Sustainable shopping

TPD4200 Sustainable design
Final report

Group 2

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Abstract

The focus on environmental and ethical problems are ever increasing, and a demand for more sustainable solutions is on the rise in every aspect of our society. With this as the backdrop we have studied facets of everyday life where the sustainability can be improved, and delve further into the practice of shopping. Here we will present an idea of how shopping online can be made more sustainable, and make sustainability as natural a factor to consider when shopping as prize and features are. Today, many labels exist to indicate various qualities of products, but here it is theorized that a way to directly compare alternatives, and make as much information as possible as readily available as possible, to a greater extent would lead to consumer insight and thus a more sustainable shopping habists.

Contents

Part 1: Pre-solution

Idea Generation and Selection of Practice

The ideation process started with discussing common everyday activities and reviewing what practices could be improved in regards to sustainability. In order to find our practice we tried different strategies. One of which was coming up with many arenas without focusing on a practice, and later discuss practices connected to the arenas. Another one was starting with possible solutions. We were really intrigued by something called the "fun theory" and used this as a brainstorming tool to come up with practices that could be improved by making it more sustainable while making it more fun at the same time. We had several sessions where we focused on both small practices such as laundry, showering, having a cup of coffee etc. and bigger practices/ industries such as exchange of kids toys, buying christmas gifts and heating of houses. During this session we found that both the small and big practices were interesting topics to handle.

The main dilemma we faced was that improving the larger practices, even though it would have a greater positive environmental impact, seemed less plausible to be realized. The smaller practices on the other hand could be improved with smaller and more implementable solutions, but would also have a smaller positive impact. We were determined on finding a practice that was big enough for the solution to be impactful, while still being able to provide a realistic concept.

One resemblance between the different practices and associated initial ideas we discussed was that we wanted to create a change of attitude within the user. This could mean anything from facilitating for minor changes of habit, to implementing a comprehensive score system for sustainability through several practices. We found out that communicating information towards the user would be a good start for a change of attitude.

After several brainstorming iterations and discussions of both practices and initial ideas of improvement, we decided on the **practice of shopping**. The practice is performed by everyone, either because we need something new, to replace something that is broken/ outdated or because we just want something that will give us temporary joy.

To further narrow down the practice we chose to focus on the **practice of shopping clothes**. We found this to be the category with the most accessible and concrete numbers regarding environmental impacts and life cycle assessment. This choice was also motivated by the survey we did on second-hand shopping (Figure 1) that showed that clothing was one of the top categories that people would be interested in buying second-hand.

We soon found that most of our initial ideas were connected to online shopping, also, online shopping is a growing market. "*Shoppers now [2016] make 51% of their purchases online, compared to 48% in 2015 and 47% in 2014.*" (Farber, 2016) In order to make a practice more sustainable it is important to make it so for the future. We therefore decided to further specify our practice to **online shopping** of clothes. While generating ideas for a solution on this practice, we found that one of the biggest challenges with the practice is that sustainability is often not among the factors taken into consideration when comparing different products. Evidence for this is found in our concept research, where Appendix 1, Figures 1 and 2 shows that few people have knowledge of the different sustainability certifications, and Appendix 1, Figure. 3 shows that even fewer take them into consideration when shopping. We want to make sustainability a natural part of the shopping process, but we want it to be easy, accessible and time efficient. The goal is that users who wouldn't

automatically consider sustainability can be made aware of more sustainable alternatives when shopping. This can be implemented both for second-hand alternatives and more sustainably produced clothing.

Practice Research

When working with different ideas for a solution we wanted to gain insight in what potential customers will be willing to buy second-hand. Encouraging second-hand shopping rather than buying something new is a way to create a more circular, and also extended, life cycle for a piece of clothing. To gain this insight we created a questionnaire that we shared on Facebook. Link to results from the questionnaire is found under sources.

- We got most answers from people between 18 and 24 years old (74%).
- 97% of the people we asked said that they would buy used instead of new items.
- Those who said they would not buy second-hand said that buying new was more convenient and gave them a better feeling.
- A lot of people said they would shop at a second-hand store or a market website like finn.no or Tise.
- The main reasons for shopping second hand was price, and also sustainability. Things like finding unique pieces, or having more options were also mentioned.

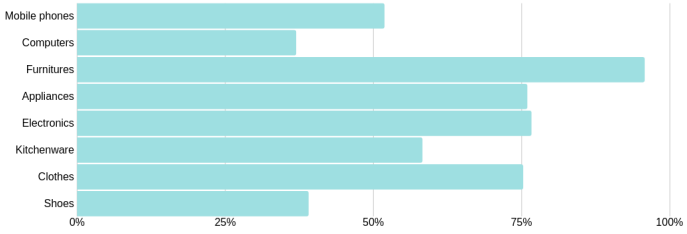


Figure 1: For those who said they would buy second-hand, the top categories were furniture, clothes, electronics and appliances. It was possible to choose several alternatives.

We found this information helpful, especially because it confirmed our suspicion that people were positive towards buying second-hand instead of new.
We kept working with the practice of online shopping and came up another idea for a solution; that buyers with one easy click would have all products on a website sorted from most sustainable to least sustainable, just like it would with price, popularity etc. One condition for this solution would be that we, as a third party between producer and retailer, got sufficient information about the production of each product in order to be able to compare different ones.

We decided to focus on one of the top categories from the questionnaire that people said they would buy second-hand, therefore choosing the practice of shopping clothes. We then contacted some online retailers and also clothing producers to see how easily they can collect and share information about clothing production. We contacted producers like ALFA and Helly Hansen, and also one big clothing distributor, Zalando. Since we started the project, Zalando has gotten a “sustainable”-category on their website, so we found it interesting to see how they managed to sort out items of clothing.

Main Environmental Impact

The main environmental challenges from the life cycle of one garment are connected to multiple factors. The non-circular life cycle of clothing is the most common today, and unfortunately the most damaging to the environment. The environmental impact would be much lower by expanding the lifetime of the garment and also by reducing the distance of transportation, water use and chemicals in the production line.

Figure 2: Diagram showing the life cycle for a common cotton t-shirt

Research done by *The Pulse on the Fashion Industry*, put together in a report by the Boston Consulting Group in 2017, estimated that during 2015 the global textiles and clothing industry was responsible for the consumption of 79 billion cubic metres of water, 1715 million tons of CO2 emissions and 92 million tons of waste. (Global Fashion Agenda & The Boston Consulting Group, 2017)
In the upcoming list of the production steps from one example, a common cotton t-shirt, we will look into the most significant steps regarding the environmental impacts and also gain deeper insight in why the numbers The Boston Consulting Group presented are so high.

