.31.				
2.3.32.				
2.3.33.				
2.3.34.				
2.3.35.				
2.3.36.			3.2.3. Co	nsumer, Specific guidelines, format
2.3.37.				
2.3.38.				
2.3.39.				
2.3.40.				
2.3.41.				
2.3.42.				
2.3.43.				
2.3.44.				
2.3.45.				
2.3.46.				
3.1.			3.3. Busi	ness
3.2.				

Table 5. Guidelines matrix.





DEGREE OF IMPLEMENTATION	
POTENTIAL IMPACT	
WRSD BUSINESS ALIGNMENT	
MEETING CONSUMER NEEDS	
CONSUMER EFFORT	
TIMELINE OF IMPLEMENTATION :	POSSIBLE NOW

Concept 1. How nerdy are you?

How nerdy are you?

What

A consumer tool to understand chemically recycled polyester, in the form of detailed information on the landing page of WRSD's own website. The consumer gets to choose at which level of detail they want to read the information, by choosing "how nerdy they are".

Why

Building knowledge by making it accessible at different levels of interest and commitment.

One part-solution in order to convey the message of chemically recycled polyester and what benefits there are compared to virgin and rPET polyester, is simply making all the information available on the platform that WRSD already has at their disposal which is their website. The concept caters to several types of consumers, by making the information accessible for all levels of interest and commitment. Presenting the information at four different levels of technical detail and complexity, gives the mildly interested the opportunity to get a quick overview of the matter, while still being introduced to the suggestion that there's more to the topic. This should reduce the confusion that arises among consumers when a statement in product information is too simplistic, that awakens the instinct that there must be more to this and the following frustration of not knowing how to research it - while still not forcing the consumer to read an essay unless they want to. It also gives the highly interested the opportunity to dig deep into the matter right away, without having to do the research on their own.

The headline is intentionally provocative, "nerdy" being a somewhat negatively charged term, juxtaposed against the implication that the higher level of nerdiness, the better. This is supposed to provoke the consumer into wanting to know more, challenging them to go beyond their usual level of engagement.

The information presented caters to the conflicting consumer needs for easily digested information and for greater level of technical detail, and lets them engage at the level that suits them. It has the opportunity to utilize illustration, concretization, storytelling and UX in order to convey a difficult message. The information should be highly visual, either in the form of illustrations or video, while the higher levels of "nerdiness" may contain more dense sections of text.

WRSD should lead consumers to this tool by 1) putting a link or QR code on their hangtags and 2) spreading it on social media.

R SpinDye' inDye CLEAN COLORS CLEAN COLORS We alte SpinDye® is really going We affe SpinDye® is really going the extra mile with this product: the extra mile with this product. The use of water and chemicals is The use of water and chemicals is significantly reduced, which significantly reduced, which means less energy consumption means less energy consumption and a smaller carbon tootprint. and a smaller carbon footprint. The fabrics are given extra ordinery The fabrics are given extra ordinary performance for color fastness to aun performance for color fastness to sun light and wash. The performance light and wash. The performance metrics are 100% transparent. metrica are 100% transparent. WWW.SPINDYE.COM WWW.SPINDYE.COM WE NOW USE BECAVSE ... RECYCLED POLYESTER BUT WHY DO NE DO THAT? FUTURE HIMRY PRESENT DEGREE OF IMPLEMENTATION POTENTIAL IMPACT WRSD BUSINESS ALIGNMENT MEETING CONSUMER NEEDS CONSUMER EFFORT

TIMELINE OF IMPLEMENTATION : POSSIBLE NOW

Concept 2. Kinder hang tag.

Kinder hang tag

What

Adding a section to the WRSD hang tag, that opens when you pull it. The section contains a specimen of the three different raw materials behind virgin, rPET and chemically recycled polyester, with a short description of each on the inside of the section. Why Creating awareness by concretizing and sparking curiosity.

Heavily reliant on the strategy of concretizing, the concept lets the consumer feel and see the raw materials behind the three raw materials that you can make polyester of. A short text explains the pros and cons behind each raw material, which they are hopefully curious to read as the three small specimens fall out in their hand, making the information less abstract as they can tie the information to what they see and feel. The concept grabs the attention and curiosity of the consumer because it is a parcel for the consumer to open.



Concept 3. Store installation.

Store installation

What

An art installation in-store, depicting second hand clothes going into one machine, and PET bottles going into another, and out of both come the garments that are sold in the store. An add-on to a clothing rack. Why

Creating awareness by illustrating and concretizing.

A rather large installation in-store in the form of an artwork is a way of grabbing the attention of the consumer. Over-visualizing a simplified version of the processes of recycling old clothing and pet bottles respectively, makes it clear to the consumer that it is possible to get recycled polyester two ways. With the two types of recycling sitting at each end of a clothing rack, a space between them appears which is perfect for explaining the installation in more detail. This explanation should include a simple comparison between the two types, including use aspects such as fiber quality and recyclability, as well as how they each affect the circularity of the fashion industry. The explanation could be neutral, letting the consumer draw their own conclusion about which one is best, or it could be pro-chemically recycled polyester, as a way of promoting the material. The clothing rack should of course be populated by garments made from these materials.

DEGREE OF IMPLEMENTATION	
POTENTIAL IMPACT	
WRSD BUSINESS ALIGNMENT	
MEETING CONSUMER NEEDS	
CONSUMER EFFORT	
TIMELINE OF IMPLEMENTATION :	POSSIBLE NOW

Circularity workbook for consumers

What

A workbook that guides the consumer through a number of questions in order to help them assess the environmental impact of a purchase. Can be in print or in app.

Why

Helping the consumer to make circular choices through providing a tool.

Directly inspired by the Nike Circularity Workbook (2019) that helps fashion brands think circularily when designing and producing garments, the circularity workbook for consumers helps the consumer to find cues pointing towards a garment's environmental friendliness or lack thereof, by asking questions regarding the brand, the transparency of the brand, any buzzwords, production sites, material content and so on.

This concept helps the consumer to think for themselves, draw their own conclusions, and cultivate a way of thinking, while helping them identify what to look for in order to draw those conclusions. It shifts the focus from relying on fragmentary buzzwords to actual analysis, thereby teaching the consumer how not to fall for greenwashing.



Concept 4. Circularity workbook for consumers.

The workbook will point a lot of attention to the brand rather than the garment, in order to make the consumer understand that their choice of brand has way more ripple effect on the fashion industry and therefore environmental impact, than any environmental net-impact of the garment per se.

