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Baltic2Hand

– Transforming the Second-Hand Market for a Sustainable Future

Content

Introduction

The challenge owner of this assignment is Baltic2Hand, a secondhand textile project running in 2023-2026. The project is implemented by Turku University of Applied Sciences, Laurea University of Applied Sciences, Latvian Chamber of Commerce and Industry, Tallinn Business Incubators Foundation and Sustainability InnoCenter. In the project, fashion and textile organisations from Finland, Sweden, Estonia and Latvia will pilot solutions related to secondhand textiles. The aim is to reduce textile waste and improve textile reuse by creating new business models, as well as develop the sustainability and circular economy competences of the organisations. Service design is used in the project as an approach to find and design new opportunities. The challenge Baltic2Hand presented to the team behind this report was to map out textile streams both globally and in and out from Finland, and to find out which organisations, businesses or people work in reuse textile field in different collecting, sorting and selling functions.

Based on this information, the team was assigned to figure out what are the risks and challenges related to the reuse of textiles and possibly create solutions for them. For Baltic2Hand, the important thing was to get a different point of view and new information and ideas. For the team, the goal was to get to understand the textile industry and its challenges.

The team consists of five people who all have in common the interest towards sustainability that they are all studying at different universities in Finland. They have varied backgrounds and competences which complement each other.

Unna Ahokas holds a master's degree in international business and entrepreneurship. She works as a Business Advisor helping Finnish companies with growth and internationalization. Her competences are in business management, innovation development and international markets. The skills she compliments her team with are organizational and problem-solving skills and content creation.

Yining Deng holds a master's degree in transportation engineering. She works as a patent agent helping inventors with international patent applications and innovation searching. She has working experience in the patent field in China and Finland. She specializes in resource searching. She provides the team with a broader perspective through her knowledge of the Asia-Pacific markets.

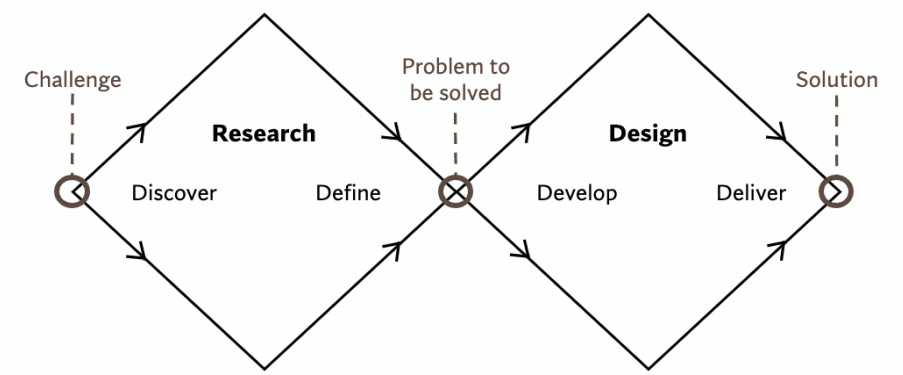
Elina Fast works as an expert in a state-owned sustainable development company. She has many years of experience in projects (e.g. related to the circular economy) and various clients, such as ministries, industry associations and companies. Elina complements the team with knowledge of the circular economy field, project expertise and putting things into practice.

Ninja Fedy is an experienced service and circular designer with a background in marketing and international business development. Ninja has developed solutions for business challenges in areas such as retail, health, e-commerce and construction and worked with many kinds of organizations, including NGOs, public organizations, startups and multinational corporations.

Ari-Pekka Santala has a strong senior level background in the food industry. Role in the key tasks of sales management has given him a wide understanding of different perspectives of business as well as knowledge of Finland`s largest grocery retailers. He provides the team with financial perspectives of business, supply chain management and shopper behavior insights.

1 Approach

As a framework for solutions for the challenge provided by the challenge owner Baltic2Hand, we used the Double Diamond process (picture 1).



Picture 1. The Double Diamond framework used in the assignment (modified from Danish Design Council, 2003)

During the initial Discover phase, we decided to first get a preliminary comprehension of the topic by looking into the research material suggested by the client and got to know the Baltic2Hand project as well as the research findings by the project so far. After this, we chose five main themes to research more closely individually: 1) textile streams globally, 2) textile streams in Finland, 3) textile value chains in Finland, 4) textile supply chains in Finland, and 5) the textile industry in Finland as a whole. This approach ensured that we moved forward with a well-rounded understanding of the problem allowing us to effectively address the needs identified through our collective research. Drafts were created, discussed, and revised in iterative cycles, incorporating feedback from all authors and our course mentor to ensure clarity and coherence. The research in the Discovery stage focused on secondary data collected by the authors in a desktop study. The research was relatively wide, and a lot of data was collected, which can be found in the appendices of this document.

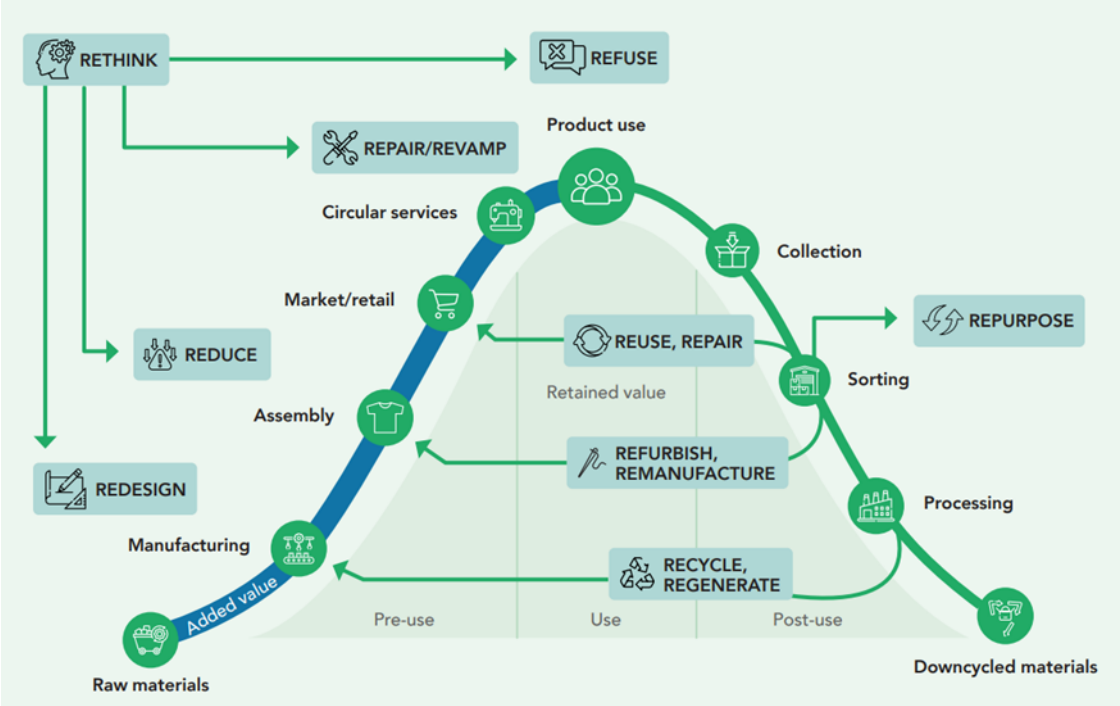
Transitioning into the Define phase, we organized a co-creative design session in Miro combining both a problem definition and ideation part. First, we synthesized and went through together all the information collected during the Discover phase to clearly outline the scope and objectives of our report. This step involved refining our topic and agreeing on the questions our report needed to answer. By defining the problem to be solved properly, in the form of a “How might we...?” question, we established a focused

direction for the deliverables. As we entered the Develop phase in the co-creation session, we first brainstormed ideas based on the ideation question: “How might we change the current business model of reuse textile sellers from linear to circular model to bring new / more profitable business for all parties involved?”. Then, we first voted on the most innovative and concrete ideas, and finally discussed, refined and made the chosen ideas more concrete.

In the final Deliver phase, we refined the previously chosen ideas during an online meeting and developed them further into this report, ensuring that each one was comprehensive enough for the challenge owner to take further. In addition to this report, we crystallized the findings into a presentation to be given in the end webinar and wrote a blog post about them.

2 Results of the research

In transitioning towards a sustainable circular economy, the textile industry embraces a comprehensive framework that reimagines the lifecycle of its products.



Picture 2. Circular Textile Value Hill Framework

Picture 2 shows the Circular Textile Value Hill Framework (GreenCape, 2023). It depicts a loop that represents the lifecycle of textiles from raw materials to manufacturing, then onto market/retail, followed by the use phase and finally post-use where the materials can be collected, sorted, processed, and turned into downcycled materials, thus closing the loop. The added value of the product is maintained as long as possible through reuse, repair, and refurbishment before recycling and repurposing. In addition, upcycling is an important method of circular textile, it refers to the creative process of transforming unwanted textile items into higher-value products.

Initially, it requires a rethinking of the production and consumption paradigm to prioritize waste minimization and design for circularity. Strategies include reducing the number of resources utilized, redesigning products for increased longevity, and encouraging consumers to refuse non-sustainable options. Post-production, the emphasis shifts to extending the lifespan of textiles through repair, reuse, and

revamping services, maintaining the value of materials for as long as possible. When items reach the end of their usable life, refurbishing, remanufacturing, and recycling processes regenerate them into new textiles, while non-recyclable materials are creatively repurposed. This recycling approach is supported by recycling services, which promote a regenerative model rather than the traditional linear "take-away-make-discard" model.

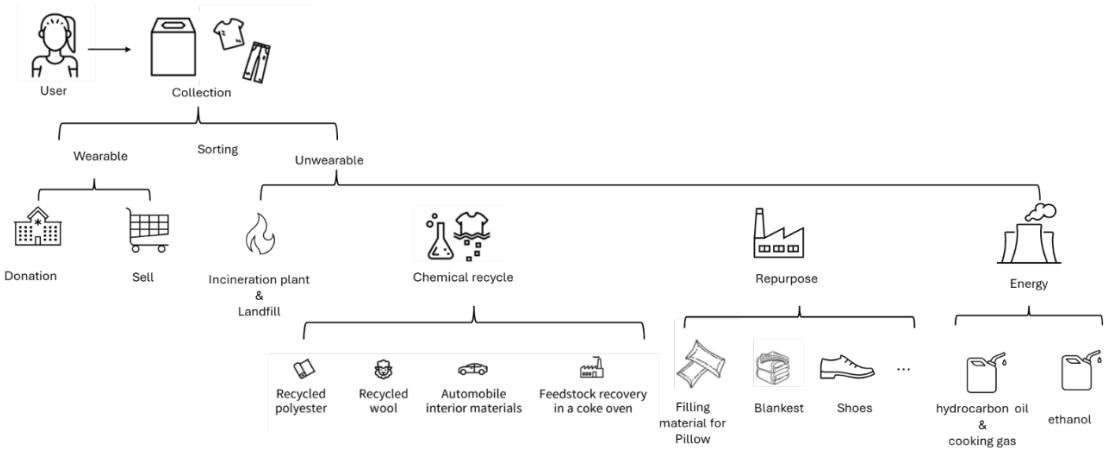
Building on the principles of the circular economy in the textile industry, this report turns focus to the specific dynamics of textile streams on a global scale, as well as a concentrated examination of the flows within Finland. The report will explore the global macro trends in textile recycling and the specific developments in the Finnish market, focus on the value chain that defines the lifecycle of textiles in Finland, from production through to consumption. Additionally, the report will dissect the supply chain mechanisms prevalent in Finland, scrutinizing how materials, information, and finances move in alignment with the principles of sustainability and circularity. This report will reveal the strengths, opportunities, and challenges inherent in Finland's approach to integrating circular economy concepts within its textile industry, offering a microcosmic view of the potential for transformation in the global context.