1. **Growing and harvesting the cotton** is the first step in the production line and the most environmentally destructive. To grow enough cotton for one t-shirt it is estimated a water use of 2000 L – enough to fill 20 bathtubs. (Chua, 2012) The process also requires a lot of chemicals like insecticides and pesticides. In total the world's cotton farmers apply US$ 1310 millions of insecticides to cotton each year: far more than is applied to any other single crop worldwide – including maize, rice, soybeans and wheat. (Environmental Justice Foundation, 2007)
2. **Cleaning, spinning and weaving the cotton** is the next step in the production line. This creates packaging waste, fibre waste and also cleaning and processing waste.
   It also creates significant amounts of emission from the boiler, high temperature ovens and fabric manufacturing. (Toprak, Anis, 2017)
3. After weaved into a peace of sheet, the cotton fabric is **sewn, dyed and washed.** This process creates yarn waste, packaging waste and also demands materials for maintanence. For the dyeing and washing process chemical processes and chemicals like alkalinity, sulphide and surfactants are used. (Toprak, Anis, 2017)
4. **Labelling, packaging and retailing** is the last process in the production line and the second last in the life cycle of the t-shirt. It creates emission from printing and transportation. It also requires energy consumption from storing the finished garment. (Toprak, Anis, 2017)
5. **End-user-consumption**
   As shown in Figure 2. "The life cycle of a t-shirt"; the environmental impact can be affected on which choices the end-user makes after usage time of the shirt. The most convenient for the environment is to re-use or recycle the t-shirt, and not throw it away.

Transportation between the different steps is not mentioned in the list.

Once the cotton leaves the farm, textile mills ship it to a spinning facility, usually in China or India. After being sewn the garment is shipped to high-income countries, often in Europe - which requires different means of transportation like ships, trains and trucks to travel an enormous distance across the world. This leaves the clothing industry responsible for 10% of the global greenhouse gas emission. (UN Climate Change, 2018).

Improvement of The Practice

As previously stated, we wanted to tackle something big enough to have an impact, but small enough to be able to be conceptualized. Changing the world does not happen overnight, but a seed can be planted. This seed might grow into something lasting, but that will take time. Having this vision in the back of our heads lead to some interesting and impactful ideas, and a lot of our concepts were influenced by this mindset.

As previously stated, our practice started as shopping and soon converged into online shopping. Big-data driven approaches, mobile tailored stores, subscriptions, social media influencer and new technology as VR/AR are all being used to sell more to consumers (Roy, 2016). The development is inevitable and unstoppable.

The most effective method would be to stop

shopping in general, but maybe the solution is not to fight it. Instead, we can use their methods to our advantage. The battle has to be taken in the meeting point between the consumer and the retailer, presenting a better alternative compared to todays situation. There is little we can do about the lust of buying, but we can influence the decision of what to buy. This initial intent led to several concepts, some of which will be described here.

Buying second-hand
Buying used products is generally better for the environment, and a lot of experimentation was done toward fronting this as a better alternative while shopping. This sets the expectation that the user/consumer has already decided to buy something due to lust and/or need.

While shopping for a specific item, the consumer can be given a nudge to see used versions of the item. This idea can be conducted through several means, two of which we made concepts of.

The first concept took the functions from a library bus (traveling library) merged with an ice cream van, making a vintage store on wheels. The goal here was to encourage children to bring more used clothes, equipment and toys into their lives in a fun way.

The second concept was basically a web browser-extension (ad-on) for Finn.no. The idea was that when a user adds an item to their shopping cart at an online retailer for new products, the extension browses Finn and presents a second-hand option to the user.

Both concepts are making the assumption that the user has already decided that they want to buy an item, but we can redirect the focus from buying new to buying second-hand.

Influenced buying
What if the user does not want to buy second-hand, and thinks that newest is best? This lead us down another path; how we can educate the user towards choosing a better option. How can information about production and transportation of textile be presented to the user, making them consider different options? In our final concept we took these questions and tried to answer them, taking small steps toward more sustainable shopping. As mentioned, there are currently several environmental labels used to guide the user, but, as later research will suggest, this is not enough.
We can make it better.

Part 2: Solution & Post-solution

Design brief

Our idea is to provide understandable and specific numbers in order for customers to easily compare items and consider sustainability while shopping clothes online.

The target user for this service is a person who has already decided to shop for clothing. Our intention is to make the shopping that is already happening more sustainable, and not to prevent it from happening in the first place. We want to meet the consumer where they are. The user is someone who is working towards being more environmentally friendly, but they don't have a lot of knowledge on the topic, and it is not a big part of their daily life. They are keeping up with trends and values of the people around them, and since sustainability is a topic that is "on the rise" they want to be a part of that development. We also want our service to be useful to anyone interested, regardless of their investment level, and hence strive to provide information in sensible layers.

The objective of our solution is to make the user aware of a more sustainable alternative while shopping. To do this we will help the customers to compare the different items of clothing via an intuitive rating system.

The message is to encourage sustainably conscious choices when shopping clothes online. The goal is by making it more convenient for the buyer to choose a more sustainable option, the more sustainable clothing items will have higher sales numbers, and that this will motivate the clothing producers and retailers towards being more sustainable.

The solution must enlighten, encourage and guide the user in their pursuit for sustainability, and also be a reminder. It should show the sustainable options without being obtrusive or annoying.

Concept Selection

As mentioned in the introduction, sustainability is rarely a common thing to look for while buying new products. This is derived from a user survey where we tested people's knowledge of Norwegian Consumer Council (Forbrukerrådet) list of certified labels concerning the environment.

We performed the survey by showing people pictures of the different labels, and asked if any were familiar and if they had knowledge of what requirements that are set for each label. Lastly we asked if they took any of them into consideration when shopping. The people we asked were different aged people in different life situations. The results of the survey can be found in Appendix 1.

As we can see from the diagram on familiar labels in Appendix 1, Figure 1, people are familiar with some environmental labels, such as "Svanemerket", "Ø-merket" and FSC. But very few have heard about the textile related labels included in the survey.

The diagram in Appendix 1, Figure. 2 illustrates the environmental labels people have some knowledge of. The graphs show that none of the people that we asked in our survey had knowledge about labels concerning the clothing industry.