The workbook will also include questions to help the consumer assess whether it is an informed decision for them personally to make the purchase.

DEGREE OF IMPLEMENTATION	
POTENTIAL IMPACT	
WRSD BUSINESS ALIGNMENT	
MEETING CONSUMER NEEDS	
CONSUMER EFFORT	
TIMELINE OF IMPLEMENTATION:	POSSIBLE NOW

Garment score app

What

An app in which you fill out a few values about a certain garment that you are about to buy, which performs a simplified LCA analysis, and generates an arbitrary LCA score.

Why

Helping to assess the environmental impact of a garment through providing a tool.

An app that gives a sustainability score to a purchase creates awareness in the consumer that their purchase has an environmental cost in addition to a financial one. The values that the consumer fills in educates them on which variables matter to the environment. A score from 1-100, the higher score the better, helps them compare options and reflect upon purchases, and could possibly stop or delay a purchase for a time, giving the consumer the opportunity to re-evaluate whether they should buy it or not, increasing the chance that the purchase is being based on an informed decision.

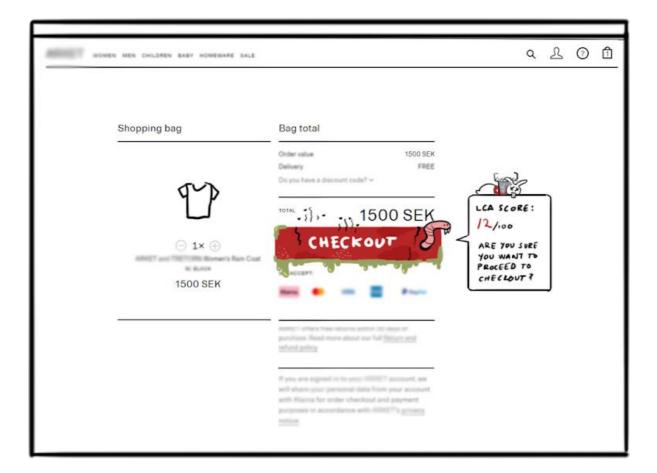
Purchased items could then be saved in the app, and additional data could be filled in over time, such as how often the garment is being used, which would lower the LCA score and give the consumer some emotional return on investment. The concept could be developed even further to full gamification of being circular in the use of a garment.



Concept 5. Garment score app.

In order to make this possible, there would have to be considerable work done on how to make the LCA analysis accessible to laymen. What is needed in order to make this accessible is, by selection: 1) a way to convert the LCA analysis into a numerical score, 2) an artificial intelligence that can approximate data that is not made public, based on similar real data, and 3) pre-defined scopes and goals of the analysis suited for textile products. In addition, it would have to clarify to the consumer that the result is highly arbitrary, and the term LCA should probably not be used in the name of the app even though it is based on the method.

DEGREE OF IMPLEMENTATION	
POTENTIAL IMPACT	
WRSD BUSINESS ALIGNMENT	
MEETING CONSUMER NEEDS	
CONSUMER EFFORT	
TIMELINE OF IMPLEMENTATION:	NEAR FUTURE



DEGREE OF IMPLEMENTATION	
POTENTIAL IMPACT	
WRSD BUSINESS ALIGNMENT	
MEETING CONSUMER NEEDS	
CONSUMER EFFORT	
TIMELINE OF IMPLEMENTATION:	NEAR FUTURE

Concept 6. Check-out plug-in.

Check-out plug-in

What

A plug-in to browsers that lets the checkout button at e-commerce stores reflect the arbitrary LCA score with comical, colorful effects.

Why

Reminding users of environmental cost before purchase through humor.

This concept catches the attention of the consumer by changing the "check-out" button at ecommerce stores into colors and themes reflecting the LCA score of the purchase. A low LCA score could generate a check-out button that is green and has happy bunnies on it, while a high score could generate a black check-out button with red monsters eating bunnies. The button should also display the numerical LCA score, as well as an explanation to the score. This reminds the consumer of the environmental cost at the crucial point of making a purchase, hopefully stopping them to reflect before continuing with the purchase.

The concept could have a shaming effect, which is why it is important that it has a humoristic touch. Adding to the consumer's burden is not a sustainable strategy, so this concept should be viewed with a pinch of salt. The consumer needs to not be weighed down with burdens to make good decisions; adding laughter to the insight that they are about to make a less than good choice might reduce the risk of weighing them down, while still educating them on what might be a bad choice.

This concept, just like the previous one, relies on developing a way to automate LCA scores. This would require brands sharing public LCA data as a rule, and artificial intelligence. It is a high degree of innovation which means it will take a lot of resources to implement. However, developing a way to automate LCA scores in the future could have lots of areas of use within this field.

This concept might not be possible at present, depending on whether it is built as an add-on to the LCA score app or as a browser plug-in concept standing for itself.

Certification guide

What

A guide to the most important and/or most common certifications within fashion that helps consumers to interpret them.

Why

Helping to interpret certifications through providing a tool.

Much like the circularity workbook or the LCA Score app, the certification guide is something to pick up as one is about to make a purchase and wants to make a good assessment of whether the purchase is sustainable or not. The guide should function as a catalogue of certifications with images of each certification badge, and clear explanations of what criteria a brand or a material needs to meet in order to get the certification. Ideally, the guide should also lead the consumer in how to interpret the information of a certification. For example, it could include information like whether the certification is basic or hard to achieve. If the certification is basic, the guide could say "This is a basic certification for X. Avoid



Concept 7. Certification guide.

buying X garments if it is not certified, because it likely means the brand does not meet basic requirements for X." Likewise, if the certification is advanced, the guide could say "This is an advanced certification for Y. If you buy a Y garment, it is likely the most sustainable option you can find within Y."

Giving the consumer access to and understanding of how to interpret certifications could increase and nuance the consumer's view of sustainability. It would give them a concrete tool to tackle the questions that arise when met with a certification. Lastly, it could create awareness of certifications and sustainability issues within the fashion industry, that could lead to the consumer demanding higher standards from the industry by picking options that are certified.

DEGREE OF IMPLEMENTATION	
POTENTIAL IMPACT	
WRSD BUSINESS ALIGNMENT	
MEETING CONSUMER NEEDS	
CONSUMER EFFORT	
TIMELINE OF IMPLEMENTATION :	POSSIBLE NOW



"This garment has been worn before. Before it was a jacket, it was a school uniform in [Town], China. Instead of incarcerating the uniform or letting it waste away at a landfill, it was recycled and made into new polyester fabric. Since it is chemically recycled, the fibers are restored to their original quality. So it's been worn before - but the quality is brand new.