2.1 Textile streams globally

The global flow of second-hand textiles predominantly sees exports from Europe to continents like Africa and Asia (Kamal, 2023). In 2021, the United States emerged as a leading exporter of second-hand clothing, with a notable export volume of 700,000 tons. Most of these exports from the US were destined for Africa and Latin America (UNECE, 2023). In Africa, used textiles mainly serve local reuse due to the demand for affordable European clothing, while in Asia, these textiles are often sorted, processed, downcycled, or even re-exported for recycling or reuse elsewhere (Lam, 2022). Textiles that are not suitable for recycling often end up as waste in landfills.

Picture 3 illustrates the lifecycle of second-hand textiles, highlighting the various pathways these materials take after being discarded by the user. Upon collection, textiles are sorted into two categories: wearable and unwearable. Wearable items can be donated or sold, continuing their lifecycle as clothing. Unwearable textiles are directed to different fates: they can either be sent to an incineration plant and landfill,

chemically recycled into new materials, repurposed into different products, or used for energy recovery.



Picture 3. Textile recycling chain globally (modified from Rewoven, 2024 and JEPLAN, 2020)

The chemical recycling process transforms unwearable textiles into new materials, such as recycled polyester and wool, which can be used to create products like automobile interior materials. Alternatively, feedstock recovery in a coke oven is another option for repurposing textiles, indicating the recovery of raw materials.

Some new technologies are being utilized for textile recycling. The Green Machine, developed by The Hong Kong Research Institute of Textiles and Apparel (HKRITA) in partnership with the H&M Foundation, represents a significant innovation in textile recycling technology. This system uses a hydrothermal treatment to recycle blend textiles, specifically cotton and polyester blends, without quality loss. The process involves decomposing the cotton component into cellulose powders, which enables the polyester fibers to be separated and reclaimed. These recovered polyester fibers can then be reused to produce new textile products (Igini, 2023).

For textiles that are repurposed, the picture shows a variety of new uses, from filling material for pillows to making blankets and shoes (Rewoven, 2024). This step prevents waste by giving new life to materials that would otherwise be discarded.

Some textiles are converted into energy sources. The picture lists hydrocarbon oil, cooking gas, and ethanol as potential outputs of this conversion process (JEPLAN, 2020). These byproducts can be used as alternative energy sources, contributing to a reduction in waste and the promotion of sustainable practices in energy production.

2.2 Supply chain for used clothing in Finland

In Finland, approximately 13 kilos of textiles are removed from use per inhabitant each year (Suomen Tekstiili ja Muoti, 2024). The number is similar compared to other Europeans (STT info, 2023).

In the used clothing supply chain, there are several actors who receive textiles. The condition of the clothes determines where the textile should be sorted and where they end up.

Used clothes can be divided into three categories:

1. Reuse: usable clothes (good condition, intact and clean)
2. Collection of waste textiles: broken clothes
3. Mixed waste collection: spoiled (moldy and smelly) clothes and underwear.

2.2.1 Reuse

Clothes in good condition should always be reused in the first place, so that they remain in their original purpose for as long as possible. There are several ways for consumers to supply clothes to reuse:

- Consumer-to-consumer commerce, e.g. brick and mortar flea markets, local flea market events and online marketplaces (Facebook groups, Tori.fi, Huuto.net etc.).
- Secondhand clothing online stores, e.g. Emmy (clothes can be delivered as a postal package or in collection containers, which can be found in the biggest cities around Finland), Vähänkäytetty (delivery by postal package) and Vinted (delivery by postal package).
- Charities, e.g. Red Cross, UFF, Fida and Salvation Army.
- Several clothing stores accept used clothes for resale.

The trend is that buying second hand is increasing. It is estimated that in 10 years, 20 % of consumers' clothes will be bought second hand (Emmy.fi). At the moment a third (29 %) of discarded clothes are donated to charity in Finland (STT info, 2023).

2.2.2 Collection of waste textiles

Reusing the clothes is always the primary option, but if the clothes are no longer in reusable condition, they can be recycled into raw material. Broken or otherwise unusable textiles can be taken to final textile collection. According to the waste regulation in force in Finland, the municipality must organize the regional reception of household textile waste from the beginning of 2023 (Valtioneuvoston asetus, 978/2021).

There are 31 waste areas owned by municipalities in Finland, and their operational area covers almost whole of Finland. There are currently around 307 recycling points (Voima.fi, 2024). The nearest collection point for waste textiles can be found at www.kierratys.info.

The municipal waste centers sort and pack the collected textiles. After that, they are transported to Lounais-Suomen Jätehuolto, a waste management company in Turku, for further processing. Material identification is an essential part of the supply chain related to waste textiles as well as logistics.

Some of the waste textiles collected from households are processed into recycled fiber, which is used as raw material for new products. Some of the discarded textiles end up as orders for companies that use it in the manufacture of their own products. The textile that goes into reuse is mainly sorted by hand, which makes the recycled raw material expensive. So far, there is no technology available that would be able to separate and sort consumer textiles as such (LAB Focus, 2022). The challenge related to sorting is partly incomplete or incorrect information about the material used in the garment.

At the moment about 18 percent of clothes end up in waste textile collection (STT info, 2023). The upcoming EU waste directive may change the division of responsibility for the collection of waste textiles in the coming years. According to the EU directive, the collection of waste textiles will probably be transferred to textile producers, such as manufacturers and importers. This means that producers will be responsible for the recycling of discarded textiles in the future. The Commission's proposal would practically mean that the responsibility for the separate collection of household textiles and waste management would be transferred from the municipalities to the producers (Suomen Tekstiili ja Muoti, 2023).

2.2.3 Mixed waste collection

Although there are many opportunities to reuse clothes, still every fifth (20%) discarded clothing is thrown into mixed waste to be burned (STT info, 2023). Only dirty, moldy and wet clothes as well as socks and underwear are mixed waste. All other clothes should be sorted primarily for reuse or secondarily as disposal textiles.

The residential waste is taken care of by the municipality, which has given the task to regional waste management companies (Ympäristö.fi). Mixed waste is transported to a waste power plant for incineration. The energy generated from combustion is used in the production of electricity and heat.

2.3 Value Chain in Finland

After collection, textiles obtained from households that are not usable as such, i.e. textile waste, are taken to a processing plant, where the textiles are converted into recycled textile fibers. The first processing plant in Finland has been built in Paimio by Rester Oy, and the premises are also used by the leased Lounais-Suomen jätehuolto Oy. (Piipponen 2023).

The use of recycled and novel bio-based textile fibers will enhance the competitiveness of apparel and technical textiles. Finland has world-class understanding on the use of biomass for value-added textile fibers, for the development of technologies to produce cellulose based textile fibers, and circular economy solutions from mechanical recycling to chemical recycling of cellulosic materials. Emerging manufacturing technologies for cellulosic textile fibers in Finland are Spinnova, Infinited Fiber Company and Metsä Spring. (Helsinki-Uusimaa Regional Council 2022).

There are several Finnish companies making products which are made from recycled and upcycled fibers. Pure Waste manufactures threads, fabrics and clothes from 100 percent recycled material. Univisio manufactures bed textiles - such as blankets, pillows and sheets. Univisio's products have long used polyester fiber and fabric made from recycled, clean PET bottles, but now the company is also investigating recycling its own side streams into new products. Dafecor Oy manufactures various nonwoven products from recycled fiber for, for example, industrial maintenance, construction, and

environmental damage repair or prevention. The product range includes e.g. oil naming mats, industrial towels, parquet underlay felt and insulation products.

Finnish technical textiles, especially nonwovens for hygiene and wipes, are expected to have steady growth and an export potential of 300 M€ in 2035. Novel wood-based fibers and recycled fibers are expected to have increased export potential in 2035. The growth will start after 2025. Additionally in 2035, Finnish export potential is strongly based on machinery and automation solutions, and possibly also in chemicals for textile recycling. (Helsinki-Uusimaa Regional Council 2022).

2.4 Overview of second-hand textile organizations in Finland

Many kinds of organizations and people work with collecting, sorting and selling in the reuse textile field. This involves a variety of settings and methods specified under the following sub-chapters. Additional materials collected during the research phase can be found in appendix 5.

2.4.1 Overview of second-hand textile sales organizations in Finland

Consumer-to-consumer commerce is common in the field of reuse textile sales meaning that regular people sell directly to other people in physical places like flea markets or through special events organized for selling used goods or on online social platforms like Facebook groups or online marketplaces like Tori (tori.fi). (Yle, 2022)

Then there are online stores specialized in second-hand clothing, such as Emmy (emmy.fi), where consumers can buy clothes and have them delivered as a postal package. Other similar online stores include Vähänkäytetty (vahankaytetty.fi) and Vinted (vinted.fi), which also send purchased second-hand textile items through the mail. A website by Kathrin Deter provides a good overview of different organizations in the second-hand textile sales in Finland and an interactive map for second-hand shops in Helsinki (Deter, 2024).

Charities like the Red Cross, UFF, Fida, and the Salvation Army have long been involved in the second-hand textile retail game. They collect donated clothes with collection containers or in physical stores and sell them to fund their charitable activities. There is also an increasing number of second-hand clothing stores where

people can bring their used clothes, book a spot to hang them and let the store take care of the sales process for them as a service. An example of this is Moody Monday with stores in some of the biggest malls in Finland (Moody Monday, 2024). Moreover, some regular clothing stores have begun to accept used clothes to resell (Yle, 2023) and there's even a second-hand textile shop at the airport of Helsinki-Vantaa (Finavia, 2024).

2.4.2 Material sourcing and sorting of second-hand textile organizations

So where do Finnish second-hand textile resellers get their material from? The sourcing method depends largely on the business model of the second-hand reseller. Some prioritize donations for their social and environmental impact, while others focus on purchasing directly to curate a specific selection of goods. Organizations like UFF and Fida rely heavily on donations from individuals. They operate clothing collection services that make it easy for people to donate their used clothes, mainly through their own collection containers. These organisation usually take care of the collection and sorting by themselves. The donations to Fida, for example, are sorted either in Fida's sorting facility in Helsinki or locally in Fida secondhand shops outside the capital region. According to Fida, the organization sorts around 1.5 million kilos of clothes per year. (Fida, 2024)

Many second-hand online stores purchase items directly from individuals through buy-back programs where the store assesses the value of the item and buys it from the owner, or through consignment, where the item is sold on behalf of the owner and the profits are shared. For example, Emmy's business model is based on the latter and the company makes the item owners do a preselection of clothes based on certain brands and encourages them to only send certain clothes during certain seasons (Emmy, 2024). Some second-hand stores may also purchase overstock or unsold inventory from traditional retailers or brands looking to offload last season's items in a responsible manner; an example of a business-to-business marketplace of overstock sales is Stocklear (stocklear.eu). In addition, vintage dealers often acquire items from estate sales and auctions, where they can find unique and rare items to add to their collections.