Lastly, we can see from Appendix 1, Figure. 3 that few people in general take labels and certifications into consideration when shopping. Furthermore, none of the people asked in the survey take the textile-related labels into consideration when shopping.

When asked why they did not take the labels into consideration, people tended to answer that they do not fully trust the credibility of the labels. Others said that the labels only fulfill some demands, while more important ones are left unattended. Others said they thought of

such certifications as commercial assets added to products to increase sales numbers.

As seen from this survey, average consumers do not have the best knowledge of certifications. Apparently, certifications is not the way to go when trying to inform people about sustainable shopping. Everyone has their own mental model when it comes to sustainability, and taking a step forward from the previous survey we wanted to know what people think of when presented with the statement “Sustainable Shopping”. We believed that this could tell us more about what factors to focus on when developing our solution.

The result from this was put into a relative diagram.
While reading the results, it is important to note that we are looking for what categories score in relation to each other. The results from this survey is represented as a diagram in Figure. 3.

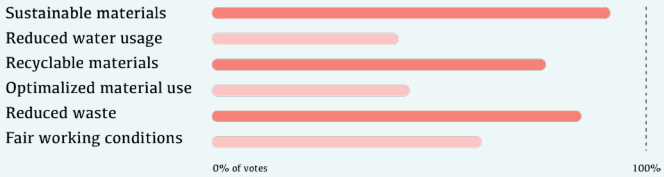


Figure. 3: Diagram visualizing what percentage of the voters chose which category to be of most significance when considering sustainable shopping.

From the start of this project the goal and focus has been finding a solution that can change people’s attitudes and perspective. For this reason we pathed away from solutions regarding tiny incremental changes in production or packaging. We thought that solutions like this would not reach the consumers mind, and hence not approach the problem that is people’s lack of awareness. Resulting from this, the assortment of solutions we delved further into was to a large degree information based. The ideas were rapidly narrowed down to a few that focused on comparison. Either comparing first- and second hand shopping, or one new product to another. At one point or another, someone must get something first hand, and thus the latter was chosen. With this solution the customers could get a peek into the complexity of production, and thus gain a greater insight than through the obvious “*not producing an item is better than to produce it*”, which is the main environmental reasoning behind second hand shopping.

To make sure the solution easy, understandable and appealing to customers, we wanted to limitd ourself to some categories to measure sustainability. We picked categories based on what we knew customers would care about (Figure 3). Both for the sake of the customers familiarity, and the brands “security”, by ensuring interested customers. The categories chosen; material production, waste and transportation, gives the customers insight in different garments life cycles. Depending on people’s willingness to prioritize the more sustainable clothings, the solution can make significant impacts in several areas.

From a triple bottom line perspective, the environment section is what receives the most direct advantages. The complex calculations used to rate the products (which will be described in the next section) consider many factors, and from the three categories chosen, a wealth of different benefits could be reaped. Materials used in product and packaging could improve, if people value and use the rating provided by our solution. The same can be said for power use in production, product recyclability, waste, impact on local nature from said waste and CO_2 emissions both in production and transportation. These are all aspects that could improve if customers choose items with good ratings.

From a societal viewpoint there are also potential advantages. If people care about the rating and what it means, continued purchasing would, by the nature of our solution and capitalism, lead more brands to produce better rated clothing. This would result in an increased breadth of sustainable products availability. As the solution is inherently focused on “informing”, it is bound to increase the knowledge of the users. Either as little as showing a comparison between clothes, and through more in depth information offered in a layered structure, to the more interested

users. If people adhere to the rating system, a better environment could have secondary social impacts. E.g. could a decrease in waste and hazardous material provide health benefits for people, especially in the local environment. Letting people know they make "good choices", can also give customers a sense of good conscience. There are some potential backlashes accompanied by the idea of "buying good conscience", and other elements that has been noted here, and these rebound effects will be discussed later.
In addition to the social factors mentioned, the solution also has the possibility to expand into more factors. Categories that would be natural to include in the future would be ethical work conditions etc. It is reasonable to imagine that if this was a part of the rating, the conditions would improve as long the customers value it.

The economical bottomline is based on a shift in consumer's buying habits. The current rise in environmental consciousness will generate more environmentally conscious consumers. Since there is currently no good solution for this growing marked, obtaining these customers will have a great economical benefit. Although a sustainable shift in production and gathering information will lead to rising expenses, we believe the improved reputation and the new customers will counteract these expenses. If recyclable materials are used, there is recycling revenue to be gained as well. Anyhow, as the solution is non-forcing, the buyer still have the option to save money by choosing the cheapest or even unrated clothing.

Concept detailing

Interviews

While conducting our research, it became apparent that we needed to gain insight into how production information is gathered and processed within the manufacturers. Through contacts in the business of selling products, we got to communicate with several representatives of major brands based in Norway. In Appendix 2 one can find transcribed texts from conversations made by phone and over e-mail. The communication was done in Norwegian, meaning the text has been interpreted and translated.

Before approaching the companies, we had some prerequisites toward the kind and amount of information we were gathering. The conversations were mostly semi-structured, but some questions had to be answered;

- How do you work towards meeting certain environmental goals/standards?
- How do you profile yourself with eventual goals you have reached?
- How do you go about changing design / production methods to meet ethical and sustainable goals?
- What kind of information around your own production are you gathering, and how do you assess it?
- On which factors do you consider the "sustainability" within a product?

In addition to Helly Hansen, Work Wear Helly Hansen and Alfa we also contacted Bergans and Colombia. Their comments were not as detailed, but reflected a lot of what Helly Hansen had to say.

Retailers

Getting this information from the manufacturers gave us good insight into how they go about making new products. Using this production information we can compare products to each other and present this to the consumers. This means meeting the consumers where they buy products, the retailers.

As of January 2019, when we started the project, the available information regarding clothing items sustainability was either non-existent or inadequate. During our project period, Zalando, a multi national online retail store, had been developing and launching their own "sustainability filter". This is basically a checkbox, showing the user the products that have been branded as "sustainable". However we believe this system is insufficient to make sustainable choices, since it is based mostly on the labels we tested in the Label Survey (Appendix 1), and some other labels created by Zalando them self. There is no detailed

description, or links that lets the customer know on which basis the clothing item is marked as sustainable and no way to compare different items within the sustainable category. We wish to make a different system with more focus on transparency and make it easier to compare different items.

We wanted to know more about how they developed the feature, so we asked:

- Which factors do you take into consideration when saying some items are more sustainable than others?
- How do you get this information from manufacturers?
- How easy is it to interpret the information given to you by these mentioned manufacturers?