Unlike recycled PET bottles, which have to be recycled mechanically. Recycling mechanically breaks the fibres and reduces the quality ever so slightly. A garment made of recycled PET bottles has therefore never been worn before, yet the quality is not quite as new.

The more worn garments that are turned in for recycling, the better the recycling will get. Please turn this garment in for recycling when it is worn out. Every garment deserves a new life after serving faithfully until it breaks."

DEGREE OF IMPLEMENTATION	
POTENTIAL IMPACT	
WRSD BUSINESS ALIGNMENT	
MEETING CONSUMER NEEDS	
CONSUMER EFFORT	
TIMELINE OF IMPLEMENTATION :	POSSIBLE NOW

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Concept 8. Lining print.
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What

A print in the lining of the garment, visible at fitting or dressing.

Why

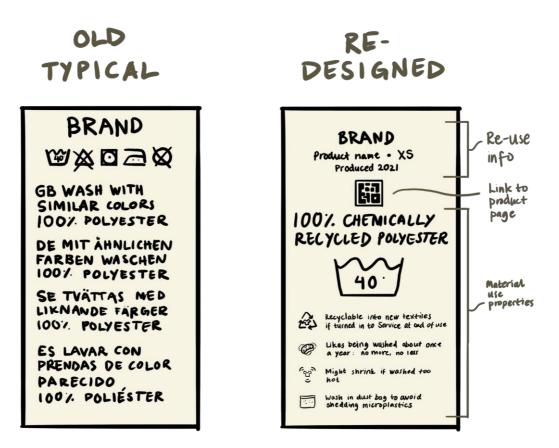
Creating awareness through storytelling and attention-catching.

Placing visually pleasing information on the inside of a garment catches attention and adds a sense of luxury to the garment. The information and the sense of luxury both carry the potential to raise the perceived value of the garment, increasing the potential of the garment being used for longer.

The message should in this case center around chemically recycled polyester, but in storytelling form rather than technical detail, since the aim is creating awareness and forming bonds rather than building knowledge.

This message conveys transparency, the value of resources, awareness of chemically recycled polyester contra mechanically recycled polyester and encouragement to recycle. It also adds an element of luxury to the garment without demanding lots of extra resources.

Aside from the print in the lining, the message should be repeated in the hang tag for emphasis and for greater spread. The hang tag version should be in short form, including just the last two phrases: "Please turn this garment in for recycling when it is worn out. Every garment deserves a new life after serving faithfully until it breaks."



DEGREE OF IMPLEMENTATION	
POTENTIAL IMPACT	
WRSD BUSINESS ALIGNMENT	
MEETING CONSUMER NEEDS	
CONSUMER EFFORT	
TIMELINE OF IMPLEMENTATION :	POSSIBLE NOW

Concept 9. Care label redesign.

Care label redesign

What

Redesign of the care label that includes material properties.

Why

Building knowledge and driving practices by adding user experience to care labels.

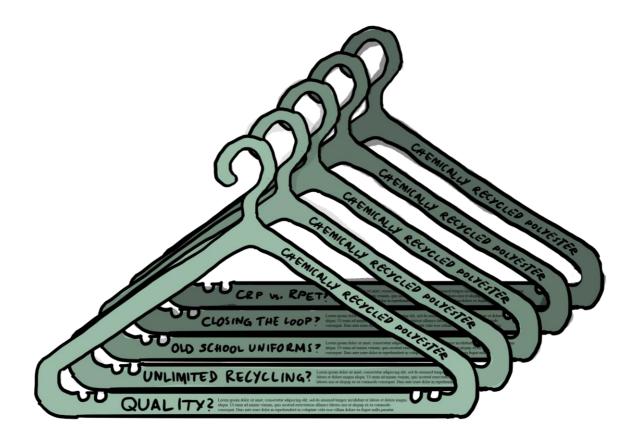
The redesign of the care label features two main sections. In the first, the product is defined by brand, product name, size and year of production. This information is helpful for future reuse of the garment, and is often requested upon selling the garment second hand. The second section consists of material use properties of the garment, beginning with stating the material, followed by wash temperature, followed by material related use instructions such as recyclability, if it shrinks, how often it is ideally washed and so on. The two sections should be the first page of the care label, in one language only. Elaborated wash instructions that are not as common as washing temperature as well as translations should be on the following pages.

These use properties should be determined by the designers of the garment, assuming the designers have chosen the material in order to serve the use of the garment. This would connect the designer's idea of use with the actual use, possibly prolonging the life of the garment, while also educating the consumer about material properties.

The care label could also include any type of explanation behind a material choice that is not necessarily use related properties. For instance, such as in mixed material textiles, the care label can say "60% organic cotton, 40% chemically recycled polyester - mixing in some polyester into a cotton shirt lowers the water consumption in the production of the shirt".

The two information sections are separated by a QR code which leads the consumer to the product webpage, where they can find extended information, ideally even when the product is no longer being sold.

The content of care labels is regulated by the EU for any textile products sold within the EU, and so these regulations need to be followed in a redesign. One regulation states that the type of fibre that the garment consists of is to be printed in the languages of all the countries within the EU that the garment is being sold to (Regulation no 1007/2011 of the European Parliament and of the Council). This often leads to a long list of translations that demands the font size to be very small and makes the text hard to read. One way of redesigning this while still maintaining the regulations of the EU is to make the front page of the care label include only one language (preferably English in the EU), and the following pages can contain the translations. Since the inclusion of material use properties is not regulated by the EU, the following translations need not include these.



DEGREE OF IMPLEMENTATION	
POTENTIAL IMPACT	
WRSD BUSINESS ALIGNMENT	
MEETING CONSUMER NEEDS	
CONSUMER EFFORT	
TIMELINE OF IMPLEMENTATION:	POSSIBLE NOW

Concept 10. Hangers and foams.

Hangers and foams

What

A collection of hangers and foams with visible information printed on them.

Why

Building knowledge by storytelling and attention-catching placement.