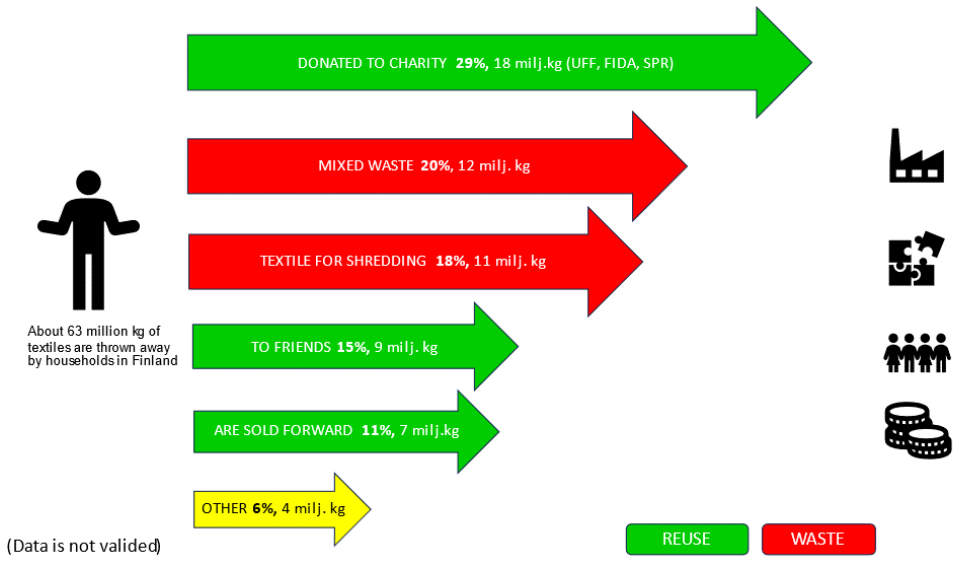
2.5 Streams in Finland

In this chapter the intention is to look at the bigger picture and examine the textile reuse structure in Finland on a theoretical level from a financial point of view. Calculations are based on real numbers but those have not been validated or do not include a deeper analysis.

Every year about 63 million kilograms of textiles is thrown away by households in Finland (Dahlbo, Rautiainen et al. 2019). The total amount varies depending on the source of the information.

Household's disposable textiles end up in different streams (picture 4):

- 29 % donated to charity like UFF, Fida and SPR
- 20 % goes to mixed waste -> energy material
- 18 % textiles for shredding
- 15 % given to friends
- 11 % are sold forward
- 6 % other



Picture 4. Household's disposable textiles streams in Finland (STT, 2023)

In this case the focus is on the streams of charity and resale because the cash flow of these operators and companies mainly comes from the reused textiles and the main business is dependent on it.

Donating to charity is the biggest stream in Finland. It includes operators like UFF, Frida, Punainen risti and Pelastusarmeija. The calculated turnover of these operators (excluding UFF because of its big size) was about 20,5 million € in 2014 (Tapiola 2014). Turnover might be affected by other reuse material like furniture but still it can be said that the value of business is only 1-2 € per kg, when comparing the year 2022 when these three operators collected 9,2 million kg of disposable textiles (multiple sources listed below). Based on the collected data, conclusion would be that this kind of business model works as long as volume stays high, the raw material is free and there is enough of it available.

Conclusion of selling forward (by yourself or via reseller) stream is quite different. Research includes 14 Finnish or other well-known second-hand companies from different business models and looked into their finance side of business (picture 5). Finance data sources have been used by public information from Finder, Kauppalehti or Google (Finder, Kauppalehti 2024). These companies are divided into three business types: Net stores (n=6), Mobile platforms (n=4) and Physical / flea markets (n=4).

When examining middle and large companies of Net stores and Mobile platforms, the findings are interesting. Generally, one can say that all the companies were heavily unprofitable. It is not possible to say for sure what is behind the numbers, but since these companies have also been operating for several years, individual investments do not explain the result.

MOBILE PLATFORMS	GSV milj.€	EBIT milj.€	year
Zadaa	1,6	-2,1	2021
Tori.fi	36,1	-1,4	2022
Vinted	371,4	-47,1	2022
Vesitaire Collective	562	54	
Face Book groups			

NET STORES	GSV milj.€	EBIT milj.€	year
Emmy	4	-1	2022
Rekki (stopped)	0,6	-0,45	2021
Vähänkäytetty.fi	2,5	-0,64	2021
Vau Second Hand	0,3	-0,11	2023
Sellpy (H&M)	no data	no data	
Radhica	no data	no data	
Aina2Hand	0,023	0	2022
Ninyes	0,095	-0,265	2022

Picture 5. Collected financial data of mobile platforms and net store companies

One can assume that the operating profit is weighed down by the strong labor intensity (sorting, repairing, cleaning etc.) and above all, expensive prices for the resale products. When a consumer sells the product to an online store, he gets good compensation for the used clothing, but the retailer's profit margin is too low to be able to cover the costs of the heavy operation. In addition, the price of the reused product quickly rises so high that it might not support second-hand shopping behavior.

On the other hand, volume matters. This can be stated by looking at small, private second-hand entrepreneurs or flea markets where the result can be slightly positive, but the volume is so low that it can barely pay the entrepreneur's salary (picture 6).

Physical store & flea market*	GSV milj.€	EBIT milj.€	year	Ps*	Fm*
Niin Mua	0,15	no data		X	X
Tacci Second Hand	0,03	0,002	2023	X	X
Relove	0,003	0	2022	X	X
Dirty Hippies	0,06	-0,006	2023	X	X
Merkitys 2nd Hand Shop	no data	no data		X	
Taika Second Hand Shop	0,228	0,007	2022	X	
Lively (stopped)	no data	no data		X	

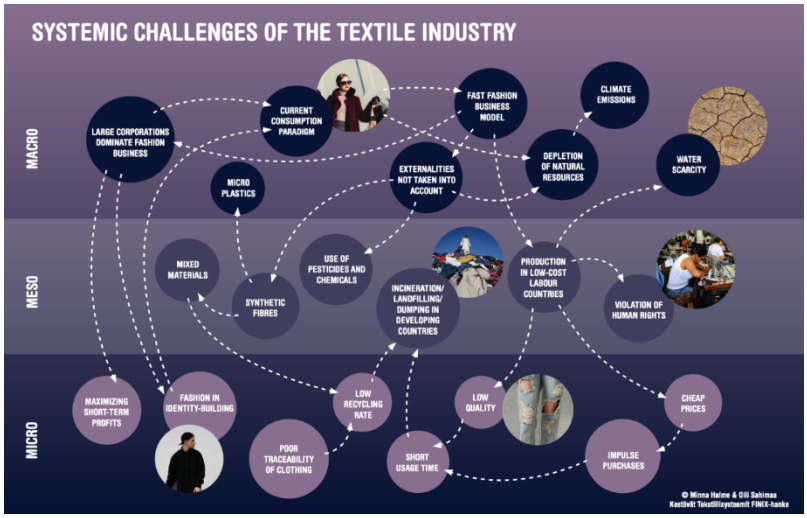
Picture 6. Collected financial data of physical stores and flea markets

In summary, it can be said that Finland’s reuse business is in a very vulnerable position. The entire structure is in danger of losing its ability to function if new business model solutions are not found. If the business looks like this financially, it will not attract investors or new entrepreneurs to join the business. Reuse business has a lot of unused potential, which charity alone cannot exploit. That is why it is important to find new business models and support existing ones to find new ways of working to improve profitability.

3 Risks and Challenges

The second-hand textile market in Finland faces a significant challenge as rising operational costs outstrip the slim profit margins inherent in the sector, leaving the market vulnerable. While consumers may receive fair compensation for their used garments, retailers find it difficult to achieve financial sustainability due to the high expenses tied to logistics, cleaning, and sorting. Moreover, the increasing prices of reused goods threaten to erode the affordability appeal of second-hand shopping, deterring consumers and shrinking the customer base. Small-scale operators, like private second-hand entrepreneurs and flea markets, struggle to generate sufficient volume to be financially viable, leaving their operations just able to sustain wages but offering little growth opportunity.

In addition, picture 7 shows multiple different challenges in the textile industry. The current linear economy model has given possibility for the fast fashion business models to flourish, and thus contributing to problems like climate change, micro plastics and water scarcity. The production of low-quality clothes with cheap prices has had negative effects both on people and nature. The low recycling rate of clothes and the short time they are used have created massive amounts of waste that are not being handled in a productive way.



Picture 7. Systemic challenges of the textile industry (FINIX, 2020)

Based on picture 7 and triple bottom line of sustainability – social, environmental and economic - we also identified the following risks.

3.1 Social

Risks associated with collecting. The lack of clear responsibility in waste textile collection hampers effective recycling and reuse initiatives, causing valuable raw materials to go unused. For example, the Municipal Waste Center (HSY) of the capital region will not add new collection points for waste textiles, because the division of responsibility for collection is unclear in the future. It may take years for the directive to enter into force, and during this time valuable raw material will be wasted, instead of developing the separate collection of discarded textiles and finding new uses for the raw material. This situation limits community engagement in sustainable practices (Kiertotalous-Suomi, 2023).

3.2 Environmental

Risk of rising textile waste in mixed waste. Ineffective textile waste collection results in more textile waste ending up in mixed waste, leading to greater environmental pollution and missed opportunities for recycling. Finns' knowledge about clothes collection and where to sort discarded clothes varies greatly (STT info, 2023). More and more clothing waste that does not belong there ends up in mixed waste, if it is not known about the separate collection of discarded textiles or if sorting points are not added.

Risk of high cost for recycled textile. The high cost of recycling, driven by insufficient technology and expertise, makes recycled textiles too expensive and undesirable, which undermines the environmental potential of a circular economy. Developing new technology for sorting waste textiles is crucial to make recycled fibers more affordable and appealing, but it also necessitates skilled experts to properly identify the textiles.

3.3 Economic

The increase in second-hand shopping might not reduce the purchase of new clothes, limiting the financial benefits of reducing waste in the textile industry. While the trend of

buying second-hand is rising and it is estimated that in 10 years, 20% of consumers' clothes will be bought second-hand (Emmy.fi), studies show that buying used clothes is just one way of spending among others. Since second-hand buyers are not driven by sustainability concerns, buying second-hand does not necessarily reduce the purchase of new clothes. (Kaupan liiton kuluttajatutkimus, 2024)

Risk of policies threatening second-hand supply. If policies shift textile waste collection responsibilities to producers, it could significantly reduce the supply available to second-hand stores, threatening their economic viability. In addition, uncertainty around waste textile collection responsibilities and the delayed enforcement of directives makes investment in the sector risky, hindering profitability and market growth.

Consequently, the second-hand textile in Finland is at risk of losing its capacity to function effectively unless innovative business models are developed to enhance efficiency and profitability. The fragility of this market structure makes it unattractive to investors and new entrepreneurs, underscoring the importance of new strategies to unlock the industry's potential, rather than relying solely on charity.