The response was (edited and shortened);

> *We maintain a good level of cooperation with our manufacturers, and we are careful to get the right and updated information. We are always carefully considering which partners we wish to work with, and an essential criteria is that we get the information we need and want.*

Takeaways

We have been getting a lot of good information from a selection of our stakeholders. From the manufacturing side, we see that there are a lot of information being stored at various stages in production, and most of it are actively being used within the companies. The manufacturers have a lot of information accessible, but retrieving information is mainly motivated by economical profit. From the retailer side, our assumptions toward people being more conscious while buying are true, and the retailers are working toward meeting this demand. The retailers are also taking various precautions while choosing what partners they want to work with and what / how much information they need from them.

Concept

Our solution is a third party service that includes a system for gathering and storing information, a basis for how to calculate a score on which to sort and compare clothing items, as well as a user interface that present the information to the customers. Through the manufacturer research we found that some of the manufacturers already have a decent system for gathering and storing information. Based on this we decided to focus our scope on how to calculate the score and how to present it to the end user, while still having a clear idea of where and from whom we obtained the information.

We want our system to be more effective, transparent and easier to use than the existing label based solutions. Our goal is to present the costumer with a single number, which we will refer to as the *Clothing Sustainability Index* number, or the CSI number. The CSI number is an estimate for the items sustainability throughout the production, the shipping and the afterlife of the product. To make sure that the ranking is transparent for the user, the interface, which will be discussed in further detail later, also provides deeper levels of information. This includes three subcategories with three subscores in which the CSI number is based on. The three subcategories are production, transportation and waste, based on study showed in Figure 3 and interviews appendix 2. The production category will cover everything from water consumption, power usage, chemical pollution and other factors relevant to a given production process or material, all the way from the cotton fields to the finished products are packed and ready for shipping. The transportation category includes all transportation, from the factory to the retail warehouse. The transportation concerning raw materials, threads and unfinished textile sheets will be merged with the production category based on an average travel distance since there in many cases are several suppliers with different transportation distances. The waste

category covers both the environmental impact of the packaging, the garment, and the waste generated throughout the production.

Score calculation

To calculate a score for every individual product we needed an adequate basis to rank the items. We wanted it to be a universal index for all clothing items. This requires that the index is based on easily accessible information, and that the span of information is adequate to say something about the entire environmental impact of the product. In the research phase we talked to some manufacturers, and based on the information they had available we decided to use Higg Material Sustainability Index (MSI) (Higg MSI, 2019) as a basis for the calculation of the production and waste category.

Higg MSI

The Higg MSI was originally developed by Nike, and later adopted by the Sustainable Apparel Coalition. It is used as a universal tool to measure the environmental impact of material production. As of today the MSI is mostly used by companies internally to estimate

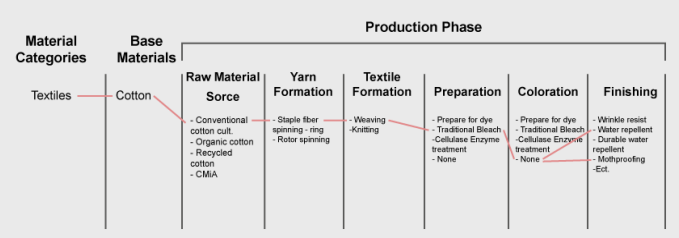


Figure. 4: Basic architecture of the Higg MSI.

environmental impact and to make them take informed decisions (Higg MSI, 2019). The data MSI needs to estimate a score is easily accessible in the supply chain. It includes raw material, yarn formation, textile formation, preparation, coloration and finishing.
Figure 4 shows the basic architecture of the MSI score. Every category is further specified. For example; “Spinning, cotton, for knit, open end (rotor) (200 DTEX-180 denier-30/1 Ne-50 Nm)” (Higg MSI cotton fabric, 2019) is one of 41 possible options for Yarn formation of ordinary cotton. By using the number generated by the MSI, we intend to multiply it with the weight of the garment and use it as the subscre for the production category.
In the same way we intend to use the MSI to calculate the amount of waste generated under the production phase and the environmental impact of the product packaging.

Transportation

Transportation is major part of the environmental impact for the textile industry, and is not covered by the MSI. From the research phase we know that suppliers are able to backtrack shipping information several steps down the supply chain. This means we are able to make an estimate for the environmental impact of transportation as well. To do this we take into consideration the means of transportation and the traveled distance. The weight of the product including packaging is multiplied with the travel distance and a fixed number based on the means of transportation. The given constant for the different means of transportation is based on CO_2 emission per ton of cargo per kilometer.
In our solution we have based it on research study done by the International Maritime Organization, which takes into consideration variables like type of transportation (general cargo, bulk carrier, heavy goods vehicle, diesel locomotive, ect.), average cargo capacity, average yearly capacity utilization, service speed, transport work per ship and loaded efficiency.
(Buhaug, Ø, p.131, 132,133).

Suggested Interface

We believe that it is necessary to have a clear recognizable graphical profile if we want to be a third party service operating on different websites. This way the costumer can identify the score, and use it as an universal measuring tool.

To let people learn about our service we present them with a little explanation box on the top of the page (Figure 5.). The box only appears after you check off the sustainability button on the page, that way it is not intrusive for non-sustainable shoppers. The info box contains the most necessary information, including a

global average for the chosen category to set the numbers in context, a brief explanation of the categories taken into consideration, and a short sentence explaining that a low number is better. If the customer want more information they can click on the box.

If they choose to click on the box it will expand (Figure 6.), showing a more detailed explanation of each of the three categories. They will also be presented with a simple illustration which clearly states that a low index number is better. The page also allow the customer to see an example of how a score for one particular item is calculated. In an updated version it could be interesting to try making the example interactive so that the user can try to swap the parameters and see how it affects the score. The page will also contain links that allows the user to learn even more, by being redirected to either our own or the Higg MSI website. All the layers of information is something we think is crucial for the solution. This way people with low interest can shop like they are used to, the ability to further check the criteria of which the score is based on gives the score credibility and makes it much more transparent than the environmental labels we are used to.