A collection of closet furnishing - hangers and folding foams - each displaying different, bitesize information about any aspect of the message of the project. For instance, one collection (a handful of hangers or a handful of foams) could display different facts about CRP, such as its quality compared to rPET, the fact that it can be recycled an unlimited amount of times, the fact that it is made from old chinese school uniforms, and the fact that it helps closing the material loop in the fashion industry. Other themes that the hangers and foams could be suitable for displaying could be for instance material use properties; one collection of hangers and foams could cover the use properties of synthetic materials, one could cover the natural materials, one could cover materials that are new to the market, and so on. The concept is appropriate for any type of information that can be given in several small portions, or information themes.

Placing the information in the closet on tools that are handled daily but that no one expects to find information on, creates a surprise that draws the attention to it, with a high level of exposure. This requires very low effort from the consumer while actually finding its way to their attention.

This concept also has a unique opportunity to convey a message in several small parts, or several small messages. The short format can incline the consumer to read it, but without mutilating the message by not giving enough context. The concept is also appropriate for storytelling if the theme of the message is best conveyed in such a format.

There is also an opportunity to pair this concept with the strategy of an offer. A set of hangers and/or foams could be gifted as you buy a certain garment. For instance, as the consumer buys a garment made from CRP, they could get CRP informing foams for free. Printing the information on functional items that the consumer has an incentive to use with the product that they just bought, should decrease the risk that they dismiss the information like they could have if they received printed information on paper.

Waste hierarchy closet storage

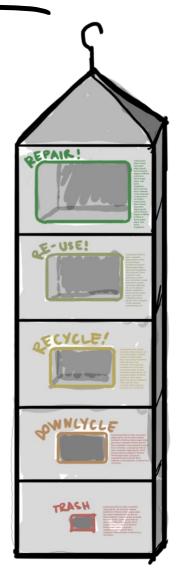
What

A piece of furniture that stores unused clothes after they are cleaned out of the closet, and before they are disposed of. Why Helping to waste properly through providing a practical solution for storing.

A piece of furniture designed to hang in a closet or any storage space. The furniture piece has compartments representing the levels of the waste hierarchy. Each level provides tips on how to upgrade a used garment to a higher level of the hierarchy. The piece is designed with a nudge to make the lowest level the hardest to put used garments in, which creates an incentive to try to upgrade the garment before disposing of it.

The piece should be compressible, in order not to take up unnecessary space if not populated. The different compartments should be detachable, because the garments of the different levels of the waste hierarchy are usually turned in to different collectors, and the consumer needs to be able to bring one at a time.

Each level is equipped with information about the corresponding level of the waste hierarchy and what happens if the garments are turned to a certain level. The information should be semielaborated, and provide opportunity to read more, up-to-date information, via QR code.



Concept 11. Waste hierarchy closet storage.



Recycling service

What

A service that collects used garments and turns them in for recycling.

Why

Facilitating recycling and building knowledge through providing a service and educating.

An upgrade to the already existing recycling services, like containers in local neighborhoods, and turning in textiles for recycling at certain fashion retailers.

This service would come and collect worn out garments from the consumer's home, and turn them into a facility that sorts textiles for recycling. This way, the consumer would get rid of textiles taking up space in their home, not having to figure out where they can turn in their textiles, not having to do the actual chore of turning them in, and getting some answers to the question of "will these actually get recycled into new clothing if I turn them in?".

Besides solving several of the practical obstacles hindering consumers from recycling today, the most important feature of the service is the follow-up. The recycling will be connected to the consumer's e-mail account, and the consumer will be able to track what happens to the recycled clothing, just like parcel tracking but in reverse. Every time the turned-in clothing reaches a new point in the recycled garments: reaching the facility where it is sorted, the batch in which it came from being sorted, the fraction of that batch that goes to recycling reaching the recycling facility, and the recycled product being sold to a fashion company. This e-mail would disclose information such as what percentage of the batch of garments went to the different levels of the waste hierarchy, where the recycled fraction is located, what the recycled product is, and to what company the recycled products are being sold to.

This would engage the consumer in the recycling process and educate them on what actually happens with recycled clothing. The service would also have to be very clear on what you can and cannot recycle, which would also create an incentive - or kill an obstacle - to gathering worn garments for recycling. It would also add transparency to the recycling industry.

Most importantly, this service aims to stimulate the recycling industry. The service would be part of the infrastructure that this industry needs, by making sure that there is enough raw material available to invest in facilities that can recycle them.

Ideally, in order not to put extra weight on the shoulders of the environment, the service would collaborate with delivery services, meaning that the clothes are picked up as you get something else delivered.



Chapter 5: Discussion

RQ 1: How can a communication concept be designed that fuels circular values and practices in consumption among consumers?

The informative perspective

The project initially took an informative perspective on communication, the reason for this being that product information on a hang tag is WRSD's current way of communicating with the consumer. This made for a reasonable starting point for investigation although the communication concept could take whatever format that was found suitable according to the study. Communication was mostly discussed in terms of information in both the consumer perspective and the business perspective study. However, informing the consumer per se is not the end goal of the information in this project; changing behaviour is. This begs the question, is the informative perspective on communication suitable for that purpose?

When discussing drivers and barriers for circular practices, the consumer perspective study did reveal strict information needs such as the need for knowledge of recycling and materials, the lack of which being pointed to as a concrete barrier for the practice of recycling. However, the needs that came up most frequently were not of an informative kind, but rather of an enabling kind; the need for smooth turning in of textiles to recycling, the need for equipment in order to be able to repair damaged garments, the need to not take up too much physical storage space while storing garments that are no longer wanted; and so on. This kind of need must be met with practical solutions that erase the barriers; it cannot be met by mere information. At best, information can motivate the consumer to do those practices in spite of the barriers; but it still does not erase the barriers, which means the root need is not met even if it makes the consumer perform the practice for some time. According to the user study, this time will not be long: motivating without enabling seems to lead to a sense in the consumer that they are not doing enough, which ultimately leads to even less motivation than they initially had.

Another way to put it is that the barriers and drivers for circular practices are sprinkled across the entire use cycle. Looking at the three barriers mentioned in the section above, they represent three different points in the use cycle (mending; storing unused items; reuse or recycle). The point of the use cycle is to provide a tool for having a consumer-centered approach to communication, and what it illustrates is that the consumer has different needs in different stages of the cycle. In this case, when discussing barriers and drivers for circular values and practices, the use cycle suggests that helping the consumer to conquer barriers looks like not only providing information but also enabling them.