4 The main challenge and solutions

As described in the approach section, we defined one main challenge to be solved: “How might we change the current business model of reuse textile sellers from linear to circular model to bring new / more profitable business for all parties involved? “

We chose this challenge because without these changes the entire reuse textile business cannot develop and remain viable.

4.1 Ideas with most concreteness

These are the ideas which we felt are the most concrete, meaning it is clear to see how they could be implemented. It does not mean that it would be easy, or that there wouldn’t have to be many steps in the way of making these ideas into reality. It is possible these are the type of ideas that have already been thought about many times, which makes them less innovative. Yet, it is possible that these solutions would have a great impact on increasing the reuse of clothes.

4.1.1 Cluster 1, Ecosystem of reuse textile sellers

- Ecosystem of reuse textile sellers
- More cooperation with different industries
- Cooperation with large clothing retailers (SOK, Tokmanni, Kekäle, Citymarket, etc.) might offer an opportunity for both parties. Nation-wide retailers have already a large flow of consumers and second hand would only be a very small part of their turnover, and therefore would not burden their business significantly.
- One should not do everything by themselves. In the current model, companies might consider outsourcing those functions that are not their core business or are so generic that those can be produced by a third-party company. In this case, a second-hand company could outsource, for example, cleaning services to specialized cleaning companies, to concentrate on their core competence and more profitable business areas
- Resellers (like Emmy) to partner up with all kinds of other players in the field

- For example, on Emmy's site you could buy other services: upcycling, repairing

4.1.2 Cluster 2, Taxation

- Taxation relief for reuse textile sellers. Supporting second-hand business with financial instruments. It is absurd that a consumer can sell second-hand products tax-free, for example, on Facebook, but it cannot be done if sold through a company or entrepreneur. For example, some kind of tax benefits might get bigger companies excited about this low-profitability business area or better guarantee a small entrepreneur's livelihood.
- Second-hand products tax-free
- More tax for new clothes

4.1.3 Cluster 3, Product design

- The clothes must be designed to be multi-purpose or for reuse.
- Hopefully, the new producer responsibility will promote textile recycling. The clothes that end up on the market would be long-lasting and the material would be easily recycled for reuse (Voima.fi, 2024). This requires that there is a clear operating model for producer responsibility.

4.2 Ideas with some innovativeness and concreteness

These ideas have both some innovativeness and some concreteness, which means they would need more refining in order to become more interesting.

- Raising awareness of textile recycling and materials
- A system where customers have all the value of the clothes
- Business of clothes of Airbnb, the renter has responsibility
- A reseller (like Emmy) could also sell kits with which people could themselves repair or upcycle those: these could come from well-known brands to increase the value of the original item. For example, Marimekko patches for a basic jeans jacket

- A reseller (like Emmy) could promote the idea of circularity: "use it for a while and then sell it again" -> this is about marketing but also for example by saving the information of the product on the customer's own page

4.3 Ideas with most innovativeness

These are the solutions we find the most innovative, which is why we wanted to dive deeper into developing them. They might be far from being able to implement right away, yet they hold power as they are something new and represent outside of the box thinking.

- **Every company would have a reuse part of their business, but it is all governed by one actor that is non-profitable.** The idea behind this solution is that to change the current linear economy, we need to get all the companies involved in circular economy. If we only have some circular economy –based companies and others are working in the “old” linear way, we will never move onto a completely circular economy-based world. Thus, in this model we propose that all the companies that sell clothes would have a part of their business based in a circular economy, for example taking back old clothes and selling or upcycling them. This way every company would benefit either financially or through customer loyalty in being a part of the circular economy ecosystem. There would be one big actor, for example state owned, which would help coordinate and give out information about the circular economy solutions. For example, they could provide an application for all the companies which they could use to handle their second-hand clothes. This way it would be familiar and easy for the customers to use the different companies’ offerings.
- **Take customers into the business, make them "owners" or "entrepreneurs"**. Currently, the customers are only seen as consumers, who buy and discard clothes. The companies just want to sell as many clothes as possible and the customers only think about the purchases in the moment, and thus often choose affordability over quality, or end up buying something they don’t need. In this model we are suggesting that the customers are somehow involved in the clothing business, either as part-owners in the companies or as entrepreneurs. Thus, they would have more of a stake in the industry and would also benefit from long-lasting clothes. Maybe they could have stock of

everything that they own and could see its value all the time. If the clothing items would also be tagged and their materials and information would be in their online stock, the customers could see all the time how many clothes and what type they have. This way they would invest more in quality and not buy clothes they don't need.

- **Buying reused textiles can get points on software, points could use as money to buy other things.** The idea is similar to a loyalty or rewards program, which incentivizes customers to buy reused or second-hand textiles by offering them points that can be redeemed for other purchases. This is similar system with K-Plussa system in Finland, which rewards customers with points for their purchases at participating stores. These points can then be used as a form of currency to buy additional items or receive discounts. When customers purchase reused or second-hand textiles from participating stores or platforms, they earn double points. The number of points might depend on the value of the purchase or could be part of promotional offers. Customers can redeem these points on future purchases, either within the same store or across a network of stores and services participating in the program. This might include buying more reused textiles or other products available on the network.

5 Conclusion

The streams of reused textiles are very diverse and complex. It is difficult to define one common structure around this line of business since it changes all the time. The only sure thing is that a consumer buys clothes, wears them for a certain period of time and discards them one way or another. We started by critically examining various streams of the reused textile and collected comprehensive background information. Data was carefully analyzed by the project team; the members of which have extensive know-how and competence accumulated from various fields. As a result, we were able to create an overall picture of the different parts of the value chain within the reused textile business.

The project was challenging but interesting at the same time. The biggest challenges were the limited research time and the quality of information available from the public internet sources. In addition, there was not much research information about the second-hand textile trade from an economic point of view. In conclusion, to obtain a reliable and validated research result, one should use more extensive data sources and spend more time interviewing people working in the business.

Findings from an economic point of view are a concrete indication of the current state of the reuse textile business. One major conclusion is that the traditional generally used linear business model will not be a solution in the reused textile trade since this model leads to economically unprofitable business. The field of selling reused textile is relatively young and economically small business in Finland. That is why it would be important to create new, functionally and commercially viable operating models, which would attract more consumers, investors and entrepreneurs to the field. We see that there is a huge potential in the reused textile business, but there needs to be changes made. The change is not done alone. However, to harness the potential, we would need new extensive business ecosystems, where the synergies of different sectors can be utilized, and the business of reused textile can be attractive and profitable for both consumers and companies.

The change should focus on three directions: 1) Efforts should be made to influence the Finnish government to remove the tax burdens which clearly are harmful for developing the field of business 2) Cooperation networks with large Finnish retail chains and other operators of the ecosystem, such as laundries and repair services,

should be created. 3) Initiatives should be undertaken to promote consumer marketing aimed at changing consumer behavior and creating more attractive options for consumers to sell and buy reused textiles, thereby utilizing the full potential of clothing for the circular economy.

Baltic2Hand is a pioneer and is doing a good job trying to make a change. However, to make a big-scale impact, more operators like Baltic2Hand are needed in the field. Together these operators can drive the change to improve the textile reuse business for every stakeholder.

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Appendices

Appendix 1: Textile streams globally

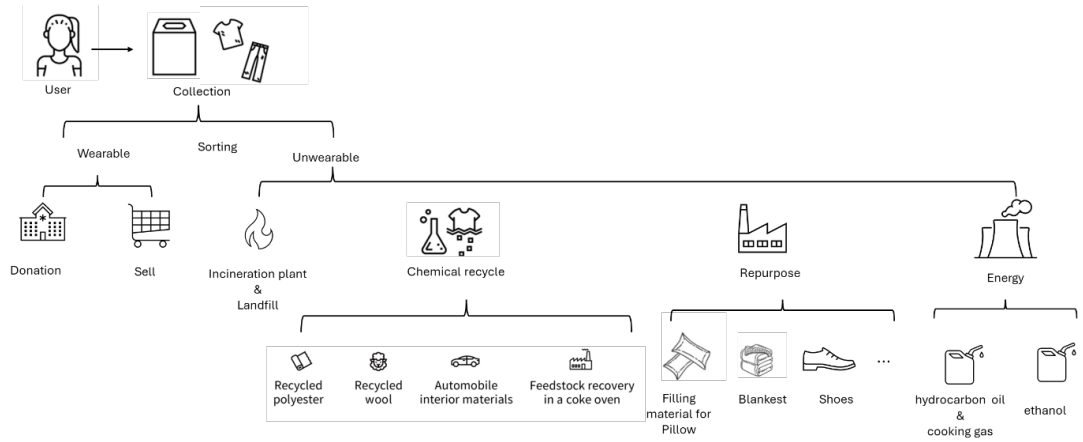
Appendix 2: Examples of textile reuse companies

Appendix 3: Additional material related to second-hand textile organizations in Finland

Appendix 4: Problem framing and ideation workshop contents

Appendix 1: Textile streams globally

1. Textile recycling chain around the world



2. Textile recycling of Nordic countries

The **Nordic region** export more than 70,000 tonnes of used textiles each year, with most thereof dispatched to **Eastern Europe** for sorting. There, the costs of handling be lower, and yon markets exist for certain textiles unfit for resale within the **Nordic region**. The greater part of the treated textiles are subsequently export forth again for further use and recycling in distant lands. **Estonia and Lithuania**, alongside **Poland, Bulgaria, and Germany**, stand as foremost destinations for the export of worn textiles from the **Nordic region**.

Nordisk Ministerråd - TemaNord2020-526 (norden.org)

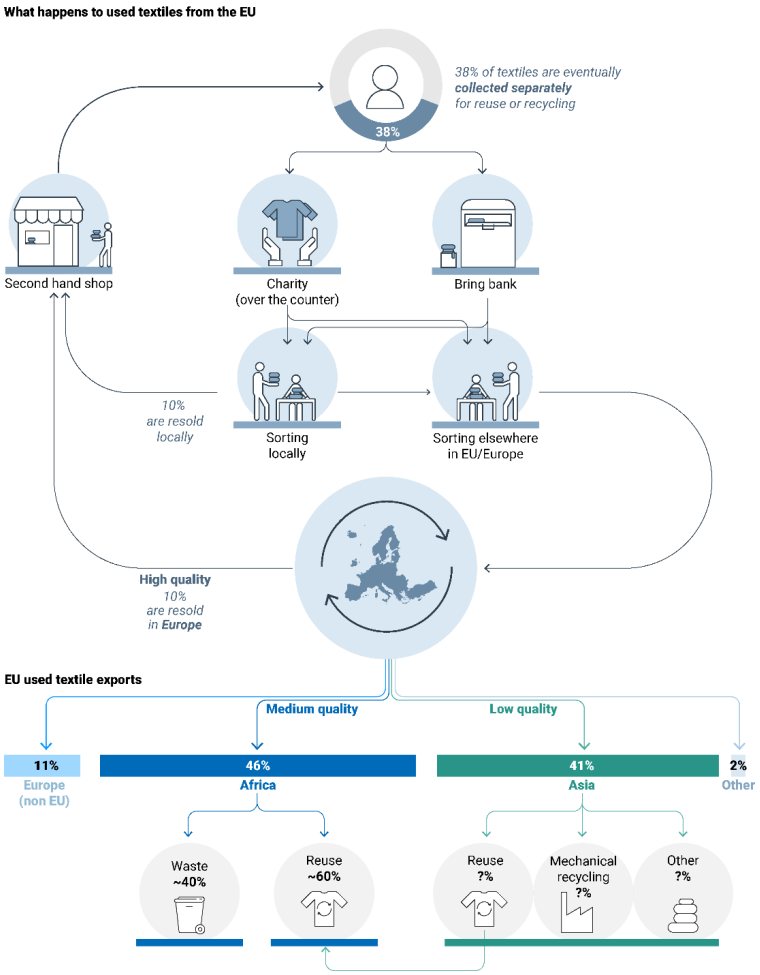
3. Data of Europe exportation

In 2019, 46% of used textiles exported to **Africa**. Imported, used textiles on this continent primarily **go towards local reuse** as there is a demand for cheap, used clothes from Europe. Textiles deemed **unsuitable for further use** predominantly find their resting place in **open landfills** and **informal waste pathways.**

In 2019, 41% of used textiles ended up **in Asia**. Most used textiles on this continent are **imported to dedicated economic zones** where they are sorted and processed. The **used textiles** are mostly **downcycled into industrial rags or filling or re-**

exported for recycling in **other Asian countries or for reuse in Africa**. Textiles that **cannot be recycled or re-exported** are likely to **end up in landfills**.