When the customer browses through the products they can easily hover the mouse over the score to see to what extent the three categories contributes to the total score (Figure 7.). The main reason for this function is to let the costumer get a sense of understanding and context since it may be hard to relate to a random number. We hope that over a longer period of time the user will get a sense of relation to the score.
If the user wants more information about this particular product and how the score is calculated they can click on one of the bars, this will give them specific numbers for the given item (Figure 8). This gives the service total transparency, and lets the user see the exact information the score is based on. In the example you can see the category transportation, with the number of kilometers traveled and the means of transportation. While testing the solution we learned that people lack the sense of distance when they are presented with a single number of kilometers, so we added the names of the cities to the travel route.
The suggested interface also lets you sort the items by the index score. The idea is that we do not necessarily sort all the items by the score to begin with, since this may lead to unwanted items appearing first. For example, when you sort items like shoes by price today, you often only see shoelaces and shoe cream for the first 2 pages since that is much cheaper. We believe that the score can have similar problems if you only sort the items by the index score. The best solution is therefore to make an algorithm that sort items by sustainability and relevance, and rather make it an option for the costumer to sort it entirely based on the sustainability score.

Interface figures are found on the next page

Figure 5.

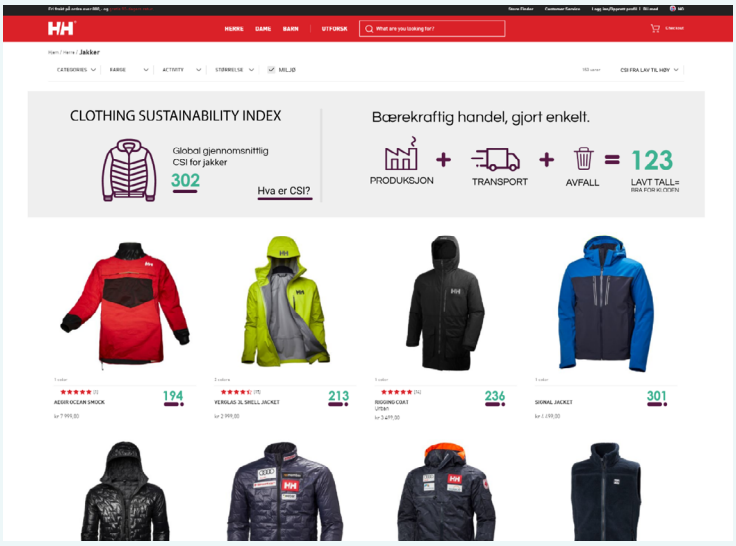


Figure 6.

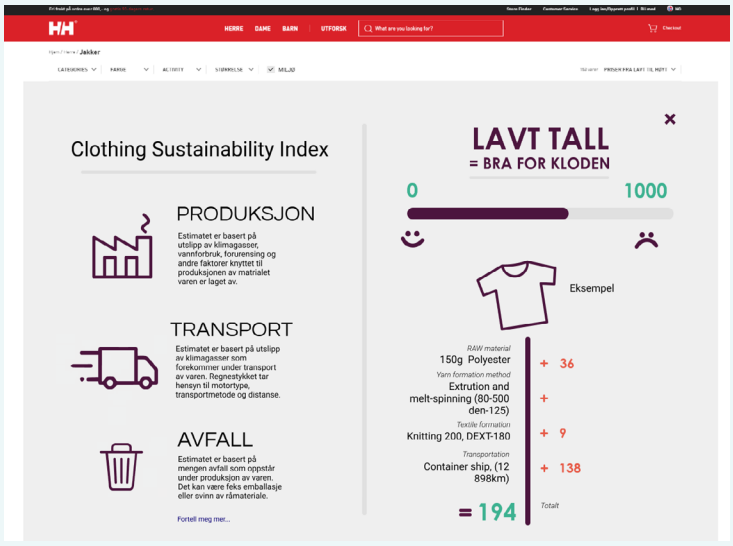


Figure 7.

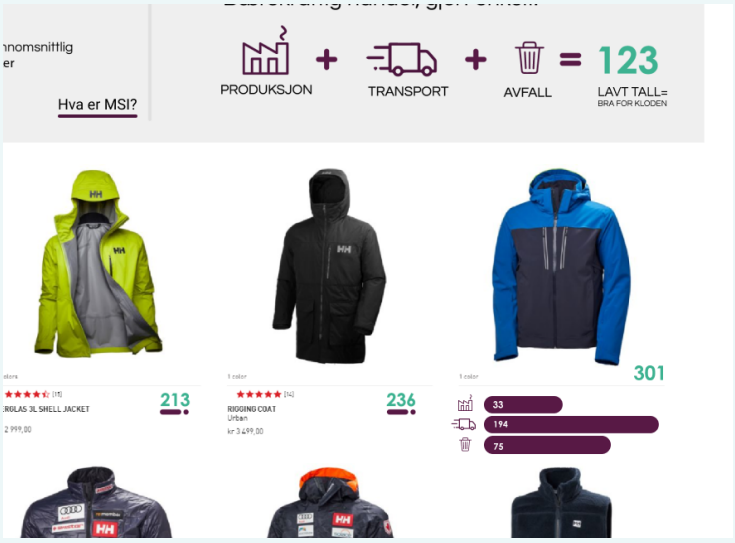
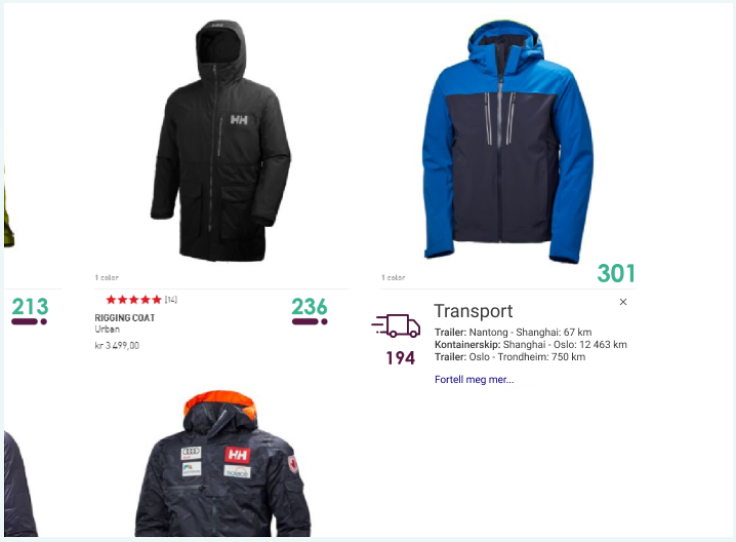


Figure 8.