The enabling perspective

An enabling perspective could be defined as communication that does more than just inform the consumer of a certain thing. For instance, it could be communication that helps the consumer make an informed decision, helps the consumer interpret information, or provides a service. An informative perspective could be seen as passive communication (there is no call to action), while an enabling perspective could be seen as active communication (there is a call to action).

An example of how an enabling perspective could be accomplished is through designing a service. For instance, a service that gathers and recycles old garments would enable the consumer to easily recycle their worn garments, which means that the root need is being met. Furthermore, it can be seen as a means of communication. This particular example communicates to the consumer that there are monetary incentives for companies to collect

what has been disqualified from the consumer's use; which by extension communicates that there is monetary value in old garments even if they are worn out or broken. Although the monetary value is not necessarily the most important value a worn out garment holds from this project's perspective, it is a value that is relatable and tangible to the consumer, and therefore it has the potential to transmit to the consumer the idea that old garments hold value. This is the value that WRSD wants to spread. This example suggests that an enabling take on communication can both enable practices and transmit values.

On the note of transmitting values

Ideally, the consumer would understand the inherent, material value that the garment possesses regardless of condition, because of the environmental cost of extracting its material from nature, the environmental cost of disposing of it, as well as the potential to regain its original quality upon recycling. The consumer perspective study however points to the consumer being largely un-anchored in the reality of these costs, because they lack knowledge about the processes of production, disposal and recycling, as well as ability to envision them, leading to a lack of ability to perceive their true cost and who pays that cost. The consumer might have a hard time perceiving the material value because they cannot envision something broken becoming a new, qualitative product. The monetary value, on the other hand, is relatable to the consumer because they paid for the garment, which makes it an accessible analogy to communicate the garment's value to the consumer. For the purpose of equipping the consumer of the sense that a garment has value as guickly as possible, using the monetary value could be of service. In the long run, however, it would benefit the circular economy if the consumer valued the garment according to its actual cost which includes an environmental cost as well as a social cost. This is where information per se could be an appropriate strategy to approach the consumer; equipping the consumer with this knowledge and anchoring them in the realities of production and recycling is a knowledge need, which could be met by mere information and thereby potentially transmit these values. The user study suggests that the consumer would appreciate to get this knowledge gap filled.

In conclusion

The user study points to mere information in and of itself having limited power to change the individual consumer's behaviours or practices of consumption. Mere information has its place in communication, especially in transferring knowledge, but needs to be complemented with an enabling approach, in order to fuel circular practices. The Mistra Future Fashion Outlook Report (2019) confirms the conclusion: "In order to change user behavior a combination of information, individual goal setting, feedback and commitment has the greatest potential to reach a positive change in terms of behavior." Of the four suggested ways, one is informative/passive, and three are enabling/active. An enabling perspective encompasses a wider variety of design strategies than information, while not excluding information as a strategy to affect the consumer. As a result, the final concept turned into a mix of informative and enabling communication concepts.

RQ2: What are the drivers and barriers of communication between the three stakeholder groups, and what implications do they have for communication of the specific message of chemically recycled polyester?

The studies reveal that the drivers for communication for the consumer are: good user experience, information that is affirmative of the consumer's driving forces and needs, attention-catching formats, specific instruction and concrete knowledge. Barriers for communication for the consumer are: ambiguous information, distrust in brands and overwhelming amounts of information. For WRSD and their business clients, the drivers for communication are branding guidelines, and the barriers are malfunctioning internal communication and the the marketing department of fashion brands' disapproval of information from suppliers.

What these drivers and barriers between the three stakeholder groups imply for communicating the message of chemically recycled polyester is simply: implement the drivers and eradicate the barriers in communication.

However, there are more drivers and barriers that have implications for the communication of the specific message of chemically recycled polyester, than just those that go between the three stakeholder groups. As established in the message study, understanding the context in which chemically recycled polyester works for the circular economy seems to be a driver for going beyond just raising awareness of the material. If WRSD only wanted to raise awareness of chemically recycled polyester, they could have simply added this information onto their hangtag. However, the original problem frame of this design project states that they want to really communicate the breakthrough of chemically recycled polyester, which implies that they want the consumer to have a reaction to the message beyond just registering it. The message study concludes that this requires that the consumer understands the context that chemically recycled polyester operates in. Since the consumer perspective study states that the consumer lacks knowledge, or context, this is something that has to be given to the consumer for the message of chemically recycled polyester to be properly communicated. The consumer perspective study points to using mere information, conveyed through concretizing, illustrating, encouraging, good user experience, educating and nudging as a good strategy of providing context.

The instruction from WRSD clearly states that they want the communication to go beyond creating awareness. As stated in the design concept section, excelling beyond creating awareness in communication, means aiming for building knowledge and finally cultivating a way of thinking. Although this 3-step rocket is a model for how the consumer learns and matures in their thinking that is an observation of this project, and not WRSD instructions, it is useful to consider when figuring out how to communicate to the consumer. The second step, being building knowledge, further motivates the strategy to provide context to the message. It i also implied that cultivating a way of thinking is something that WRSD wishes for the communication concept to achieve, freely translated from their wish to drive values and practices. As established earlier in the discussion, driving values and practices requires a combination of information and enablement in communication.

In conclusion, communicating the specific message of chemically recycled polyester requires implementing the drivers and eradicating the barriers of communication between the three stakeholder groups, and for communicating beyond just creating awareness, context should be provided, and a mixture of informative and enabling communication

should be used. The consumers need to be communicated to in a manner that lets them take one step at a time in the 3-step learning rocket, which means communication is needed at all three levels.

Method

The project is heavily marked by the systems thinking approach that has been used. The systems thinking approach is characterized by a wide variety of topics being touched but not deep dived into, which results in a project that can be perceived as broad and complex. The instruction from WRSD was to communicate in a way that both informs, shapes values and drives practices. It quickly became evident that fulfilling all three objectives requires understanding how the entire system of consumption and circular economy affects the consumer - and vice versa - and identifying what role communication plays in that.

In addition, an explorative perspective on the project was needed because it seemed to be a fairly unexplored area of research. This resulted in "open" interviews, in the sense that they were held with no specific target outcome, but rather welcoming any thought that seemed to contribute to the understanding of the consumer's relationship to consumption and communication, even if it was "off topic" according to the interview guide. This led to very long interviews, which limited the amount of interviews in the studies. The small amount of interviews compromises with the generalizability of the study, and the findings should be viewed as an attempt to understand a system and a suggestion of how it *might* work, aware of the amount of subjects in the findings needing further research before any claims of how it *does* work can be made.