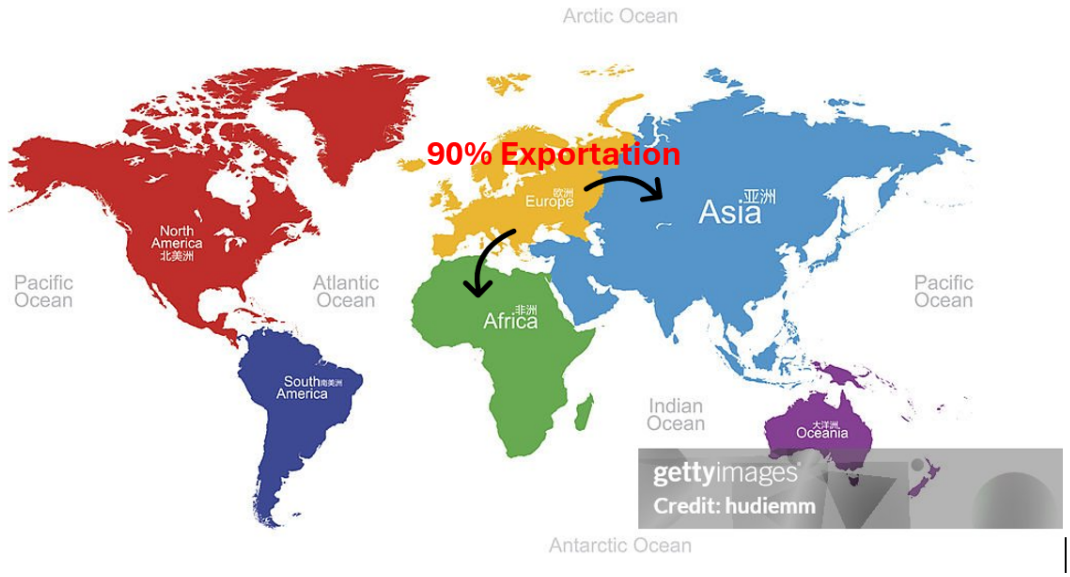
Indications that it might be related to the benefits of **specialization, economies of scale and the presence of harbors. Denmark, Finland and Sweden**, for instance, do not have significant wholesale/sorting capacity, whereas the **Netherlands and Poland** have a large wholesale and sorting sector (Köhler et al., 2021). **Germany** also does not have sufficient sorting capacity locally compared to what is collected, and in the **Netherlands**, most of the local sorting capacity is used to sort textiles from Germany (Fashion for Good, 2022). Furthermore, **Belgium, Italy and the Netherlands** have large export harbors. As sorting is a manual and labor-intensive process, it is more economical to do it in countries with lower labour costs, such **as Poland** (Fashion for Good, 2022).



[EU exports of used textiles in Europe's circular economy — European Environment Agency (europa.eu)]

4. The Asia Pacific region textile recycling market

The dimensions of the textile recycling market in the Asia Pacific region attained a value of US$ 1.8 Billion in the year 2023. Foreseeing the future, the International Market Analysis Research and Consulting Group (IMARC Group) expects that the market shall ascend to US$ 2.2 Billion by the year 2032, displaying a growth rate (CAGR) of 2.6% over the period spanning from 2024 to 2032. Country's specialty products are listed here.

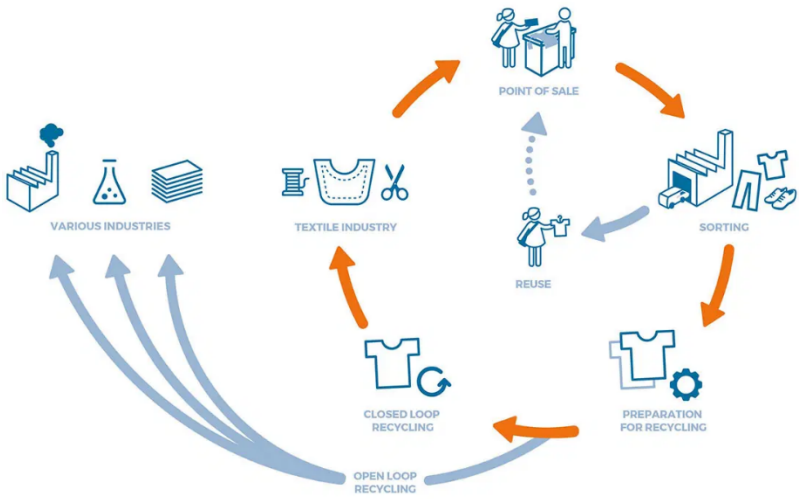


Examples from Singapore:

The recycled textiles often find their way *to communities with lower incomes*, where they may be **repurposed into raw materials or transformed into fabrics** like industrial cleaning cloths. Textile recycling typically involves three primary stages: collection, processing, and distribution. However, in **Singapore**, **there exists no textile recycling facility** on the island itself. Hence, most local companies engage **in collecting and distributing textiles**.

Local textile recycling companies **collect** the old clothing and fabric, then:

- **Donate** them to nursing homes, non- profit organisations, and lower-income groups,
- **Export** them to overseas markets to be **sold**,
- **Ship** them to a textile recycling plant overseas to be processed into raw materials, or
- Send them out as industrial cleaning cloths.



Four common methods of textile recycling: mechanical recycling, resale, upcycling, and downcycling.

Mechanical Recycling:

Mechanical recycling may be what many of us associate with recycling, which refers to a process of recycling the textile fabric back into fibers without the use of any chemicals. these textile fabrics are shredded and carded multiple times to fully extract individual fibers from the fabric. The fibers are then spun back into new textiles. This process is best for textiles made of non-blend fabrics, such as 100% cotton fabrics. Such fabrics are easier to be mechanically recycled as the fibers do not have to undergo as much processing to be separated.

Upcycling:

Many fashion brands have established takeback and resale programs for their own products, where they clean and repair secondhand clothes from their own brands, then return them on the clothes rack again. This might also involve some degrees of refashioning or refurbishment.

Downcycling:

Downcycling of textiles refers to a process where discarded textiles are recycled into something of lower value. Examples of downcycling include recycling of used textiles into non-woven textiles, building insulation, rags, or even carpet padding.

Companies related to collecting:

- **Merchfoundry** (https://www.mf.asia/blogs/textile-recycling-singapore)

  Merchfoundry's textile recycling collection prefers the following:

  Garments that are in good condition (i.e. not stained or worn out). These will be donated to non-profit organizations, nursing homes, dormitories, and

underdeveloped countries. Clothes that are XL or larger have a higher chance of being recycled or repurposed.

Clothes or fabrics that are absorbent. These typically have a high cotton content -- the higher the better. These will be recycled into industrial cleaning cloths.

Clothes and fabrics that are not absorbent will be shipped to recycling factories, where they'll determine if the cloth can be reused for other purposes or recycled at the fibre level.

- **Greensquare** (https://www.greensquare.com.sg/)

  Collecting textile at your doorstep

  Recycling events in school.

- **Cloop Life Line Clothing** (https://recyclopedia.sg/resources/lifeline-bins)

  Operating one-stop bins to put all your clothing and textiles.

  Life Line Clothing makes sure that the old clothes don't end up in the incinerator or in landfill. They sort old clothes and textiles into 500 categories for various purposes including overseas markets, fabrics for upcycling fashion, and cleaning rags, among others thereby ensuring nothing goes to waste. Life Line's sorting facilities are in **Malaysia.**

  (https://www.youtube.com/watch?v=nu0MAevJFLI&ab_channel=CNA manual sorting)

Companies related to resale:

- **Style Tribute**: Style Tribute is a well-known platform for selling pre-loved designer items, including clothes. They offer competitive prices for luxury and high-end fashion pieces.
- **Refash**: Refash is a popular platform that focuses on selling second-hand clothes. They provide a convenient solution for selling your pre-loved items and offer instant selling prices. (https://www.channelnewsasia.com/singapore/singapore-limited-textile-recycling-sector-drives-more-interest-resell-export-unwanted-clothes-3749811)

(More examples: https://upcycledclothing1.com/clothing-recycling-in-singapore/)

Companies related to repair:

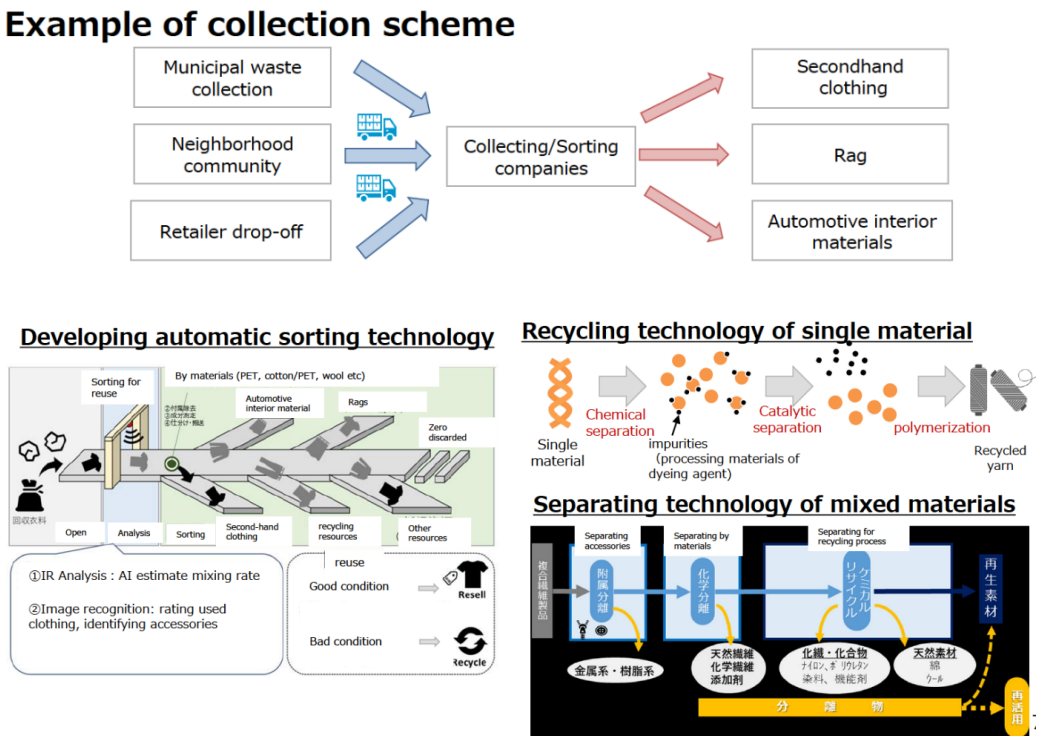
The fashion pulpit: For closes which are too precious to swap, or too bored of it to wear. Fashion items that don't make it to the swap space will be transformed into something fashionable, functional, and swappable. (Upcycling)

Company related to textile waste:

Semakau Landfill: Textile and leather waste which is not segregated at source for recycling or reuse will be sent to the incineration plant. The incinerated waste is then transported to Semakau Landfill.