Stakeholder strategy

Target User

As seen from several different motions in today's society, problems regarding the environment is on the rise. For example the students strikes spreading throughout Europe this last year (Holmes, M., 2019), show that the zeal for a more sustainable society is prevailing. Based on this our target group is everyone who, to even the smallest degree, share a motivation to adapt to a more sustainable future. People who in some way or form want to adjust their lifestyle to give the world a helping hand, but who might lack the knowledge to make said choices.

Stakeholders motivation

The target user group is the key to success to our stakeholders. This customer group is significant, not due to their numbers alone, but also their age. A large part of the group is youth who will continue to bring value into the future. Accompanying these consumers in their quest for sustainability will put the stakeholders in a fortunate view of the society. The retail stores need to keep up with trends and demands from the marked, and a clear trend is the rising awareness of the environmental problems.

Since there is no sufficient online platforms for sustainable shopping, and a fast growing number of people with environmental interests, we believe that our system will generate a large number of customers to both the manufacturers and the web stores that use our service.

Due to the unobtrusive nature of our solution, the sustainable direction of the stakeholders will not scare away the consumers with more conservative views, meaning there is little to loose, but a lot to gain when implementing it.

Startup strategy

To launch the service we will need one online retail store and at least one brand, both Alpha and Helly Hansen could be potential candidates since they already have gathered information about their products. When the consumer check of the sustainability box, only the brands that have provided the information will show up. This will hopefully create a market pressure once the other manufacturers discover that they are missing out on potential customers and a great opportunity to brand themself as sustainable and transparent.

Scalability

The system has great scalability. It can be implemented on several websites and

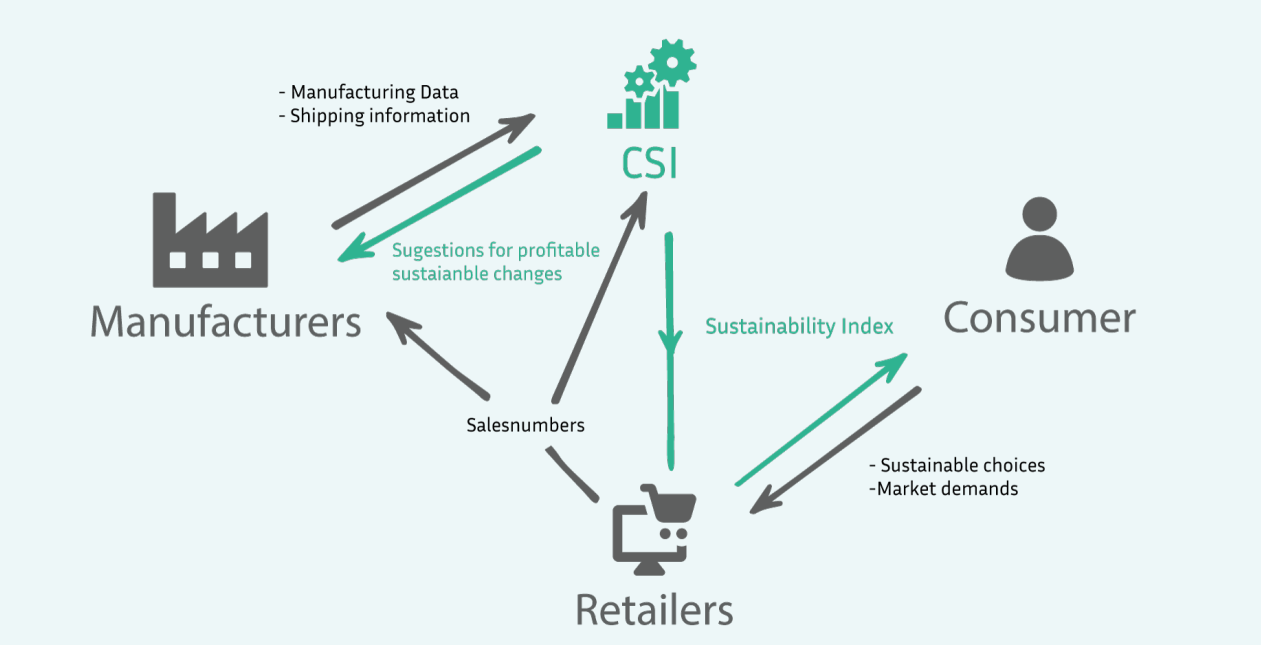


Figure 9 Stakeholder system

can contain a great number of brands and manufacturers. It is important that the manufacturers do not look at the index as a shaming service. We want as many manufacturers as possible to share the necessary information, so it is important that all contributing manufacturers are seen as better than those who do not. This is something we will need to implement in our interface. If many manufacturers contributes information it will be much more convenient and generally less sacrifices to use the filter. If the general consumer starts using the sustainability filter as default, it will become crucial for all brands to appear in the sustainable filter.

As mentioned earlier the information needed in the calculation is managably low, and many companies have already started to gather this information, so it seems plausible. Obtaining this information also has other benefits. As Harald Johansen from Helly Hansen mentioned (Appendix 2), information from the supply chain also function as a quality insurance both for the costumer and the manufacturers.

Manufacturers deliver manufacturing data and shipping information to our third party service (Figure9). We calculate the CSI score, and we present the information through the retailers website. The customer respond by choosing sustainable alternatives. The retailer forwards sales numbers to us. With big data analytics and artificial intelligence we can provide suggestions for profitable sustainable changes to the production, by observing which products sell better with low index scores, and which sustainable changes has the biggest impact for the lowest cost. This way we can ensure both the economical and environmental bottom line for our solution.

Unintended Consequences, Rebound Effects, and Ethical Challenges

There are several potential backlashes with a solution like this. The most prominent possibly being the self-trickery. A bi effect of emphasizing some products as very sustainable, might confuse customers to think that it is good for the environment. However this is not the case. Not buying a new product will always be the most sustainable action, and buying the more sustainable piece of clothing will only be “less bad” than buying clothing with a worse score. In the same vein thinking that buying two pieces of clothing with score 100 is one-to-one with buying one piece of clothing with score 200 is not necessarily true. Finding the score is a complex calculation, and still it is important to emphasize that it is only an estimate. Especially when considering that the three preliminary categories chosen only portray parts of this complex estimate. More facets can and should be considered, and a more complex calculation is available for the more curious customer. A considerable point of interest is that the process of giving a piece of clothing a specific finishing might be worse for the environment and give a bad score. However, what if this finish substantially increases the longevity of the garment? A complete calculation would have indefinite variables, but we have concluded that limiting the initial information to the regular customer is crucial to give a sense of insight without overwhelming them.