Finally, the systems perspective led to the final design of a 12-part concept of which several can be considered to be outside of WRSD's niche. For instance, a redesign of the hang tag or publishing information on the website could be considered within niche, while producing an in-store installation or launching a service could be considered out of niche. It would take a great effort for WRSD to produce such a design if they decided to take on the challenge instead of sourcing it to someone for whom the concept would fall within niche.

The brief touching on topics, the small sample of interviews, the concepts that fall out of niche and the overall broadness of the project were all drawbacks for the benefit of the systems view of the project, which raises the question: was it a good approach to take?

I have found the systems view being a necessity of the project, as well as a great gain. Research indicates that a systems perspective on circular economy is a necessity in order to not fail to include aspects that need to be looked at lest the effort of looking at one aspect is nullified. Lisa Keßler et al concludes the necessity in their 2021 paper "The contribution of material circularity to sustainability - Recycling and reuse of textiles":

[Circular economy] has a selective relation to sustainability and can assist in achieving sustainability, but it can also be a trade-off relation, if actions implemented towards CE are not evaluated from a systems perspective. Tools of systems thinking enable the discussion of limitations and trade-offs, create awareness of rebound effects to mitigate them, include social aspects and reveal and help avoid shifting burdens between different stages in the life cycle. All of these are often blind spots if a concept or strategy focuses on one subsystem such as the economy. A systems perspective helps to understand, emphasise and remember that sustainability is a property of the whole system and not a feature of one component. The systems perspective also makes it natural to take a systems approach to the solution. The solution is a mixture of informative and enabling communication, which has greater potential to affect consumer behaviour (Mistra Future Fashion, 2019), which can be counted as a gain of using a systems perspective.

If we were to disregard the systems perspective for the sake of making the project less broad and more specific, it is likely that the project would have focused more on designing information about chemically recycled polyester. Efforts would have focused much more on ideating on communicating within the confinements of, for instance, the hang tag format. Chances are that spending less time on understanding the dynamics of this communication (as with the systems perspective) and more time on ideation, would have generated a great amount and variation of solutions perfectly within WRSD's niche. This approach would have given them a concept that they were content with, honed to perfection, in high resolution and ready to print. In other words, something that WRSD could implement right away.

However, it seems to me like such a project would fall within advertising or marketing more than it would user-centered design. User-centered design is holistic at its core. Ignoring the conclusion that information alone is not enough to meet the consumer's needs for help in changing their behaviours, would make a design solution that is no longer holistic nor usercentered. In addition, such a project would in and of itself not be effective in changing the values and practices of consumers, which would, arguably, fail to meet the requirements of WRSD more than that of creating a concept partly outside of their niche.

Guidelines

The guidelines produced in this project were formulated to meet the needs that were found among the three stakeholder groups. The guidelines correspond directly to the topics covered in the studies, ranging from consumer behaviour to preferred visual formats of product information. Because of the variety of topics, the result is a collection of guidelines that serves a variety of specific purposes. This leads to a very long list of guidelines that serve different purposes, contain a lot of insight but that cannot be used all at once in one concept, and that does not go deep enough into any of the specific purposes to be sufficient for making a design within that specific purpose.

Here is a sample of guidelines to illustrate how they are different types of guidelines serving different purposes:

Example	Type of guideline
The information should explain to the consumer how incorporating circular actions makes a difference. (2.3.12.)	Specific content design guidelines for product information
The amount of physical tags should be kept down. (2.3.45.)	General guidelines for user experience of product information
The information should transfer knowledge on material properties regarding use, recycling and production. (2.2.7.)	Guidelines for what specific knowledge should be communicated to the consumer

The information should explain how the garment stands out, or tell the story behind the garment if there is one. (2.3.3.)	Guidelines for designing product information to help the consumer to make informed decisions
The information should lean towards being concrete rather than abstract. (2.2.2.)	Rules of thumb for how to think when designing communication

Table 5. Sample of guideline types.

Looking at a variety of topics in this project has served the purpose of gaining a systems perspective on how the consumer relates to circular consumption, and what role communication has in that system. One trade-off of gaining a systems perspective is that it cannot serve the specific purposes within the system well, such as how to create a visual format that appeals to the consumer, or how to explain technical details in a manner that makes the consumer understand them. For those purposes, the systems perspective is useless; they each need to be looked at in depth in order to produce guidelines that satisfy the needs within each topic. The guidelines for a project with a systems perspective should therefore be formulated as guidelines for how to serve the *system* instead of the specific topics, in order to be useful for creating a design that serves the system.

The final design concept was a solution designed to serve the system, in which some of the guidelines were followed, but more as inspiration or suggestions than actual guidelines. Upon concept generation, it became clear that for specific solutions, solution-specific guidelines are required. For instance, if you were to design hang tag information, you would need hang tag-specific format and content guidelines. This project produced some guidelines of that specificity, but covered too many topics to produce deep enough and many enough guidelines of that specificity within each topic.

In order for the guidelines to be fully effective and useful for other designers, they should be re-formulated as system-level guidelines. Guidelines leading to designs that serve the business-consumer communication system instead of specific solutions. One of the reasons that the guidelines can be perceived as incoherent is because they were designed to be topic-specific, but often stray towards system-level. The result is that the guidelines serve neither of them fully. As a result, the design concept was designed to serve the system but was not fully based on the guidelines, but rather, the systems thinking that the project produced. The project could be refined by translating the studies to system level guidelines and letting the topic-specific guidelines go.

Also, the topic-specific guidelines answer the question "how should specific solutions be designed?", while system-level guidelines answer the question "what kind of solutions should we design and why?".

The system-level guidelines could look like the following:

- Enable the consumer to do circular practices that has practical barriers
- Encourage and enable the consumer to buy things they are likely to form bonds to
- Teach the consumer to identify their driving forces and needs
- Apply UX design to product information
- Make sure the consumer is never left with information they do not know what to do with
- Strive to transfer easily accessible knowledge to the consumer
- Consider complementing product information with other mediums to communicate with the consumer

This would make the guidelines more effective and readable for other designers or actors.

Contribution to the field and further work

Though there has been research made of how to walk towards a circular economy from a business perspective, there has not been much research made on the consumer's perspective, in spite of the fact that the consumer's role in closing the material loop has been deemed important (Selvefors et al, 2019). Providing the consumer's perspective is the main contribution to the field that the thesis makes. In addition, it provides a systems perspective on how to achieve a circular economy, as requested by Keßler et al (2021).

Since the project takes a systems perspective in order to understand connections and dynamics rather than diving deep into the specifics on any of the brought-up topics, every topic and theme brought up in the studies is a subject for potential further work. For instance, the notion of driving forces behind consumer behaviour could be its own user study, including more driving forces, based on more people, to increase its generalizability. Another example is the use cycle, that could be further elaborated in a variety of ways, such as adding information needs or enablement needs to the different phases and events.

Chapter 6: Conclusion The project reveals that a system perspective is needed to approach how to communicate a complex matter to a consumer with complex needs, in order to impact the consumer's practices and values. The result of having this perspective is the realization that the consumer has both practical and knowledge needs, which requires both enabling and informative solutions. It is also the realization that understanding the significance of chemically recycled polyester requires an understanding of its context, which requires communicating that context as well as the specific message. It is also the realization that this cannot and should not be communicated on a single occasion with a single medium because it is likely not enough to transfer the full picture to the consumer. The result is a 12-part communication concept that relies on a multitude of strategies, points in the use cycle, messages and mediums to get the consumer to achieve the full picture which leads to a thinking that helps impacting their practices and values.

The project addresses the consumer's role in the collective endeavor to close the material loop of the fashion industry, which is crucial according to literature, but not very researched in terms of what the consumer needs in order to enter into this role. According to this project what the consumer needs is to develop a circular way of thinking; and the solution applied is a combination of enablement and information that reaches the consumer beyond the means of traditional product information.

The potential impact of the project is that if this is actualized, the consumer's motivation can be channeled properly, resulting in them entering into their role of closing the loop with ease instead of burden.

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Appendices

I: Numbered guidelines II: Interview guide, consumer perspective study III: Interview guide, business perspective study

1.1. Initian 1.2. Ti 1.3. Co 1.4. Ti 1.5. Ci 1.6. Gr 1.7. Ti 1.8. Ti 1.10. Ti 1.10. Ti 1.11. Ti 2.1.1. Ti 2.1.2. Ti 2.1.3. Ci 2.1.4. Ti 2.1.5. Ti 2.1.6. Ti 2.2.2.1. Ti 2.2.2.1. Ti	Message in the separate parts i
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2.2.1. TI 2.2.2. TI	
2.2.2. TI	2.2. Consumer, General guidelines
	he information should be as clear as possible, both visually and content wise.
2.2.3. TI	he information should lean towards being concrete rather than abstract.
	he information should strive to anchor the consumer in the reality of the production.
2.2.4. TI	he information should search out the consumer instead of the other way around.
	he information should be designed considering the driving forces of the target group, estimating what criteria nost likely constitutes an informed decision among them.
2.2.6. TI	he information should transfer knowledge on recycling.
2.2.7. TI	he information should transfer knowledge on material properties regarding use, recycling and production.
	he information should reduce information that the consumer finds irrelevant.
	he information should motivate the consumer through educating, encouraging, instructing and offering, and not ust informing.
2.2.10. TI	he information should be well prioritized.
	he use case in which the information is needed in should determine the medium, the prioritization, the accessibility, the level of detail and the level of depth of the information.
	he information should be presented in a visual format that captures the consumer's attention.
	he information should clarify potentially ambiguous information such as origin, certifications, buzzwords and are instructions.
2.2.14. TI	The information should make sure the consumer is never left with information they don't know what to do with.
	he information should be user tested regarding how understandable and relevant the consumer finds the presented information.
2.	

	Guiding informed decisions
2.3.1.	Guidance of informed decisions should be emphasized in the information in the purchase phase of the use cycle
	Use and care instructions
2.3.2.	If the garment is intended for a specific use that is not self-explanatory, the information should provide a description of this use and instructions if needed.
2.3.3.	The information should explain how the garment stands out, or tell the story behind the garment if there is one.
2.3.4.	Instructions for use and care instructions should be placed so the consumer finds them while using it, according to likely use cases of the garment.
	Instructions for disposal
2.3.5.	The product site should be accessible online even when the product is no longer on the market, specifically so use and care instructions can be accessed when needed.
	Encouraging circular action
2.3.6.	The product should lead the consumer to the product site, or to the brand's general care instructions online, so that the consumer does not have to search it out themselves.
2.3.7.	Information about how to dispose of the garment correctly should be found online as well as permanently in the garment, but not disrupting the use.
2.3.8.	Information that encourages circular action should be emphasized in the information in the use and disposal phases of the use cycle.
2.3.9.	The information should actively encourage the consumer to incorporate circular actions in their use and disposal of the garment.
2.3.10.	The information should communicate a positive expectation on the consumer to incorporate circular actions in their use and disposal of the garment.
2.3.11.	The information should instruct the consumer how to incorporate circular actions in their use and disposal of the garment.
2.3.12.	The information should explain to the consumer how incorporating circular actions makes a difference.
	Knowledge expansion
2.3.13.	The information should give the consumer monetary or emotional return on investment for circular action.
2.3.14.	The information should use nudging to spur circular action.
2.3.15.	Knowledge expansion should be included in the information through all phases of the use cycle.
2.3.16.	The information should transfer knowledge on known knowledge gaps among the consumers: Which materials are recyclable.
2.3.17.	How to turn in textiles for recycling in practice.
2.3.18.	Whether one's textile waste actually is recycled if it is turned in for recycling.
2.3.19.	What level of the waste hierarchy the garments end up on at recycling.
2.3.20.	What a garment is turned into when it's recycled.
2.3.21.	What happens in recycling technically.
2.3.22.	What polyester is and that it's a polymer.
2.3.23.	What other properties different materials have; especially synthetic materials, mixed materials or materials that are "new" to the market.
2.3.24.	The knowledge-transferring information should explain why it is important and how it makes a difference.
	Creating trust
2.3.25.	The information should explain use-related material properties, not just state the material.
2.3.26.	The information should expand more on the properties of lesser known materials, and not as much on known materials.
2.3.27.	Creating trust should be strived for in the information in the purchase and use phases of the use cycle.
2.3.28.	Transparency should be strived for in the information. Welcome third party examinations and certifications, and display reviews from users.
2.3.29.	Information should be evaluated on whether it stands on its own or if it creates more questions. The information should review potentially ambiguous information such as: Whether the indication of origin is too simplistic
	Care labels with atypical instructions
2.3.30.	
	Fragmentary sustainability buzzwords
2.3.30. 2.3.31. 2.3.32.	

	2.3. Consumer, Specific guidelines, format
2.3.34.	The brand's sustainability analysis should be actively communicated.
2.3.35.	Dedication to something beyond sales should be communicated, if there is such dedication. It doesn't have to be sustainability but could be sports, nature or anything else.
2.3.36.	The information should highlight the most important information, and hide the least important information.
2.3.37.	The information should catch the consumer's attention with visually appealing presentation and packaging.
2.3.38.	Instructions should not be overly ambitious or include too many steps.
2.3.39.	Complex content should be simplified but not get a decreased level of detail.
2.3.40.	Images and symbols should be used when appropriate.
2.3.41.	The amount of text should be kept down.
2.3.42.	Placement and prioritization of translations should be thought through if regulations require several languages to be represented on printed information.
2.3.43.	The information should provide the option to expand or read more instead of displaying all information if it's a lot.
2.3.44.	The information should draw conclusions for the consumer about use aspects of the garment.
2.3.45.	The amount of physical tags should be kept down.
2.3.46.	The product information should be coherent and continuous within a product line.
	3. Business
3.1.	Be sensitive about the client brand's values when designing information.
3.2.	Consider complementing communication through the client brand with other mediums to get full freedom of message and visual expression.

Interview guide, consumer perspective study

1. Vi tänker oss att du ska köpa en funktionsjacka (skidjacka, skaljacka eller dylikt).

Jag kommer räkna upp några aspekter av ett plagg som kanske kan påverka ditt köp. Jag vill att du säger ja om det är en parameter som är viktig för dig och nej om det är en som du inte tänker på.

Behov, användningsområde, pris, kvalitet, material, funktion, prestanda, social hållbarhet, miljömässig hållbarhet, livslängd, status, stil, återvinnbarhet, märke, annat?

- a. Vad är ett informerat beslut för dig?
- b. Hur viktigt för dig är det att göra ett informerat, genomtänkt beslut?
- c. Känner du att du kan påverka jackans livslängd (genom att vårda plagget)?
- d. Om jackan går sönder bortom användning, vad gör du med den då?
- e. Skulle du kunna tänka dig att lämna in jackan för återvinning?
- f. Varför/varför inte?
- g. Vad hindrar dig från att vårda en skaljacka?
- h. Vad skulle motivera dig att vårda en skaljacka?
- i. Vad hindrar dig från att lämna in en skaljacka för återvinning?
- j. vad skulle motivera dig att lämna in en skaljacka för återvinning?

2) Vi tänker oss att du ska köpa en t-shirt.

a. vilka parametrar påverkar ditt beslut att köpa? Behov, användningsområde, pris, kvalitet, material, funktion, prestanda, social hållbarhet, miljömässig hållbarhet, livslängd, status, stil, återvinnbarhet, märke, annat?

- b. Vad är ett informerat beslut för dig?
- c. Hur viktigt för dig är det att göra ett informerat, genomtänkt beslut?
- d. Känner du att du kan påverka t-shirtens livslängd (genom att vårda den)?
- e. Om t-shirten går sönder bortom användning, vad gör du med den då?
- f. Skulle du kunna tänka dig att lämna in t-shirten för återvinning?
- g. Varför/varför inte?
- h. Vad hindrar dig från att vårda en t-shirt?
- i. Vad skulle motivera dig att vårda en t-shirt?
- j. Vad hindrar dig från att lämna in en t-shirt för återvinning?
- k. vad skulle motivera dig att lämna in en t-shirt för återvinning?

3) Nu kommer jag räkna upp lite olika former av information igen, och när jag har gjort det så ska jag ställa lite frågor då vi kan ha de olika sorterternas information i åtanke

material, ursprung, funktion, prestanda, skötselråd (inklusive tvättråd), hur plagget kan återvinnas, hur miljövänligt plagget är, hur socialt hållbart plagget är

a. vilken av den informationen tar du till dig? vilken av den informationen är relevant för dig? vad säger den informationen dig? vilken information reagerar du på?
b. är det någon av den informationen som du saknar, men hade velat se?

c. är det lagom mycket information?

d. är informationen lätt eller svår att förstå och ta till sig? är det lagom detaljrikedom?

e. föredrar du att dra dina egna slutsatser, eller vill du att informationen ska dra slutsatser åt dig? exempel...

f. intresserar den här informationen dig?

4) Nu kommer jag räkna upp lite olika kanaler som man kan få information om ett plagg genom. för varje kanal vill jag att du ska säga fördelar och nackdelar med denna kanal.

- Taggar i plagget
- Permanenta lappar i plagget (e.g. tvättråd)
- Tryck i plagget
- Information på hemsida
- Information från butikspersonal
- Sociala medier
- Reklam/marknadsföring
- Dokumentärer, artiklar etc
- google, internet, youtube
- kompisar

5) Kan du berätta om ett tillfälle då du köpt ett plagg som kändes som ett dåligt köp? Varför köpte du det och varför kändes det dåligt?

6) Kan du berätta om ett tillfälle då du köpt ett plagg som kändes som ett bra köp? Varför köpte du det och varför kändes det bra?

7) Vad händer med ett plagg när du lämnar in det för återvinning?
8) Om du köper ett plagg som är marknadsfört som tillverkat av återvunnen polyester, vad tänker du att man har återvunnit för typ av produkt då?

9) Har ett förbrukat, oanvändbart plagg ett värde?

10) Vad skapar känslan för dig av att ett plagg är hållbart? (alltså sustainable, inte slitstarkt)

Interview guide, business perspective study

- Ni har ju ett tydligt hållbarhetsarbete i er produktion. Är det viktigt för er att kommunicera det till era kunder? Hur får ni ut det till dem?
- Hur responderar era kunder på det arbetet? Upplever ni att era kunder är engagerade i ert hållbarhetsarbete?
- Hur går det till när ni designar information till era kunder? Hur ser processen ut? Vem/vilken avdelning bestämmer vilken information kunden ska få?
- Hur ser processen ut när någon av era leverantörer vill skicka information med en produkt?
- Vad fungerar bra och vad fungerar dåligt i arbetet med att ta fram och få ut information till era kunder?

DEPARTMENT OF INDUSTRIAL AND MATERIALS SCIENCE CHALMERS UNIVERSITY OF TECHNOLOGY Gothenburg, Sweden 2021 www.chalmers.se