Examples from Japan:

Some technologies mentioned here. Most fashion companies in Japan are involved in the textile recycling. The major clothing collection methods in Japan are municipal recyclable waste collection and retailer drop-off.

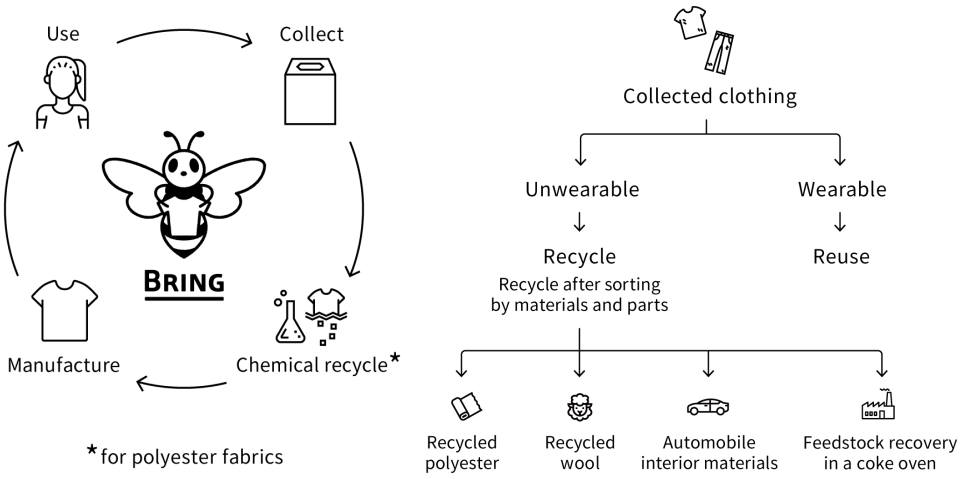


https://www.meti.go.jp/shingikai/mono_info_service/resource_recycling/pdf/004_02_00.pdf

Companies related to collect and remake:

- **BRING™:** https://www.jeplan.co.jp/en/service/bring/

  Nearly 1.5 million tons of clothing and textile scrap*1 are discarded in Japan. BRING™ is a project that works with the cooperation of consumers to recycle unneeded clothing and textiles. By **collecting** used clothing at **retail stores**, BRING™ can apply their proprietary technology **to convert polyester fibers into recycled polyester raw materials**, and then **into new clothing**. BRING™ provides various apparel brands with BRING Material™, the recycled polyester material produced in the BRING™ value chain, in forms such as PET resin, yarns, fabrics, and clothing.



  BRING Technology™ chemically decomposes polyester fibers into raw materials. Used clothing collected in the BRING™ process is first **separated** into clothing that can still be worn and that which cannot. Clothing that can **still be worn is reused**; only clothing that is **no longer wearable is recycled**.

  Recycling also requires **separation** into materials and parts, with the recycling of wool, cotton, and other non-polyester materials handled by our recycling partners.

- **Kuraray Co., Nippon Steel Corp. and Yamato Transport Co** https://wwd.com/feature/japan-makes-strides-on-textile-recycling-1703198-1631079/

  Kuraray Co. has launched a **thermal recycling project** in collaboration with Nippon Steel Corp. and Yamato Transport Co., a **national trucking company**. **Kuraray collects** uniforms and other worn-out clothing from companies and government offices. The waste is transported to **Kuraray's processing center,**

where it is **crushed into pieces** and then delivered **to a Nippon Steel mill to be used as hydrocarbon oil and cooking gas.** The plan is to recycle about 1,000 metric tons, or 2.2 million pounds, of materials, equivalent to one million units of apparel this year.

Companies related to collect and reused in chemistry:

- **JEPLAN** https://www.japanfs.org/en/news/archives/news_id030982.html

  JEPLAN was established in 2007 as a venture company to introduce **recycling-related technologies and schemes**. JEPLAN, succeeded in developing a breakthrough technology to **decompose the cellulose in cotton into an enzyme, and then convert it to ethanol.** Recycling used clothing with this technology will not only contribute to a reduction of carbon dioxide emissions from incineration but also offer hope for a next-generation fuel that does not compete with food for agricultural resources, such as fuel made from corn or soybeans.

- **RTC with Hanmo technology** https://zenbird.media/reviving-japans-traditional-textile-recycling-in-circular-fashion-scene/ https://zenbird.media/reviving-japans-traditional-textile-recycling-in-circular-fashion-scene/

  RTC introduced a system to collect T-shirts from customers every three months and craft new ones from the old ones. With a monthly fee of 1,980 yen (approximately 13 USD), customers can receive new T-shirts without generating any waste.

- **Hanmo technology** is to cut textile and clothing finely and back into fiber. For convenience, RTC's products are designed to be recycled with this technology. They feature no buttons or fasteners, and even small details such as sewing threads and washing labels are made of cotton.

Fashion companies related to the textile recycling:

- **MUJI** https://www.ryohin-keikaku.jp/eng/sustainability/environment/waste/
  For recycle items that have been used by customers for many years, or items that cannot be sold as a result of a glitch during the manufacturing and distribution process. The clothes are **re-dyed with indigo color** and given

whole new value. **Sales** of these clothes began at MUJI Tenjin-Daimyo which opened in March 2015. As of August 31, 2023, they are available at 24 stores in Japan.

- **UNIQLO** https://fashion.ettoday.net/news/2111199
  The RE.UNIQLO project of Japan's UNIQLO collects second-hand clothes from recycling bins set up in each branch, and then sorts them according to their condition. Good ones will be donated to the United Nations Refugee Agency and non-profit organizations in various places, and those that cannot be worn will be processed and used to make new clothes or supplies, so that clothes can be continuously recycled. UNIQLO also displayed 100% recycled down jackets as results.

Examples from China:

- China has the largest textile industry in the world, and over 20 million tons of textile waste gets thrown away every year. Now the country is accelerating its sustainable development by setting ambitious goals and development actions.
- Textiles made of 100% cotton or polyester are easiest to recycle and have the highest value in the Chinese recycling market. They end up, for example, as plastic particles or as fibers back to the textile industry.
  https://lindstromgroup.com/value-creation-with-textile-waste-in-china-2/

Companies related to remake and reuse:

- **Zhejiang Jiaren** https://global-recycling.info/archives/3228
  On the website, the **Zhejiang Jiaren** presents itself as “the largest chemical-method cyclic regenerated fiber company in the globe”. The enterprise adopts the trademarked **Eco Circle chemical cyclic regenerative system technology** owned by **Japanese Teijin Company.** The process uses **wasted**

polyester materials such as wasted garments and leftover materials as raw materials for production and manufactures them **into new polyester fibers with high quality, multi-functions, traceability and eternal cyclicity,** through complete chemical decomposition. The initial output consisted of 25,000 tons per year, the second-phase project aimed at 160,000 tons of output annually. A business relationship exists with global companies including Adidas, Nike, Kappahl, H&M, Decathlon, Ikea and Wal-Mart.

- Zhejiang Jiaren New Materials and **Zhejiang Lvyu Environment Protection** announced the building of the **country's largest textile recycling base in the Paojiang New District**. Furthermore, they decided to increase China's textile waste recycling capacity within two years to 600,000 tons annually or one-third of all textile waste. **The Zhejiang Lvyu Environmental Protection company was designed to turn waste textiles into polyester chips to sell them mainly to domestic textile mills.**

- **HKRITA** https://earth.org/is-hong-kongs-avant-garde-textile-recycling-facility-a-real-solution-to-fast-fashion-problems/
  One of the most innovative projects brought on by HKRITA is the '**Green Machine',** an **innovative hydrothermal separation treatment** that **can recycle blend textiles into new clean and wearable fibres without any quality loss**. Requiring only heat and very little biodegradable green chemical, the method assures that no secondary pollution is created during the recycling process.

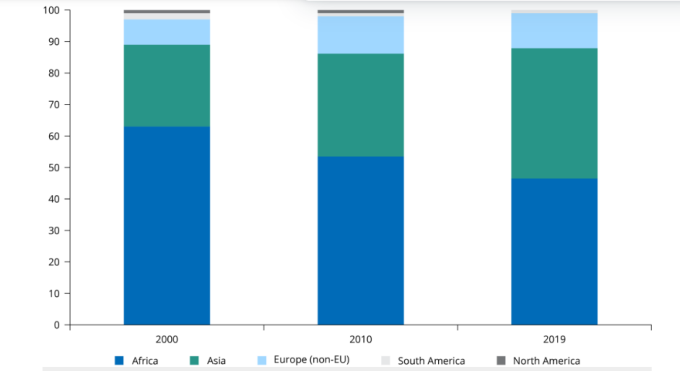
- **Online recycling** http://www.china.org.cn/china/2021-04/25/content_77456073.htm
  Using an applet in Alipay, one of China's most frequently used mobile wallets, people can arrange for a pickup service and an employee then came to the door to collect all the things people wouldn't use anymore. The entire process was free of charge.

- Recycled textiles are managed in many ways. One method is to reprocess them in an environmentally friendly way into thermal and acoustic insulation materials or other textile products. The second one is to donate relatively new items, usually

children's winter clothing, to China's poorer mountainous areas; the third approach is to deliver relatively new summer wear to impoverished or war-torn countries in Africa, Southeast Asia, and other parts of the world.

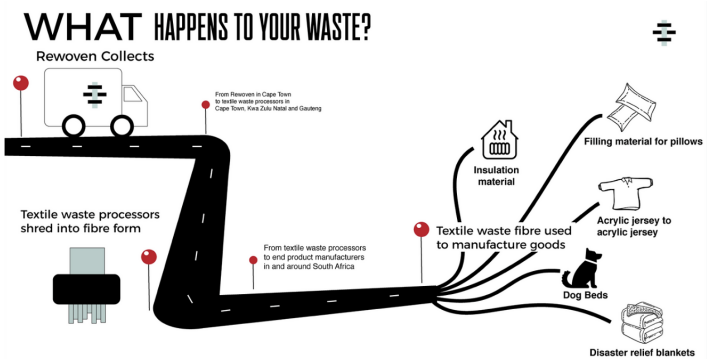
Examples from Africa:

- In 2019, 46% of used textiles ended up in Africa. The imported used textiles go mostly towards local reuse, with the remainder ending up in open landfills and informal waste streams, the report found.