Another potential problem are the socio-economic ones. On a local scale less wealthy people might be labeled as “environmentally hostile” if unable to prioritize buying sustainable clothing, as it tends to be more expensive. On a global scale, could this same mentality cause wealthier nations to put a larger blame, regarding the environmental problems, on poorer nations where less people can afford to choose sustainable?

A rebound effect that could happen is that a brand provide the requested information,

but their popularity drop. If they had not provided the information, they would not show up in the filter, so providing the information gives strictly more exposure. Hence, if their popularity falls, it is because people actually use the filter and care about the rating. If this is the case, the decrease in popularity of said brand is a product of people's awareness regarding sustainability. If anything this strongly implies that our solution has worked, and that it strongly encourages brands to focus on sustainability to have a continuous success.

There is also a scenario where the retailer earn less money after the implementation of our service. If the focus of shopping shifts from price to sustainability, people might reconsider and not go through with a lot of purchases. If this leads to a decrease in profit for the retailer, they might want to opt out of our solution. This might put them in a situation where they lose economically by keeping the filter. On the other hand, they might lose branding by removing it, as it might put them in a bad light of the society, sending a signal that they prioritize money above the environment. This might be a difficult decision for the retailer, but a good situation for the environment. If the public is made aware of the retailers dilemma, the retailers keeping the filter might be even higher praised for looking like they value the environment that much.

It is also the case that someone inevitably will try to abuse the system in some way to save or gain money. Either by providing false or fake information, or by finding some sort of loophole. The loopholes can hopefully be fixed as soon as they are found, and if providing the wrong information becomes a big problem, it might be necessary to establish a control-entity to confirm that everyone are honest.

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Link to results from survey mentioned on page 5:
http://bit.ly/group2survey

Appendix 1

Figure 1: The diagram shows the result when asking people what labels/ certifications they were familiar with. The red columns marks the labels concerning textile/ materials.

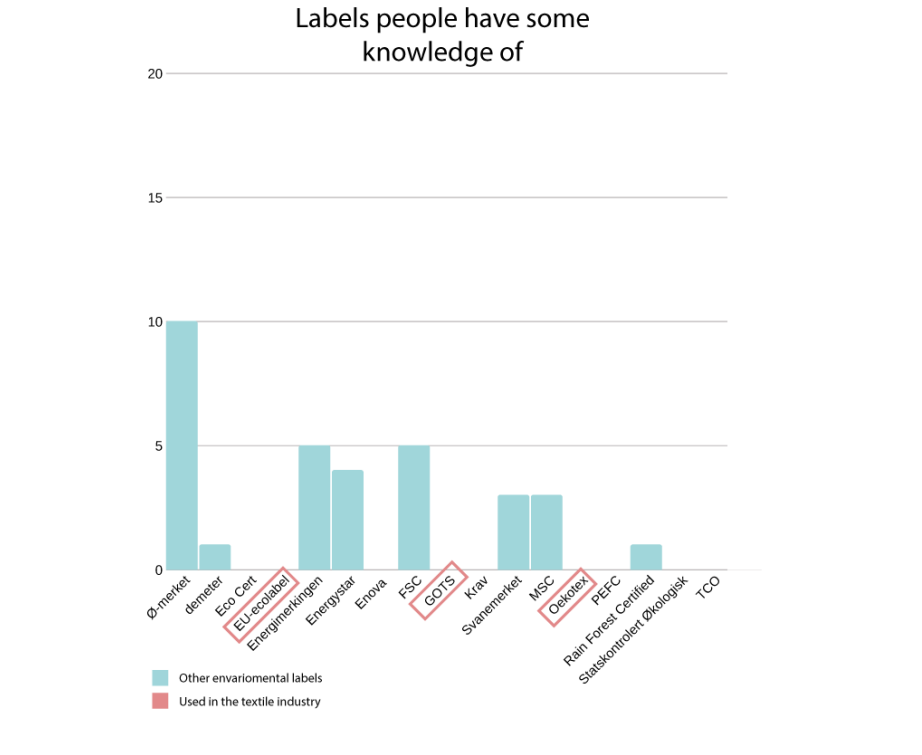

Figure 2: The diagram shows the result when asking people what labels/ certifications they had some knowledge about. The red squares marks the labels concerning textile/ materials.

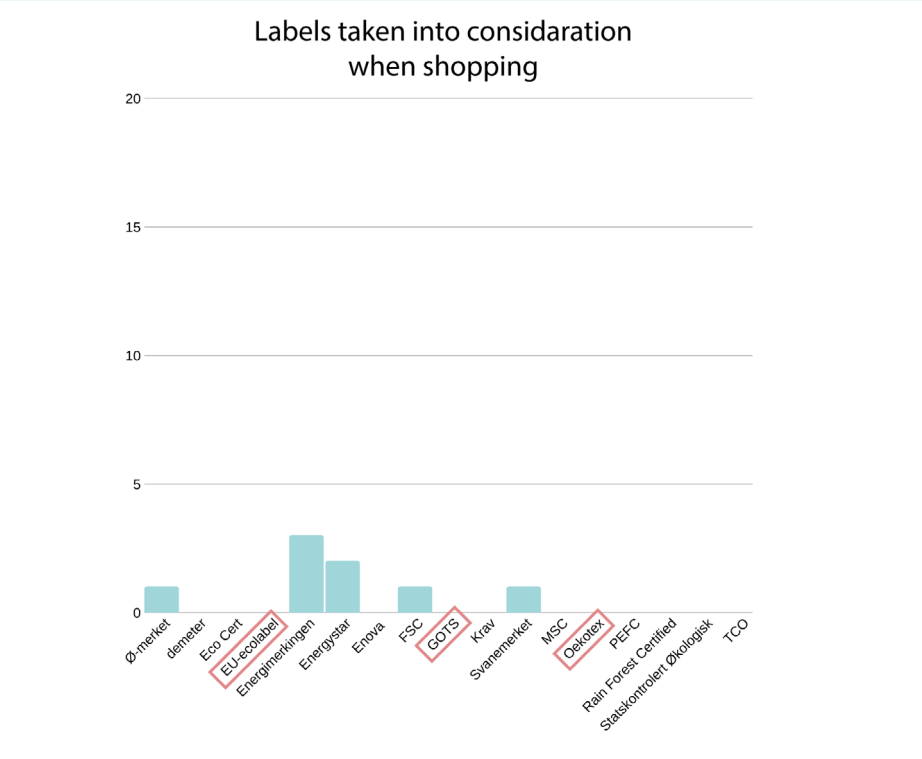

Figure 3: The diagram shows the result when asking people what labels/ certifications they take into consideration when shopping. The red squares marks the labels concerning textile/ materials.

Survey used to determine the categories

Bærekraftig shopping

Heidu!

Hva er "Bærekraftig-shopping" for deg?
Hva ser du etter når du kjøper noe "bærekraftig"?
(merk med strek (|) ved aktuelle kategorier)

Bruk av miljøvennlige materialer	
Redusert bruk av skumle kjemikaljer	
Redusert vannforbruk	
Redusert mengde avfall	
Økt resirkulerbarhet	
Lav energibruk gjennom produksjonen	
Rimelige arbeidsforhold og lønning for arbeidere	
Økologisk produsert	
Optimalisert materialbruk (eks. kjøtt og lær fra kyr)	
Annet:	

Results from survey

Bruk av miljøvennlige materialer	36
Redusert bruk av skumle kjemikaljer	13
Redusert vannforbruk	14
Redusert mengde avfall	32
Økt resirkulerbarhet	30
Lav energibruk gjennom produksjonen	12
Rimelige arbeidsforhold og lønning for arbeidere	26
Økologisk produsert	9
Optimalisert materialbruk (eks. kjøtt og lær fra kyr)	15
Annet:	13

Appendix 2 - Interviews

Helly Hansen
Contacted 28.03.19 & 04.04.19
Contacts:
Magne Halvorsen, sales strategy
Rebecca Johansson, marketing and PR

Magne Halvorsen

Being a brand of Norwegian heritage, Helly Hansen believes in the Norwegian values. For a long time this has been quality, knowledge and security. We are absolutely aware the impact the industry we are a part of has on the environment, and we see what people are actually buy.

My job is not only to sell our products to our partners, but also sell the right products to the right partners. In areas we know certain products sell better than others given some reason, we go about it in two ways; analyzing why the situation is like this, and how to do something about it. This applies to both physical and web-based stores.

The solution may be as simple as “the store is not marketing the products good enough” or “the merchants does not know how to sell some products over others”. These are the easy situations. The harder are the ones where the product is not what the customer wants. This can be of several reasons, and [as I mentioned], the production and ethics can be part of this.

Rebecca Johansson (after talking to Magne)

Helly Hansen is seeing how excessive usage of materials is impacting the climate, and we are currently doing efforts and projects to battle this.

In Oslo, the local division is at this moment working at strategy where recycling of sheep wool is in the focus. This is a project in cooperation with another firm who specializes in segregating wool from other materials (for example cotton). This project is currently under internal testing, but we are soon launching it for the general public. The goal is to use this technique to reuse our own and others products to make new ones, and [after asking about documentation] gathering detailed data from this is in the center of this. This data is mostly used for internal development, but these products will of course be branded and marketed appropriately.

Work Wear Helly Hansen
Contacted 27.04.19
Contact: Harald Johansen, production and quality

Harald Johansen

[Work Wear is a division within Helly Hansen, specializing in clothes and equipment for labor-based jobs.]

We sell tools for people to do their jobs. If these tools do not work properly, then the the labourers cannot do their job. We take this very seriously, and if any defects in our products are found, this is recorded and the cause has to be found. This means we are monitoring many, if not all, parts of the production; from the first thread is sewn to the customer is wearing it. This includes transportation, materials, manufacturing and more.

This is a relatively new approach for us. If you’d asked us 5 or so years ago this would not be the case. We had some quality issues with our products, and the only way to find the cause was backtracking it as far as we could go. This developed to stricter quality control at many of

the steps.
Of course, gathering all this information is not free. I cannot really tell you where this cost is paid off (most likely by the end customer), but one could look at this as a "quality assurance", both for us and the costumer.

This system started at the Work Wear Division, and has since worked its way to other parts of Helly Hansen. [After asking if the information is mostly the same.] I don't know, but I reckon the differences are not that huge. We are under the same company, and the guys at the top wants to see results, and we (at Work Ware) have found that this system satisfies that need.

Alfa

Contected 15.04.19
Contacts:
Eirk Avtjern, sales and partner relations
Ingrid Brandth, product development and design

Eirik Avtjern

ALFA is a brand with years of experience from the business of making high quality shoes to the conscious buyer. Our business started in 1931, and throughout the years we have provided footwear for every occasion; from school teams' cross-country skiing competitions, to daring adventures. From the start, our products have been made from the best overall material. In 1931, this material was leather. Today, it is still leather, but it hasn't been always been like this.

ALFA has changed with the times, and so has our products and production methods. When plastic was a thing, we made shoes out of plastics. When hybrid- and synthetic materials were new and exciting, your products adapted to these too. The thing is; our customers see through this. The products with other materials did not sell well, they were of a lower quality and the product didn't "grow" with the user. That lead us to doubling down on leather. ALFA prides itself with only using leather from cows that is already raised for other purposes. For each shoe, we can go back and see where the leather originated.

Ingrid Brandth

I am a product designer at ALFA, meaning I design how the shoes look, function and it is made. We are 3 people working with product development within ALFA, and we are all designing the products to meet the company's goals and requirements.

ALFA prides itself with having really close relationships with our suppliers and manufacturers. The leather is harvested from cows in Germany and Italy, and is then sent to several production facilities in Europe for dying, cutting and sewing. The design team is frequently sent to the facilities to observe the the production to see how we can make the products better. If we can save material somewhere, we go the great lengths to do it. For every shoe we develop, we have a system where we document all components, materials and manufacturing information. This is mostly for internal use, but has also been used to answer specific questions from customers. If we want numbers, we can get them. This is everything from how long cows are transported from place to place, how much water goes in the dye, how many meters of cotton used to sew the shoe.

[Why do ALFA collect this information. Is it because of a marketing advantage, or for your own sake?]

Both. It is not directly profitable to do this, but as a company ALFA is concerned with the environment and animal welfare. Our shoes

are made to last a small lifetime, meaning we rarely get the the same customer twice within 5 years. This means we have double to down on transparency and quality to sell to more people.

[Do you believe you are alone in this?]

We believe that we are at the forefront in Norway, but not globally, Patagonia owns that crown. We began this strategy around 6 years ago, and since then we gathered a healthy database containing information about around 63 models and over 200 000 pairs of shoes. We can see that other companies in Norway have adopted similar strategies in recent years, and we are gladly sharing our knowledge of gathering and storing data. If your company is not in on this, you are really out.