EU exports of used textiles to other regions, 2000, 2010 and 2019, percentage. Note: Groupings of countries are based on those of the United Nations Statistical Office (UN Statistics Division, 2022). Source: (UN Comtrade, 2022b)

- **Rewoven** - a innovation project in Cape Town https://www.rewoven.africa/about-us



Collection-Sorting-Manufacturing

- **Africa Collect Textiles Ltd (ACT)** – a remarkable social enterprise based in Nairobi, Kenya. https://www.impacc.org/en/venture/africa-collect-textiles/. ACT is at the forefront of creating an inclusive textile value chain by establishing

business units for the collection, sorting, recycling, upselling, and reselling of used textiles. The business for example here is “From jeans to carpets”.

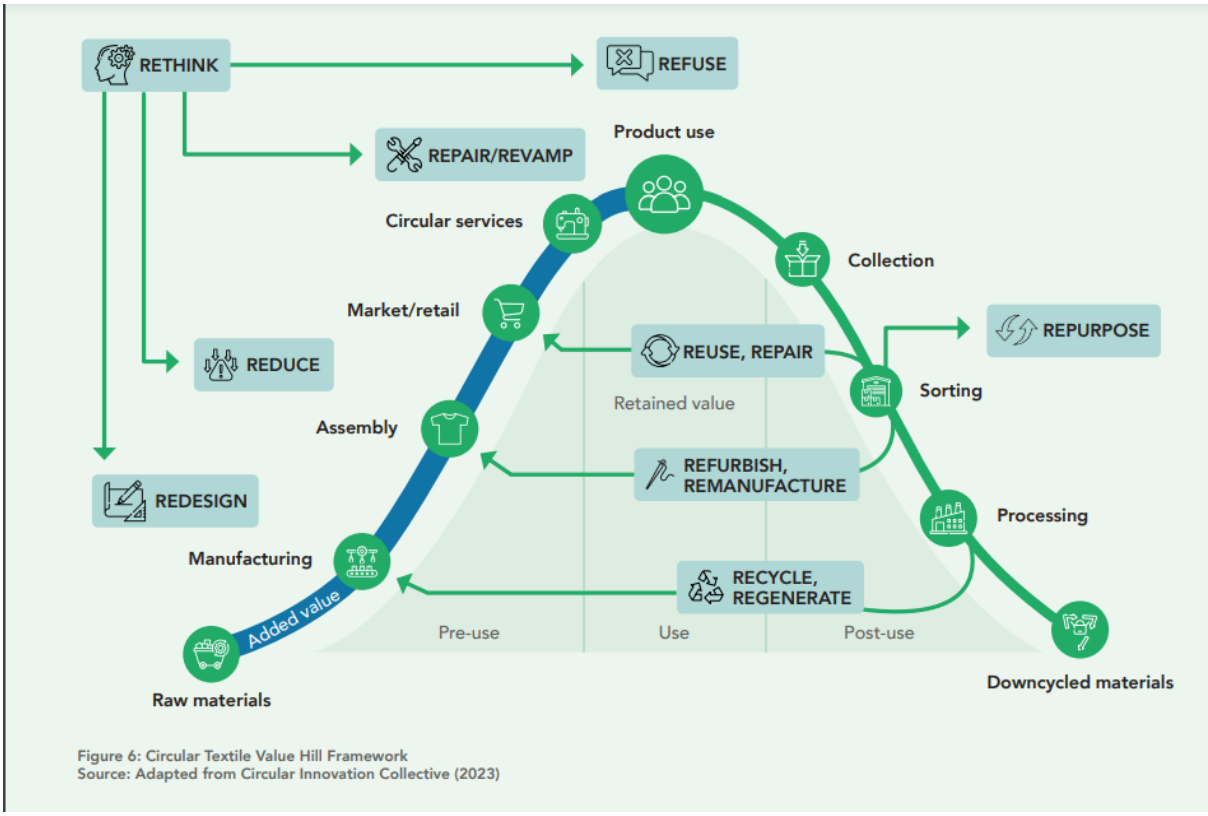


Figure 6: Circular Textile Value Hill Framework
Source: Adapted from Circular Innovation Collective (2023)

https://greencape.co.za/wp-content/uploads/2023/06/Textile-recycling-and-fibre-recovery_industry_brief.pdf

Appendix 2: Examples of textile reuse companies

Dafecor Oy is a Finnish company founded in 1994 that manufactures various nonwoven products from recycled fiber for, for example, industrial maintenance, construction, and environmental damage repair or prevention. The product range includes e.g. oil naming mats, industrial towels, parquet underlay felt and insulation products. https://dafecor.fi/

Mud Jeans is a Dutch denim brand with a strong focus on the circular economy. The company's goals include a 100% circular economy by 2025 and the first jeans made entirely from consumer-derived recycled denim. Currently, 20-40% of the material of denim products is recycled cotton and the rest virgin organic cotton. In addition, some of the products use a small amount of elastane to provide flexibility.

At the heart of Mud Jeans' mission is design according to the circular economy. Simplicity is important in the products and only organic or recycled cotton is used as materials. Elastane is used in small quantities so that the recyclability of the products in the future is guaranteed. Also, for example, the buttons are made of recyclable, 100% stainless steel. For better recyclability, Mud Jeans has replaced the leather brand logo often seen on jeans with a print.

In addition to product design, the business model also takes into account the circular economy. In addition to buying jeans, Mud Jeans also offers a rental option. They also encourage you to return used jeans to the company, and for the first year after purchase or rental, they also offer a free repair service.

Neaustima is the manufacturer of nonwovens in Lithuania. Main focus is the production of needle punched, thermal bonded, spray bonded nonwovens and PES fiber balls. They export their products to the countries in Europe and North America. They are the recyclers of post-industrial textile waste into fibers. https://www.neaustima.lt/

The Danish company **Really** uses recycled textile fiber in acoustic panels and interior fabrics. https://www.kvadrat.dk/en/kvadrat-really

Nordic Upstream manufactures wall and floor panels, trays, tables and chairs from completely recycled materials – for example surplus from other industries, side streams or waste – among other things. https://www.nordicupstream.com/

Pure Waste in Finland manufactures threads, fabrics and clothes from 100 percent recycled material. The main raw material is cotton cutting waste, which is processed into recycled fiber at the place of origin of the cutting waste, in India, at a factory owned by the company's partner. In addition to mechanically recycled cotton, chemically recycled polyester fiber obtained from PET bottles is used as reinforcement in the production. www.purewaste.com Profit –326 thousand €

Univisio is a Finnish company that manufactures bed textiles - such as blankets, pillows and sheets. The products are manufactured in Finland, and the largest customer base is made up of various companies and central stores, as well as the public sector. Univision's products have long used polyester fiber and fabric made from recycled, clean PET bottles, but now the company is also investigating recycling its own side streams into new products. https://www.univisio.fi/

Spinnova develops the use of cellulose fiber especially for the needs of the textile industry. The company has expanded VTT's laboratory-scale process of turning wood fibers into yarn to a production scale. Compared to the use of cotton, the production of yarn produced from wood fiber using Spinnova's method consumes 99 percent less water. No solvents or other harmful chemicals are used in the process. The yarn can be made into fabric, which is well suited for use in the clothing and textile industry. https://spinnova.com/ Profit –13,3 million euros

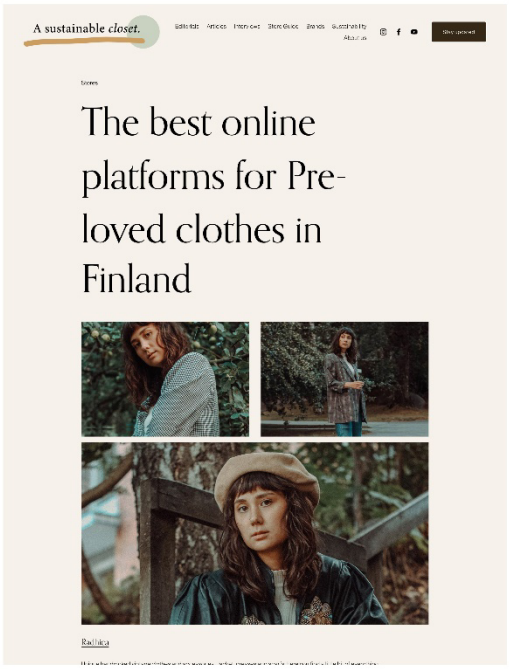
Infinited Fiber is a fashion and textile technology company which turns trashed textiles into premium-quality fiber for the textile industry using its patented technology. Infinited Fiber breaks waste down to molecular level and captures its value by giving it new life as Infinna™ textile fiber that looks and feels like cotton and is known scientifically as cellulose carbamate fiber. https://infinitedfiber.com/ Profit –17,4 million euros

Appendix 3: Additional material related to second-hand textile organizations in Finland

www.asustainablecloset.com

Online second hand, vintage and pre-loved stores in Finland - A Sustainable Closet

Finlands best stores, apps and online market places for second hand, vintage and pre-loved



UFF uff.fi

In English - UFF

UFF - Briefly in English

tori

Hanki vaatteet, kosmetiikka ja asusteet netistä | Tori

www.fida.fi

Home - Fida secondhand

Do you wish to donate goods for charity? We provide a free pick up service in the Helsinki, Tampere, Lahti, Hämeenlinna and Kotka regions. If you live outside the Helsinki region or Tampere, please store for more

emmy

emmystore.com

Emmy - webstore for pre-owned premium clothing

Emmy is a web store for pre-owned premium clothing and accessories. Find your second hand favorites online!

tise

tise.com

Tise

Tise is a social, mobile marketplace for second-hand fashion and interiors. Download the app here.

zadaa.co

Zadaa - buy and sell quality pre-loved fashion!

Embrace a sustainable lifestyle through pre-loved fashion.

www.vestiairecollective.com

Vestiaire Collective: Buy & sell designer second-hand fashion.

3 million items, 12,000+ brands. Luxury pre-loved fashion, up to 70% off. Expert authentication, trusted by millions.

radhica.fi

Radhica - Vintage-vaatteisiin erikoistunut suomalainen verkkokauppa

Radhica on suomalainen naisten vintage-vaatteisiin erikoistunut verkkokauppa. Jokainen ostopäätös on ääni sellaiselle maailmalle, jossa sinä haluat elää. <3

The Ateljé

theatelje.com

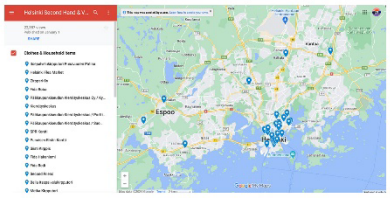
Vaatelainaamo The Ateljé - Vaatevuokraamo verkossa

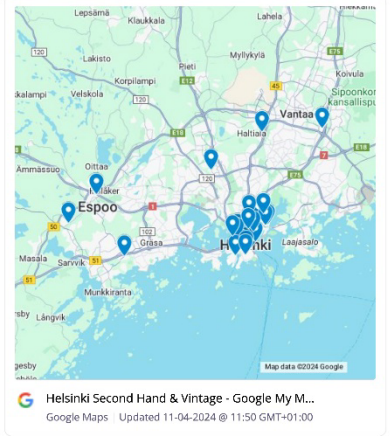
Vaatelainaamo The Ateljé on uuden ajan vaatevuokraamo, joka toimittaa vaatteita vuokralle koko Suomen alueelle. Vaatelainaamo palvelee Helsingin Viiskulmassa.

kathrindeter.com

Guide to Second Hand shopping in Finland

Second hand shopping in Finland is popular and a lot of fun! Here are my tips for a rewarding experience and great vintage finds!





Helsinki Second Hand & Vintage - Google My M...

Google Maps · Updated 11-04-2024 @ 11:50 GMT+01:00

Second hand shops in Finland & Helsinki

Clothing

UFF: UFF has a bunch of stores around Finland that resell clothes that have been donated. You can also donate your items in-store or in collection containers. Items are carefully sorted and displayed in their respective categories, there are also dedicated vintage stores. Keep an eye on their social media for the "uusi valikoima" dates, which is when their new stock arrived, or also for the "tasarahapäivät" that happen shortly before. Then, all existing stock is sold for very little money – 1€ only on the last day!

Self-service flea markets

Relove: Relove has quickly become a local favourite for finding second-hand treasures. Here it's a great spot for items of higher quality or from brands, and it's pretty wonderful to browse through. Several locations.

Moody Monday: self-service flea market with good prices for mainly basic second hand items. Several locations.

Siisti kirppis: stylish and modern Neighbourhood flea market in Jätkäsaari for clothing, where you can find both trendy items as well as classics.

Bella Kirppis: large self-service flea market in the Pasila district. Great for exploring or selling your own things.

Birka: many high-quality clothing items for sale here, a good spot for some classic design deals as well.

Preporter: High-end clothing items and shoes, a good spot for occasionwear.

Punavuoren Patina: small and cozy self-service flea market where you can find clothes and homeware items, too. Also: excellent cinnamon buns!

Helsinki Flea Market: hidden gem in a conspicuous cellar at Hietalahti – self-service mainly but also some curated items.

Vintage Clothing

Frida Marina: is a second hand and vintage shop located in Kallio, where you can often find old Marimekko items along genuine vintage garments.

Hoochie Mama Jane: well known for their great collections and outstanding customer service, the very knowledgeable staff will help you find the perfect piece.

Penny Lane: travel through time with Penny Lane and discover some truly unique vintage items.

Play it again, Sam: true vintage gems with fantastic service as well. For Finnish retro garments and high quality dresses, or also some oddities, these are your best bet.

Home, Furniture & Clothing

FIDA: Fida is great for home and interior stuff, but I have also found some great clothing pieces here. Most locations also have furniture on offer.

Kierrätyskeskus: these Recycling centers are all around the country, and the locations are huge, and therefore mostly out of the city centers. You can find anything from furniture to homeware here. I personally don't recommend it for clothing. The Niihtisilta is enormous and amazing.

SPR-Kontti: the second hand outlets from the Finnish red cross, similar concept to the Kierrätyskeskus one, large stores and a variety of household and clothing items.

Tavara rahaksi: both in their Espoo store and online, you can find any kind of second hand and vintage items. Check their prices of the day online.

Online & Apps

Tori.fi: the main marketplace that is used in Finland. Finnish only, but easy to use.

Facebook Marketplace: Is very popular here, but I recommend checking the neighbourhood specific groups instead.

Zadaa app: Mostly for clothing and accessories. Easy to browse and buy directly through the app without having to interact with a seller. Good option if you are into Finnish brands.

Tise app: Sales app for clothing and other items. Easy to use and full of treasures.

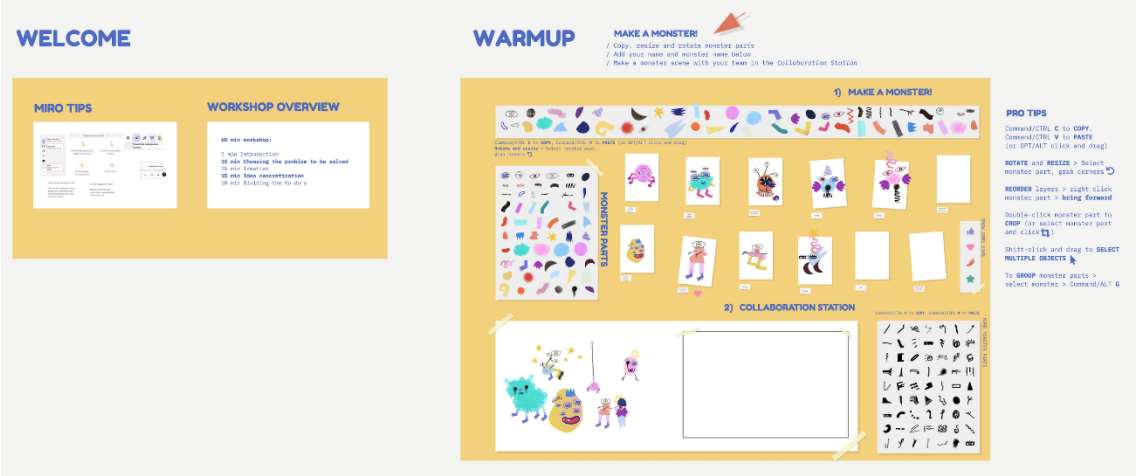
Vinted: app for mostly clothing, that allows you to easily browse second hand items also from abroad.

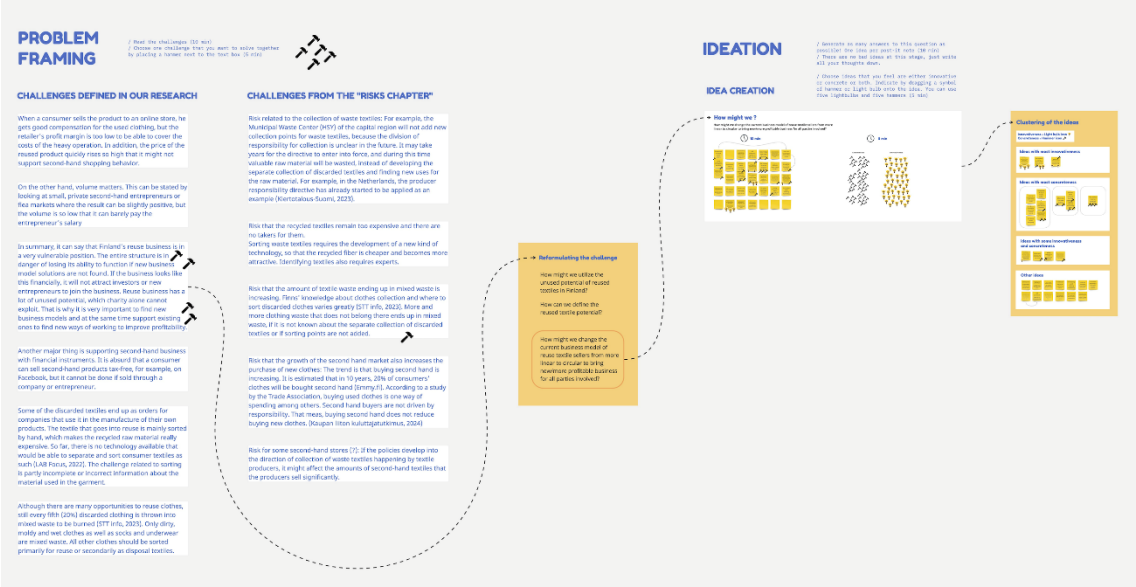
Facebook selling groups in Helsinki

- Jätkäsaari
- Lauttasaari
- Kamppi
- Central Helsinki
- Töölö
- Eira, Punavuori, Ullanlinna
- Kallio
- Vallila

Appendix 4: Problem framing and ideation workshop contents

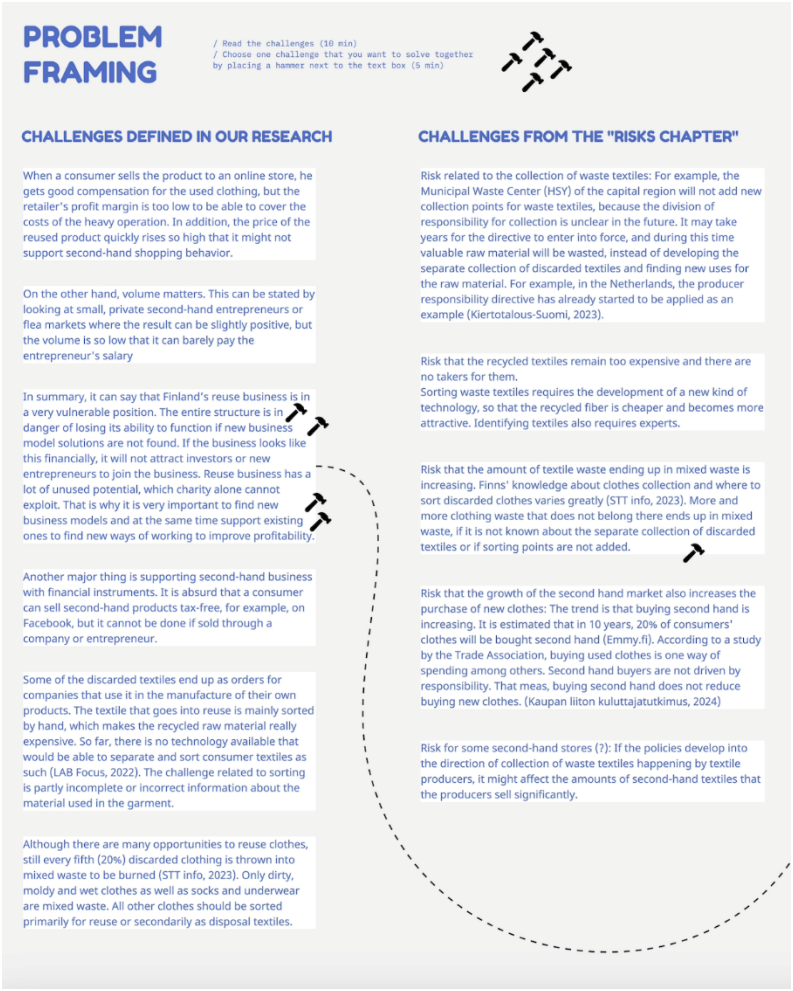
1) Contents of the whole workshop (screenshots from Miro board)



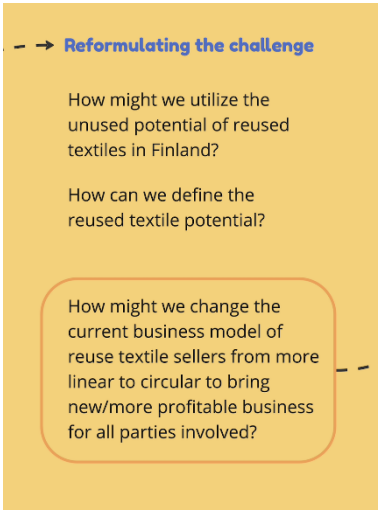


2) Results from the workshop

Chosen problem to be solved (/ideated upon) based on the amount of hammer icons:



Reformulation of the chosen challenge into an ideation question:



All ideas created during the workshop organised in clusters after the workshop: