

Project 3 - Recycle Me

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[Final Product](#)

COMPSCI 79: Design of Useful and Usable Interactive Systems

Milestone 1: Identify Problem Area

Problem Areas

Problem Area 1: Pandemic Preparation and Response

- A description of the problem area:
 - Covid-19 has been living with us for over two years. We've seen multiple outbreaks of newly emerging diseases over the past 50 years, including several other coronaviruses. It happens as predictably as lightning starting a forest fire. It is a long game for human beings to fight against the pandemic, which we have already learned through Covid-19. As a result, it is critical for human beings to think smart and move fast to respond to these diseases.
- Mission:
 - Use mobile technology to make everyone involved in fighting against the current and future pandemics.
- The population(s) you wish to target:
 - (Initially) People living in the US.
- Needfinding interviewees:
 - This project aims to interview people of all ages, cultures, and vocations in the US to learn about their attitudes/actions/ problems during the pandemic. We can start by reaching out to friends, schoolmates, and family members.
- Design inspirations (examples of specific questions or problems, statistics) that will help the reader see more concretely what kinds of things could be improved:
 - How can mobile technology provide people with knowledge about the pandemic?
 - How can mobile technology keep people updated with the latest news about the pandemic?
 - How can mobile technology help people learn if they have been in touch with someone who has got COVID?
 - How can mobile technology form an online community for people who have got COVID to share their experiences (i.e. of how to recover soon, which masks are of good quality)?
 - How can mobile technology remind people of health tips (i.e. reminding people of wearing a mask)?
 - How can mobile technology help people to learn about their living/working community's cases?

- How can mobile technology provide information about the nearest hospitals, vaccination spots, and stores where masks are available?
 - How can mobile technology connect patients who got COVID with doctors through online appointments?
 - How can mobile technology connect people with local community services in terms of food/medication delivery during the pandemic?
 - How can mobile technology help to support those relatively vulnerable populations (i.e. old people who live alone, homeless, and low-income families)?
- Major products/solutions already targeting this problem area (that's your competitive analysis); aim for about 3-5 diverse examples that show the true extent to which this problem area has been addressed by others. Keep your eyes open for non-mobile or non-technology solutions that exist in that space. For each, explain briefly what specific problem the product addresses and how. Feel free to include screenshots or other illustrations if this helps to explain the product.
 - In the last two years, we have seen that different countries have their own ways of dealing with Covid-19 variants. However, it is increasingly essential for every single person to learn how to protect themselves and take care of their friends and family members. We should use COVID-19 as a starting point to learn about future pandemic preparation and response so that we won't leave the pressure merely to the government or healthcare systems. Instead, everyone is involved in this fight. This project targets the current pandemic, in this case, COVID-19, but will be used as an example for any future virus variants, especially for vulnerable populations that tend to be more easily affected by the pandemic.
 - Besides, the current solutions by using technology are separated and limited. They are mainly represented as maps, case reports, and exposure alerts. There hasn't been a systematic information hub concerning personal healthcare.
 - The governments have their own website to report cases. For instance, the US CDC has the COVID Data Tracker website to help report cases, deaths, hospitalizations and vaccinations. Healthcare facilities, for instance, John Hopkins, has a COVID-19 dashboard to report both global and national cases.
 - Google collaborates with both IOS and Android systems to have bluetooth exposure notifications in mobile phones to help people report cases so as to remind those who might be infected.
 - The NHS COVID-19 app is the official contact tracing app for England and Wales and is one of the fastest ways of knowing if you're at risk from COVID-19. The NHS COVID-19 app features include alerts, latest information, symptoms, and tests. The app can be used when traveling across England, Wales, Northern Ireland, Jersey and Gibraltar, detecting contact tracing app users (regardless of them using different official apps),

and alerting them if they have been in contact with someone who later reported a positive test result in the app.

- Is there room for a technology-based intervention? Given what has been tried before, is there reason to believe that you can make a substantial positive impact with a technology-based intervention?
 - A technology-based intervention would help solve this problem. An application that warns and teaches people correct information about the virus would help many people with limited access to health facilities.

Problem Area 2: Waste in the Fashion Industry

- A description of the problem area:
 - The fashion industry is one of the most leading industries to cause substantial waste in the world. Approximately 92 million tons of textile waste come from the fashion industry. The root cause of this problem is overproduction. Every season, about 30% of the clothes that are produced are never sold. This waste projection will increase by around 60 percent from now to 2030. To exemplify the problem more concretely, in March 2018, the fast fashion powerhouse H&M reported 4.3 billion in unsold inventory. Furthermore, textile overproduction by fashion companies produces harmful waste for our planet, where 85% of textiles are thrown away into landfills or burned. Hence, clothing waste is threatening the environment and communities around the world.
- Mission:
 - Use technology intervention to fight against the fashion industry's linear model, which results in substantial waste in landfills. Our intervention values a circular system that values recycling and reclaiming of products.
- The population(s) you wish to target:
 - This problem affects everyone in the world. The waste generated occurs in different groups that are part of the problem. People with higher incomes produce 76 percent more clothing waste than people with lower incomes. Brands have a bigger responsibility in this movement of mass production and waste. Owners of local thrift stores in the United States also contribute to this issue because the number of clothes they receive exceeds the amount they can sell. They usually ship the excess clothes abroad or waste them in situations like this.
- Needfinding interviewees:
 - For this project, we are going to involve people with a wide range of backgrounds, including clothing brands, designers, local businesses (such as thrift store owners) and organizations (host clothing drives), and consumers to learn more about their involvement in the mass waste of this industry. To find these people, we will be doing mass outreach via email or the network of people who we know are involved in work like this.
- Design inspirations (examples of specific questions or problems, statistics) that will help the reader see more concretely what kinds of things could be improved:

- How can technology intervention help brands, designers, local businesses, and consumers reduce waste in the fashion industry?
 - How can technology intervention help the people producing the clothes not fall into the rabbit hole of putting unwanted fabric to waste?
 - How can technology intervention help consumers access clothes produced for sample or not suited for the current season anymore?
 - How can the technology intervention benefit organizations that host clothing drives to distribute winter clothing?
 - Clothes that aren't recyclable, how can the technology intervention help with identifying not recyclable clothes, and what can the brands do to ensure those are getting used in some other form of way?
 - Luxury brands have a reputation for being exclusive with their design and materials. Would they be willing to have their pieces offered with discounts in thrift stores or clothing drives if the technology intervention allows easier access to those materials to people? Luxury brands' status is money; only a small percentage of people can afford to wear their materials.
- Major products/solutions already targeting this problem area (that's your competitive analysis); aim for about 3-5 diverse examples that show the true extent to which this problem area has been addressed by others. Keep your eyes open for non-mobile or non-technology solutions that exist in that space. For each, explain briefly what specific problem the product addresses and how. Feel free to include screenshots or other illustrations if this helps to explain the product.
 - This problem has not been addressed as extensively as it has. For example, some brands have aimed to reduce waste and emit less trash to landfills, however, many still produce large amounts of waste in trash centers. Another solution is thrift stores, where people can buy clothing others do not want/need anymore. Yet, the number of clothes they receive exceeds the amount they can sell. They usually ship the excess clothes abroad or waste them in situations like this. Other solutions include small projects that would send the clothing to homeless shelters, however, they have also not gained enough traction to become large-scale in cities and states.
- Is there room for a technology-based intervention? Given what has been tried before, is there reason to believe that you can make a substantial positive impact with a technology-based intervention?
 - A technology-based intervention would help solve this problem. A technology-based intervention can fight against the fashion industry's linear model, which results in substantial waste in landfills. Our intervention values a circular system that values recycling and reclaiming of products.

Milestone 2: Needfinding and Moral Stance

Final Problem Area & Mission Statement

Waste in the Fashion Industry

- A description of the problem area:
 - The fashion industry is one of the most leading industries to cause substantial waste in the world. Approximately 92 million tons of textile waste come from the fashion industry. The root cause of this problem is overproduction. Every season, about 30% of the clothes that are produced are never sold. This waste projection will increase by around 60 percent from now to 2030. To exemplify the problem more concretely, in March 2018, the fast fashion powerhouse H&M reported 4.3 billion in unsold inventory. Furthermore, textile overproduction by fashion companies produces harmful waste for our planet, where 85% of textiles are thrown away into landfills or burned. Hence, clothing waste is threatening the environment and communities around the world.
- Mission:
 - Use technology intervention to reduce the fashion industry's harmful impact on the environment. Our intervention values a circular system that values recycling and reclaiming of products in brands and retailers, local thrift shops, and customers.
- The population(s) you wish to target:
 - The populations we want to target are brands and retailers, local thrift shops, and customers. In terms of brands and retailers, we will target local fashion stores in Cambridge and Boston, such as H&M. We will also target local thrift stores, such as Castanet. These stores have a bigger responsibility in this movement of mass production and waste. In terms of consumers, we focus on customers who shop for clothing in the stores mentioned above because people with higher incomes produce 76 percent more clothing waste than people with lower incomes.
- Needfinding interviewees:
 - For this project, we are going to interview local businesses (such as thrift stores), branches of larger fashion stores (H&M), and consumers to learn more about their involvement in the mass waste of this industry. To contact these individuals, we will survey managers, employees, and shoppers in clothing stores in Boston.
- Design inspirations (examples of specific questions or problems, statistics) that will help the reader see more concretely what kinds of things could be improved:
 - How can technology intervention help brands, designers, local businesses, and consumers reduce waste in the fashion industry?
 - How can technology intervention help the people producing the clothes not fall into the rabbit hole of putting unwanted fabric to waste?

- How can technology intervention help consumers access clothes produced for sample or not suited for the current season anymore?
 - How can the technology intervention benefit organizations that host clothing drives to distribute winter clothing?
 - Clothes that aren't recyclable, how can the technology intervention help with identifying not recyclable clothes, and what can the brands do to ensure those are getting used in some other form of way?
 - Luxury brands have a reputation for being exclusive with their design and materials. Would they be willing to have their pieces offered with discounts in thrift stores or clothing drives if the technology intervention allows easier access to those materials to people? Luxury brands' status is money; only a small percentage of people can afford to wear their materials.
- Major products/solutions already targeting this problem area (that's your competitive analysis); aim for about 3-5 diverse examples that show the true extent to which this problem area has been addressed by others. Keep your eyes open for non-mobile or non-technology solutions that exist in that space. For each, explain briefly what specific problem the product addresses and how. Feel free to include screenshots or other illustrations if this helps to explain the product.
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- Is there room for a technology-based intervention? Given what has been tried before, is there reason to believe that you can make a substantial positive impact with a technology-based intervention?
 - A technology-based intervention would help solve this problem. A technology-based intervention can fight against the fashion industry's linear model, which results in substantial waste in landfills. Our intervention values a circular system that values recycling and reclaiming of products.

Background

For this project, we have collected various statistics that demonstrate the harmful impact clothing waste has on the environment. In terms of textile waste, 20% of worldwide waste is created by the textile and garment industries. For example, in the UK, 30% of unwanted clothing ends up in landfills. 1% or less of textile waste is recycled. From a large perspective, every year the fashion industry creates 40 million tonnes of textile waste. However, textile waste is not the only type of waste affecting the environment.

In terms of microfibres, 35% of microplastic pollution is caused by washing synthetics. Furthermore, 73% of the synthetic fiber pollution in the Arctic is from polyester. In terms of cotton, less than 1% of the world's cotton is organic. Surprisingly, 2,700 liters of water can be saved per t-shirt using recycled cotton. In terms of fashion's effect on people and animals, 99% of leading fashion brands don't reveal how many workers in their supply chain are being paid a living wage. For example, clothing in the top 5 industries is at risk of modern slavery. Similarly, one billion animals are slaughtered for the leather industry each year, 14% of brands have improved their animal welfare since 2019, and only 21% of brands trace animal-derived materials to check for animal welfare. The surprising statistics of waste and the effects of the fashion industry across various levels of society are putting humans and the earth at risk of global warming, unlivable circumstances, and lack of resources.

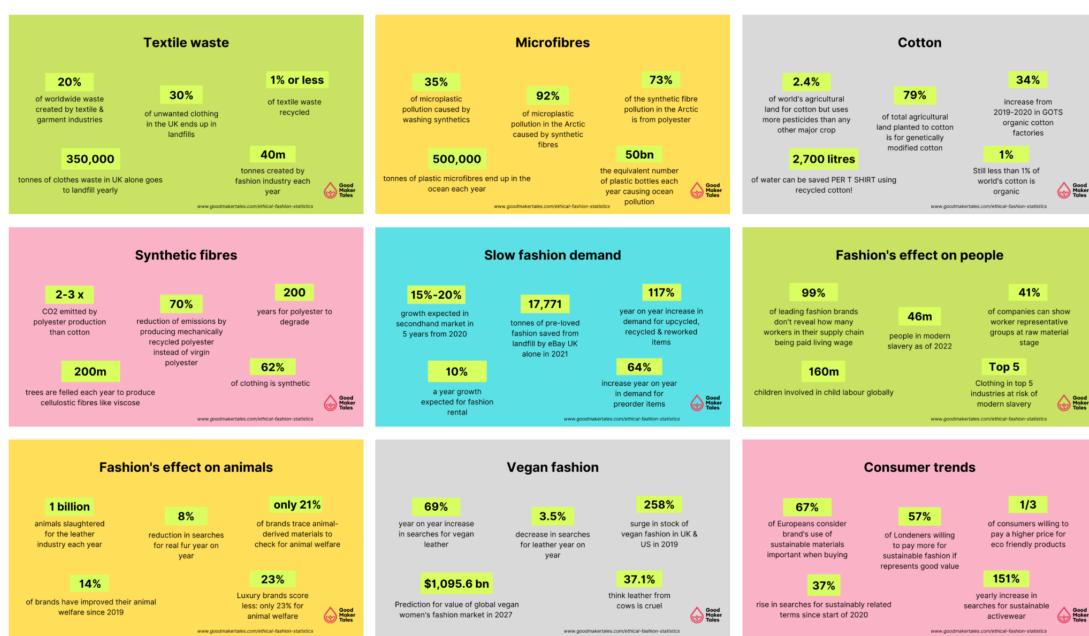


Figure 1: Miro Board Statistic Compilation



Figure 2: Miro Board Stakeholder Compilation

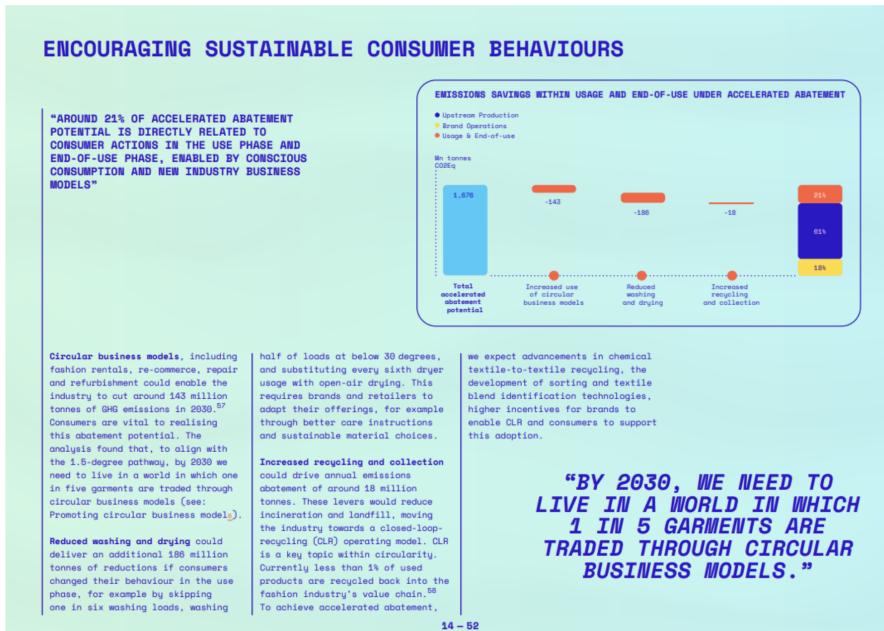


Figure 3: Miro Board Sustainability Efforts

Stakeholders for Needfinding

Regarding various stakeholders involved in the fashion industry, we identified these key groups: fashion designers, investors, regulators, governments, local thrift shops, employees, customers, brands and retailers, pressure groups, suppliers, and factories. And we identified brands and retailers, customers, and local thrift shops as our primary focus for these reasons. First, customers are the direct stakeholders who consume the products. Their consumption habit determines how the other stakeholders react. Based on the report collaborated by Global Fashion Agenda and McKinsey & Company called *Fashion on Climate* (2020), customers contribute about 18% of the carbon emissions of the fashion industry through their usage and end-of-use habits. At the same time, brands and retailers contribute around 21% through their operations. Although 61% is produced by factories, material producers, and other upstream players, we believe that they are highly impacted by the decisions made by brands and consumers. Brands and retailers should support value chain players in tracking, analyzing, and benchmarking their carbon emissions and enhancing transparency. And every citizen should work to extend the longevity of our clothes. Besides, it is easier for us to access these three groups by conducting interviews to get first-hand information.

After finishing the first round of analysis, we decided to conduct interviews with customers, retailers, and thrift shops. When determining which retailers we wanted to interview, we selected three brands from different countries: Japan, Sweden, and the United States, to diversify our culture. However, we tried to choose brands with similar price levels to ensure that the price won't be a critical issue affecting their decisions regarding sustainability. As a result, we selected three stores in Newbury Street to conduct our interviews: Uniqlo, Champion, and H&M. We also interviewed one local thrift shop there. Detailed information about our interviews is documented in the appendix.

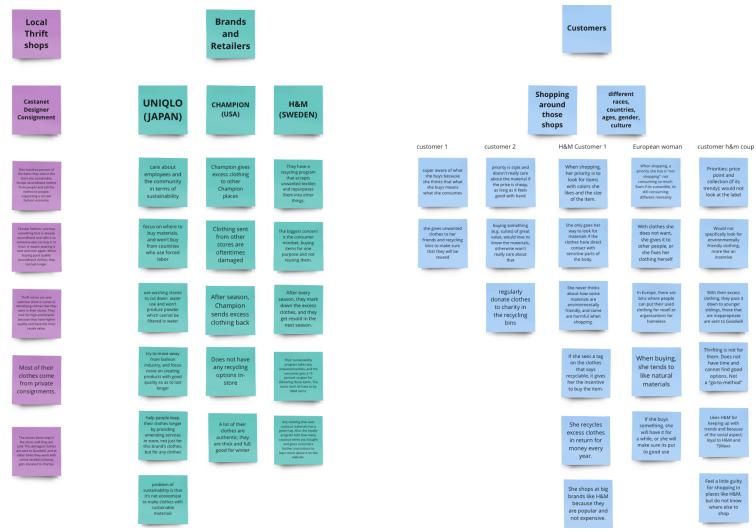


Figure 4: Involved Stakeholders

Key Insights from Interviews

The sustainability effort in the fashion industry can be seen through the recycling programs many brands are incorporating as part of their brand persona. Based on our interviews, we have identified four subcategories of recycling programs.

1. Online recycling.

- Brands like H&M use online recycling platforms to allow customers to give them unwanted textiles to reuse for something else. The only thing the customers are doing is giving H&M those unwanted textiles and H&M is taking care of the process of making sure it is getting put to good use. Also, H&M offers customers a 15 percent coupon as an incentive for making an effort to recycle the items instead of putting them in landfills. Thrift stores are also utilizing online platforms to increase their sales. Clothes that don't get sold are usually put on online platforms for resale. The thrift store's money from selling the item online goes to charity.

2. In-store recycling program.

- Thrift stores publicize themselves as stores that sell one hundred percent sustainable items. All the items they own come from their private consignment contractors. Thrift stores contribute to the circular economy in fashion— they accept secondhand items from people and sell them in stores. Other fashion brands like UNIQLO have recycling bins that collect 200-400 items monthly. The recycling bin is so visible in the store that it's hard for customers to miss it. The purpose of having recycling bins in physical stores is to allow people to keep clothes longer.

3. Community.

- Community members support maintaining sustainability in fashion by regularly donating excess clothes to charity or local recycling bins. This helps keep community members accountable for the waste and contribute their

efforts to what brands want to achieve. Cities like Boston don't allow any waste to go into landfills. Community-wide efforts like this are necessary to move to a more sustainable world.

4. Family/Friends.

- Those with big families or siblings who are the oldest pass on their clothes to other family members. This approach to reducing overconsumption is more common because it is easier to give it to someone you know will put it to good use instead of relying on some other recycling programs.

Aside from the different recycling initiatives, sustainable approaches can be implemented through information about sustainable materials, ensuring good quality, and redesigning the sale model.

5. Information about sustainable materials.

- Some brands have big billboards around the store to inform customers about their sustainable efforts. Suppose some clothes use materials that aren't environmentally friendly. In that case, some brands have a green tag attached to the price tag to indicate to the customers that it is a cautious item and that recycling it is different from other items. For some customers, the green tag gives them the incentive to buy the item, and they feel that they're making a positive, sustainable effort if they buy the item with the tag.

6. Ensure good quality.

- Second-hand stores are selective with their selection of clothes that they display. Only items that are in good condition despite being used before getting displayed in the store. This selective selection allows the customers to buy good quality items and be able to recycle/resell them after use. Some brands have started using good materials in their items that last longer instead of just producing them to meet the market's needs.

7. Redesign of the sale model.

- Some brands like UNIQLO don't buy materials for their product from countries that use forced labor. This varies from brand to brand. UNIQLO shifted its perspectives from the sale model to avoid dealing with enormous amounts of excess out-of-season clothes. They buy/produce small and can keep up with the pace if there's more need for a particular product. The items that don't get sold in one season come back next season around the same time, but the price gets marked down.

current recycle program

Online Recycling	In-Store Recycle Program	Community	Family/Friend	information about sustainable materials	ensure good quality	others	problems/barriers
They have a recycling program where unwanted textiles are turned into other things.	Other members of the family they care for have a recycling bin at home. They are more aware than people and set the example for supporting a circular fashion economy.	regularly donate clothes to charity in the recycling bins	she gives unwanted clothes to her family and recycling bins to make sure that they will be reused	don't promote or brand for sustainable materials, but they have labels and tags to convey the information	try to move away from fast fashion and focus more on creating products that last and quality is as to last longer	use washing cycles to cut down water usage and detergent produce powder which cannot be filtered in water	problem of sustainability that it's not enough to make clothes with sustainable materials
The sustainability awareness has increased, and the average consumer is more willing to return items for recycling. Items that can be recycled now have to be taken apart.	recycling bins can collect 200-400 a month. It's getting more and more popular every year.	She recycles excess clothes to return for money every year.	With their excess clothing, they pass it down to their siblings, those that are keep clothes are sent to Goodwill	Any clothing that uses organic cotton, bamboo, green tag, etc. the quality is better. She also likes to buy from brands that have more about it on the website	They dress are very well made. She likes identifying clothes that they are well made. She also likes to buy from brands that have higher quality and use forced labor	focus on where to buy materials, and they buy from countries who use forced labor	Clothing sent from other stores are oftentimes damaged
The excess items are in the recycling bins, and the average consumer is more willing to return items for recycling. Items that can be recycled now have to be taken apart.	Recycle bin in store to collect clothes for charity or to help others. Korean to make doos	In terms of donation, the parker happens to work with local communities	With clothes she does not want, she gives it to other people or she feels her clothing herself	If she sees a tag on clothes that says recyclable, it gives her the incentive to buy the item.	Champions A lot of brands are authentic, they are thick and durable for cold winter	We're moving away from fast fashion due to the lack of resources and the lack of environmental and community minded brands	Champion doesn't have any recycling options in-store
Most of their clothes come from private consignments.	Boston is to help trans and ts to find clothes	In Europe, there are bins where people can put their used clothing back to organizations for homeless.	When shopping, she tends to like natural materials	When shopping, a priority she has is that containing no mohair, wool, polyester, etc. off consuming, offcourse recycling	After every season, they mark down the excess clothes, and they get rid of them next season.	Super aware of what she buys because she thinks that what she consumes	Priorities: price and collection (if as trend) would not look at the label
She thinks thrift stores are good for the environment.				Likes H&M for跟着季节的 trends and because offcourse people have to pay H&M and TP Maxx.	Likes H&M for跟着季节的 trends and because offcourse people have to pay H&M and TP Maxx.	If she buys something, she	Would not specifically look for environmentally friendly clothing, more as an incentive
help people keep							

Figure 5: Key Insights

Milestone 3: Moral Stance and Revision

What Else Was Learned

Last week, we targeted three groups of stakeholders to interview. This week, through the group self-reflection and feedback, we have learned and revised a few aspects of our project. First, we wanted to narrow our targeted consumers to fast-fashion consumers, and retailers in fast-fashion industries, instead of luxury ones. As a result, we found that the local thrift shop we interviewed for Milestone 2 did not fit into our analysis because it was a thrift store, yet it mainly targeted luxury brands that have a high resale value. Therefore, during this week's milestone, we have decided to interview the thrift store chain called Goodwill because it recycles all brands and would provide a greater representation of thrift stores in the US.

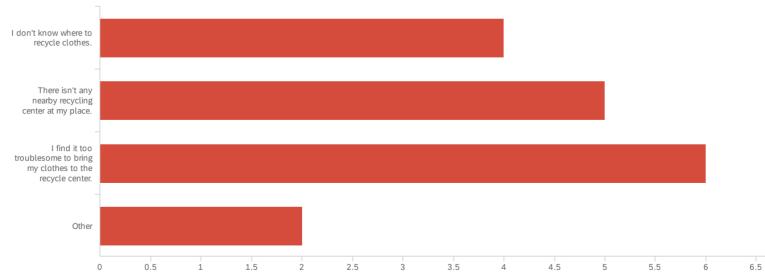
Secondly, based on the interviews we conducted last week, we found that retailers have already begun contributing to fashion sustainability in different ways, such as H&M. Furthermore, our interviews revealed that not all consumers realize that what they buy, wear, and throw impacts the climate greatly. As a result, we would like to focus more on consumers as our main target stakeholder group this week to find out what personal habits they have for recycling clothes. Specifically, how should thrift shops, retailers, and brands improve their work to promote sustainability with consumers? To achieve this, we decided to conduct a short online survey (see Appendix) to ask consumers questions about their habits while buying, recycling, or giving away clothes. The questions intend to test if consumers are aware of the fashion industry's sustainability assets, know more about their recycling habits, and learn more about how they can be motivated to promote sustainability.

Revision From Last Week

Last week, we focussed on several stakeholders and key insights. Although there was no feedback during the studio because of time management issues with group presentations, general comments left on Milestone 2 drove us to narrow down our stakeholders and the problems that we will address in this project. In terms of stakeholders in the group, we have revised our stakeholders to be customers of fast-fashion retailers, fast-fashion retailers, and thrift stores. The following section will delve deeper into the stakeholders of this project, however, we are still using the same interviews from Milestone 2, as well as new interviews with thrift store owners (see Appendix).

In terms of key insights, we have used the previous data observations and clustering, as well as newly-collected data, to focus on problems. As stated in the section above, we conducted an online survey to narrow down problems that inhibit users from engaging with sustainable practices. As Figure 6 shows (see Appendix for the survey), many customers were not aware of recycling options from fast-fashion stores. This confirms our previous suspicions from last week, where several customers said that they were not aware that H&M and Champion had recycling options. Furthermore, those that did consider recycling their unwanted items were lost in terms of locations where they can send their clothing.

Q6 - What problems did you ever have with clothing recycling?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	What problems did you ever have with clothing recycling? - Selected Choice	1.00	4.00	2.35	0.97	0.93	17

#	Field	Choice Count
1	I dont know where to recycle clothes.	23.53% 4
2	There isn't any nearby recycling center at my place.	29.41% 5
3	I find it too troublesome to bring my clothes to the recycle center.	35.29% 6
4	Other	11.76% 2

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Figure 6: Results from Survey

Another major barrier to textile recycling, as seen with our expanded interview observations (see Figure 7), is that many customers were not incentivized to recycle because of no immediate benefit. Some customers said they cared about clothing trends and materials, with sustainability being considered a positive addition but not a requirement. Surprisingly, customers that did consider sustainability, admitted that they continued to shop at fast-fashion stores because they do not have the time to thrift and threw clothing away because they did not know where to send the clothing. Hence, not only was there an informational barrier to customers, but there was also no incentive to pursue sustainable paths in fast-fashion industries. Therefore, with this new perspective and problem focus, our project will aim to provide consumers with the tools to overcome these two barriers.

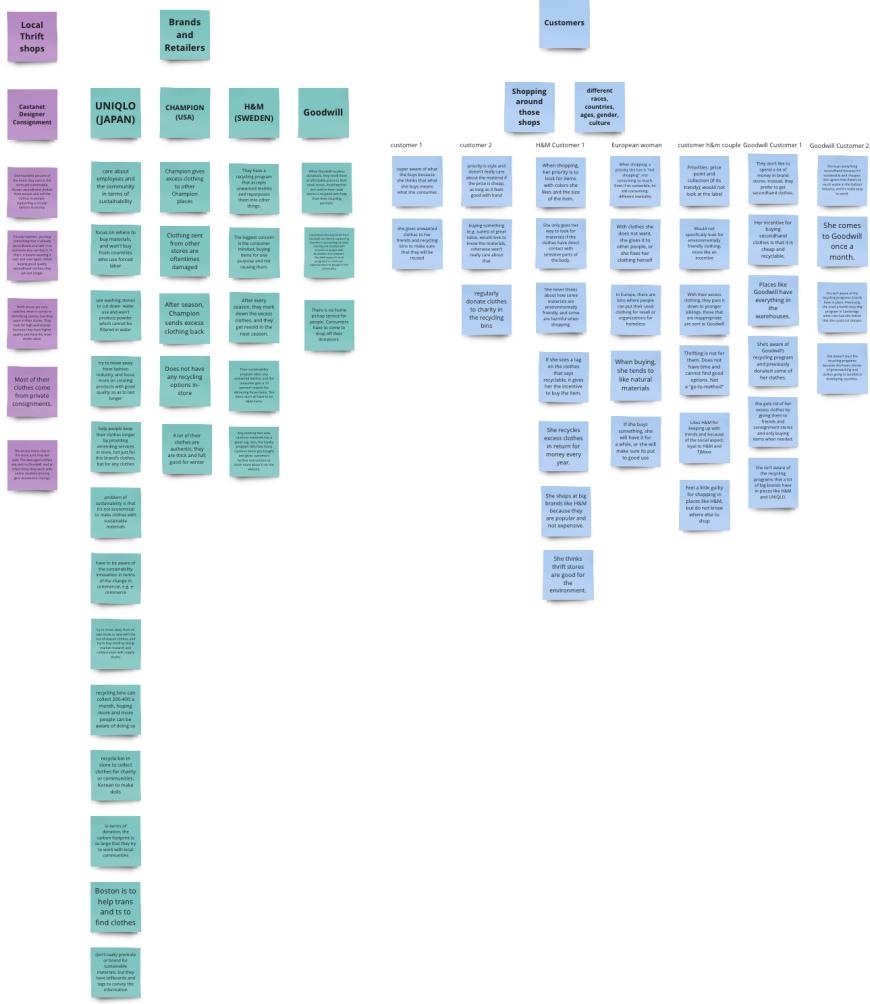


Figure 7: New Data Observations

Final Formative Stakeholder Analysis

Project stakeholders: The direct stakeholders we will emphasize in this project are fast-fashion retailers and their consumers, while the indirect stakeholders will be thrift stores.

The brands, as retailers, aim to sell new clothes for each season while maintaining their value of showcasing the brand image to attract more consumers. Their concerns include how to change customers' mindset who would buy one item for one purpose and not reuse it, the higher price for making clothes using sustainable material, and how to deal with excess out-of-season clothing. Brands such as Uniqlo have already used some methods to achieve their goal and solve problems. For instance, they provide tailoring services to deal with ill-fitting clothing for people. Besides, they provide recycling bins in stores to recycle clothes, starting from recycling Uniqlo-only clothes to any attire. Moreover, dealing with the supply chain can also prevent the brands from producing more clothes than can be sold. We can see a lot of billboards and tags indicating recycled material in fashion stores, including Uniqlo and H&M.

For the customers, on the other hand, just as mentioned above, their mindset is closely tied to their goal: the need for clothing. They buy clothes because of the style and color instead of whether the material is recycled. Sustainability while buying new clothes is one incentive but not the priority. However, regarding their value, they still think sustainability is essential to protect the environment. Most of them have shared the experience of dealing with unwanted clothes at home by giving them to friends and family members, donating to charity, or recycling them. However, when asked if they know that retailers also provide recycling programs, many haven't heard about this or participated in it. The barriers are mainly a lack of information on which brands offer these services and the fact that bringing unwanted clothes to stores is troublesome for them.

For thrift stores, their goal is to recycle clothing circulating in communities. They buy used clothing and sell it for cheap prices. Their concerns include presenting clothing without stains, tears, or any major damage. A Goodwill manager stated, during our interview with him, that they first check if clothing is actually in good condition and leaves clothing up for sale for a long time. However, once more inventory is put on display, unwanted items are sent in large pallets to warehouses where they are recycled into textiles. Furthermore, thrift stores also promote sustainability options by providing locations where consumers can drop unwanted clothing. Hence, thrift store locations and their programs can help fast-fashion consumers recycle clothing in addition to fast-fashion retailers' programs.

Problem Statement

Problem statement: A problem that loyal consumers who shop at fast-fashion retailers encounter is an attitude-behavior gap* pertaining to textile recycling options and sustainability efforts from fast-fashion brands.

Project Moral Stance

Our values for this project are the awareness of consumption and the influence of clothing purchases on the environment, which we derived from the consumer interviews that we conducted. We realized that an attitude-behavior gap mainly exists among the consumer group. Consumers are concerned about the environment and are willing to engage in sustainable behaviors. Still, engaging in these activities requires consumers' awareness of consumption and the influence their purchase decisions have on the environment. We are honing into both of these values to increase consumers' involvement in making sustainable fashion choices. Even though we as consumers realize how important it is to shop sustainably, we don't have the information to act on it. According to research Bain & Company conducted on how brands can embrace the sustainable fashion opportunity, they found that approximately 65% of fashion consumers care about the environment. Still, only a few prioritize sustainability in their shopping experience regularly. Our project tackles the difference between what consumers say and what they do – also known as the **attitude-behavior gap***.

Sustainable action requires extra effort, such as collecting the right information and delivering excess clothes when appropriate. Based on the consumer interviews we

conducted, it is evident that it's easier for consumers to reduce excess clothes through donation or reuse than it is to check labels and investigate a brand before making a purchase. For this project, we aren't mainly focusing on producing higher-quality and durable clothing because we have minimal access to figuring out what materials make clothes more durable and better understand the wide range of materials different brands use to recommend a better alternative. Although we understand that higher quality and durable clothes have more chances of more resale and reuse opportunities, we are prioritizing how we can close the attitude-behavior gap and accelerate sustainable shopping experiences. With our technology intervention, consumers can distinguish between sustainable and unsustainable items and motivate their process of recycling items more meaningfully.

A potential unintended consequence of our project, which would not support the values above, is persuading consumers to recycle their clothing to recycling programs from fast fashion industries, rather than thrift stores, like Goodwill. This might lead to thrift stores not having good inventory to sell, which would affect the disadvantaged consumers and workers in thrift stores. And since our product will potentially not be easily available to disadvantaged individuals, then these individuals may be left without as many clothing options as before. To avoid this from occurring, our project is focussing on promoting thrift stores, such as Goodwill, in addition to fast-fashion retailers' recycling places/programs in our product. Hence, our product will inform users about recycling options in various stores, as well as inform users about sustainability programs, benefits to communities, and incentives to recycle.

Milestone 4: Product Concept Candidates, Generating & Testing Hypotheses

Product Concept Ideas

1. A map-based application that shows drop-off locations where users can recycle clothing in exchange for coupons for a clothing store.
2. A social media app where users can interact with other users and trade their unwanted clothing with other users (for money), retailers (for coupons), and thrift stores (for good feels).
3. An information app that can display the textile sustainable programs in use for fast-fashion retailers and thrift stores. The information would include the company motto, mission statement, phone number, and locations.
4. An rewards application that rewards users when recycling their clothing to recycling programs and thrift stores. Every time you recycle and are verified by a retailer or thrift store, you gain points. Once you have enough points, you can get discounts on your favorite products or restaurants.
5. An interactive application that allows users to see the process of cloth recycling, and see what their recycled clothes become after recycling them. It would teach users about recycling, as well as give them opportunities to recycle by showing stores recycling programs and sustainable products.
6. An online platform helping to collect and deliver clothes from customers to retailers.
7. An interactive map helping customers to find recycling spots including thrift stores, retailers, donation centers, and recycle bins, aiming to make the recycling information available and transparent.
8. An online social community where you can add your friends and family members to recycle clothes together as a family group while competing with other family groups to see who recycles the most clothes per month.
9. By scanning clothes with green tags and buying them, users can gain rewards such as discount coupons from that retailer.
10. Customers who recycle the most amount of clothes to a certain retailer can get a coupon from that retailer, e.g. a 5% discount for buying any clothes, and a 10% discount for buying clothes made of recycled materials.
11. Information/news/stories/tips about how to reuse clothes, e.g. people can share how they turn an unused coat into a cat's bed.
12. eCommerce platform for excess clothes
13. An app that tracks after a consumer makes a purchase and gives them the option to remind themselves of recycling the item after they use it for months and don't need it anymore consumers scan an item when thinking about making a purchase and it lets them know how the item was made
14. A platform that matches consumers with second-hand stores
15. Every store adds information about their recycling programs all around the store

Ideation Process

After individual brainstorming, the team had a meeting to share our ideas to come up with four distinct concepts. In this process, we found that there were some connections and similarities in some of our ideas generated. As a result, by finding and combining similar ideas in Miro, we came up with four distinct concepts based on the individual ones.

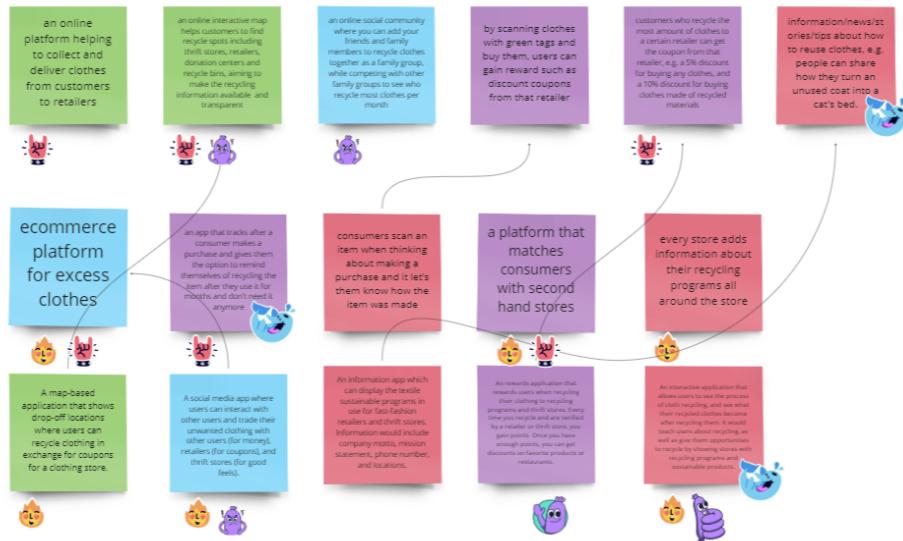


Figure 8: Ideation and Discussion on Miro Board

Product Concepts

Product 1: A map-based online application with delivery service

This product is an online interactive map, which helps customers to find recycling spots including thrift stores, retailers, donation centers and recycle bins, aiming to make the recycling information available and transparent. To be specific, users can filter different locations based on distance (considering convenience), incentives (mainly provided by fast fashion retailers and brands), most popular spots (where customers tend to give more trust), etc.

Besides, users can also require delivery options if they collect clothes weighing more than a certain amount of kilograms. This feature aims to solve the problem mentioned by more than one-third of the consumers that we have interviewed, that is, it is troublesome for them to bring the clothes to certain spots. As a result, delivery options including those provided by retailers and brands, recycle centers, or self-required ones, have different requirements in terms of the minimum weight of clothes, distances, available pick-up time, costs, etc. Users can decide which one they wanna use based on their own considerations. Instead of letting customers find out where to drop off clothes and the recycle spots transport the clothes to warehouses, this feature also aims to streamline this process by reducing the middle collecting spots and directly bringing the clothes from consumers to warehouses.

After finishing recycling, the users can also check where their clothes go, and what they turn out to be.

Product 2: An online social community app where users can exchange unwanted clothes and share information about where to recycle clothes

This product is an online social community app, that aims to provide a platform for users to interact with each other in terms of fashion sustainability.

One important feature of the app is the forum page, where consumers can share information about nearby recycling spots, recycling events, recycling ideas (for instance, how to self-tailor the clothes), etc. This feature can help to make the information available to more people and encourage people to participate more in these programs.

Another important aspect of this app is to provide an exchange platform for customers to sell and buy unwanted clothes, as a virtual market. Individual customers can sign up for the app and create a personal virtual store to sell unwanted clothes at home instead of bringing them to other recycling spots. Besides, customers can also surf the platform and contact a certain seller for buying second-handed cloth. All of the specific information in terms of how to pay, how much the cloth costs, and how to give the cloth to the buyer, will be communicated by individual consumers.

Product 3: An interactive information application where users can learn about textile recycling, view the progress of recycled clothing, and learn about retailers' recycling options

This product involves an interactive information application whose main purpose is to provide information about textile sustainability and recycling programs.

One important feature the application will have is a news/tips section pertaining to recycling one's clothing. This information can involve new programs for textile recycling, as well as keeping the user updated about sustainability efforts across the world. Also, this update/home section would involve daily tips as to how users can practice sustainable options.

In a different tab of this product, the application would have an interactive video of what happens to recycled clothing. That is, the user would be able to see what happens to recycled clothing: from being left at retailers, to being shipped to warehouses, to being deconstructed to create sustainable clothing/products which are then resold at newer stores. This tab's goal would be to provide a visual representation of the recycling process to users.

The last important tab of this product would involve learning about the recycling options around the user's location. That is, the user would be able to view the sustainability programs from fast-fashion retailers and thrift stores (including the name of the store, their mission statement, their contact information, and practices in supporting sustainability).

Therefore, this product would only provide helpful information to users about textile sustainability programs and practices.

Product 4: An application that matched users with places to recycle their clothing

Based on user interviews, we realized that consumers care about being sustainable, but there needs to be more convenient access, whether it does not know how to recycle, what can be recycled, or where to go. We want to build a platform that customizes the consumer's experience, from buying clothes to recycling them at appropriate locations. The platform prompts the consumers to input their preferences (options include: sustainability bar, types of clothes looking to buy, brands, second-hand, get connected to recycling program) and it gives them recommendations after the questions are answered. Brands or stores are able to reward the consumer if the consumer chooses to recycle an item. Incentives can range from coupons, reward points, or getting verified on the platform by brands/stores. At the store, consumers are able to scan any item using our platform to get details of the item's sustainability. This solution addresses the problem statement by informing the consumers what they are buying, which might influence their decision of wanting to buy something or look for alternatives.

Product Concepts Hypotheses

Product 1: A map-based online application with delivery service

Assumptions	Hypotheses
Many retailers, brands and other recycle spots would love to provide the delivery service; while customers would love to pay for delivery service fees	Customers will find recycling clothes much more convenient
Customers would like to download this app for recycling clothes	Retailers and brands can help to promote fashion sustainability by letting more customers learn about their recycle programs and find it convenient to participate in

Product 2: An online social community app where users can exchange unwanted clothes and share information about where to recycle clothes

Assumptions	Hypotheses
Customers will find it hard to trust someone else on the platform and worry about being cheated	Customers will find clothes they want when they surf the platform instead of spending much time at local thrift shops
Users find it troublesome to upload images for each of the clothes and would rather throw them all to the	Customers feel motivated about recycling clothes because they can meet new friends in this process

recycle centers	
Users are reluctant to download an app for recycling clothes and they might choose to do that on some existing social apps	Users find it interesting to share ideas about fashion sustainability and would love to organize some small in-person events in terms of Sunday second-hand markets and workshops about turning an unwanted cloth to a bag/pillow

Product 3: An interactive information application where users can learn about textile recycling, view the progress of recycled clothing, and learn retailer's recycling options

Assumptions	Hypotheses
Users will have time to see the video and have no idea how the process is	Users will be engaged with the interactive videos concerning the recycling process
Users do not know about clothes recycling programs around them	Users who want to learn about nearby recycling options will use the third tab's information
Users are interested in worldwide steps for sustainability and less waste in the environment	Users who want to learn more about recycling options will enjoy the info/update section on the first tab

Product 4: An application that matches users with places to recycle their clothing and buy sustainable clothes

Assumptions	Hypotheses
Our platform is intuitive.	All types of consumers will be able to adapt to the usage of our platform.
All the consumers will be happy with recommendation and will consider our recommendation highly over their instincts of what they want.	The platform will be able to meet every user's wants and gives helpful recommendations based on the information given by the users.

Product Prototyping

For our prototypes, we created Figma outlines for two product concepts. These both show the general appearance and usability of the product. Link to the Figma page in the Appendix.

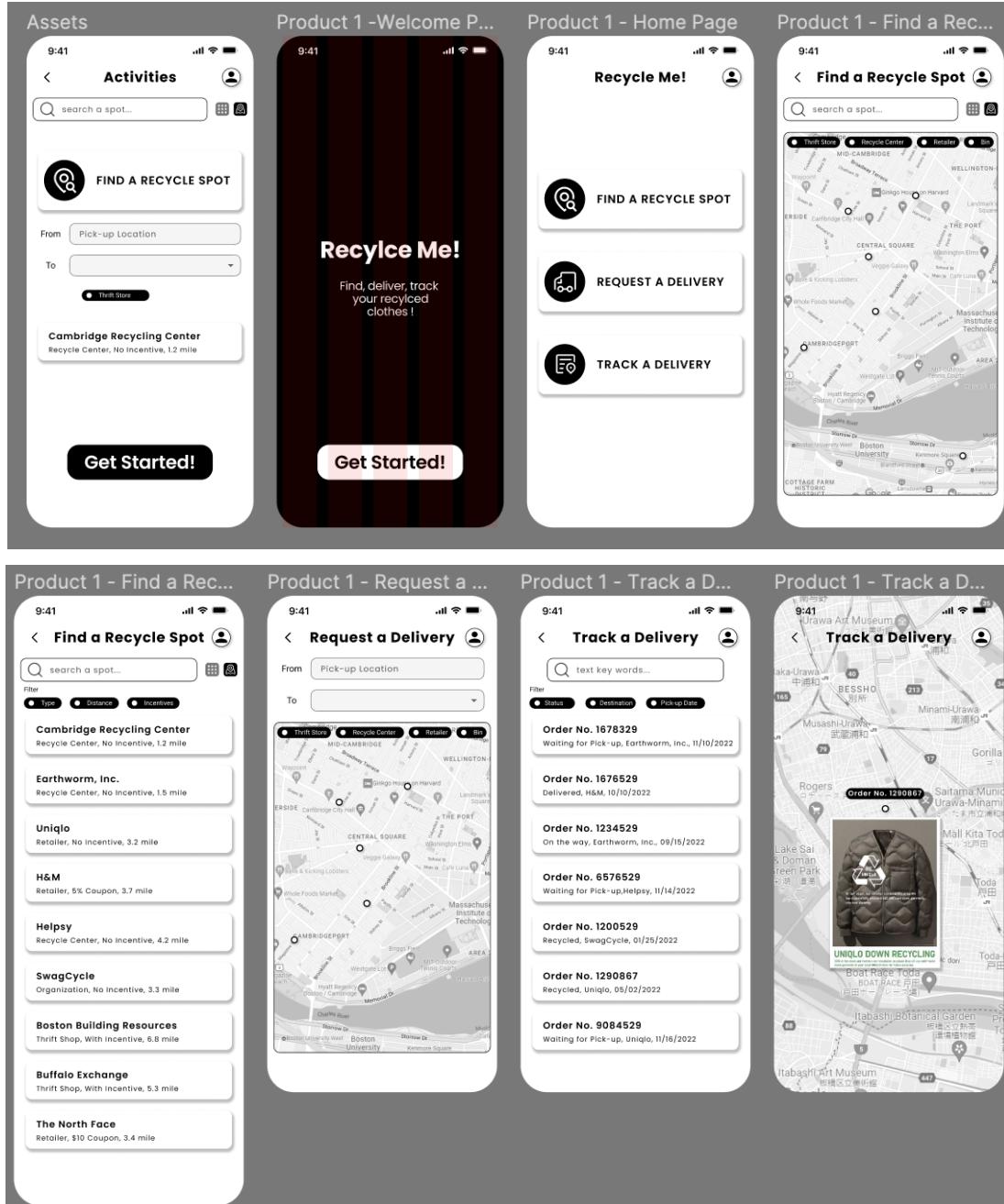


Figure 9: Product Concept for Map-based Application

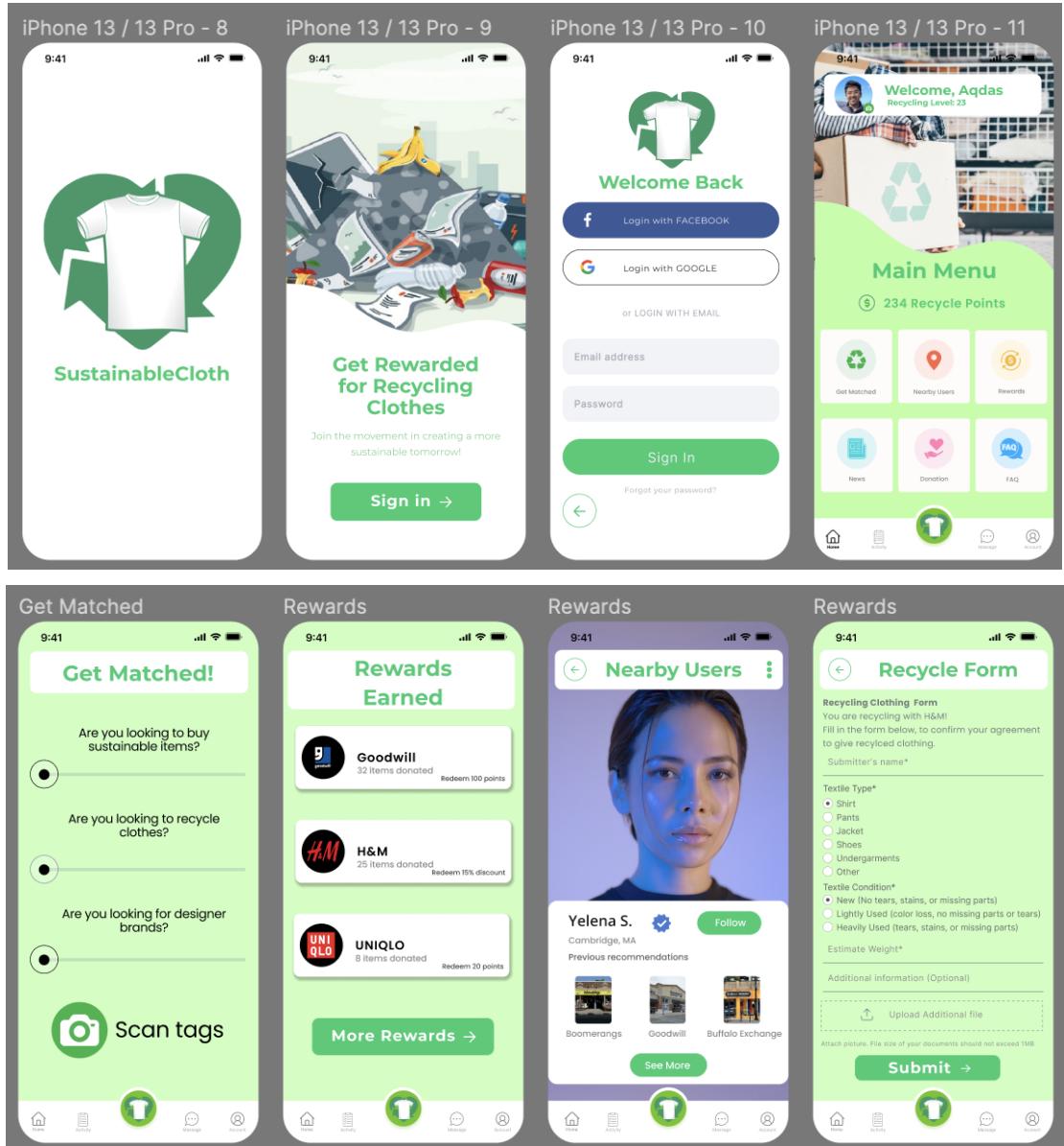


Figure 10: Product Concept for Match-Reward Application

Milestone 5: Finish Testing Product Hypotheses, Finalize Product Concept, & Start an Interactive Prototype

Figma Prototype Link

Link:

https://www.figma.com/proto/QfLGmMv0j7un8YL8z9AEcE/CS79_Project-3?page-id=0%3A1&node-id=121%3A468&viewport=455%2C-151%2C0.12&scaling=scale-down&starting-point-node-id=121%3A468

Collecting Data

For testing our hypotheses, we conducted seven user types of research by showing our interviewees the two products that we built for milestone 4. Since we were quite clear that our final product would be the one that combines features from both prototypes, we conducted the user test mainly to find out the most attractive features for users instead of comparing these two prototypes.

When we reached out to users, we mainly focused on reaching out to people living in the US and in different ages, races, and occupations. And finally, we concluded our user research results on the Miro board. We divided the seven features into three categories: like, maybe, and dislike when we interviewed the users. Besides, we also recorded their backgrounds and other ideas they had.

The detailed documentation for each individual will be in the appendix.

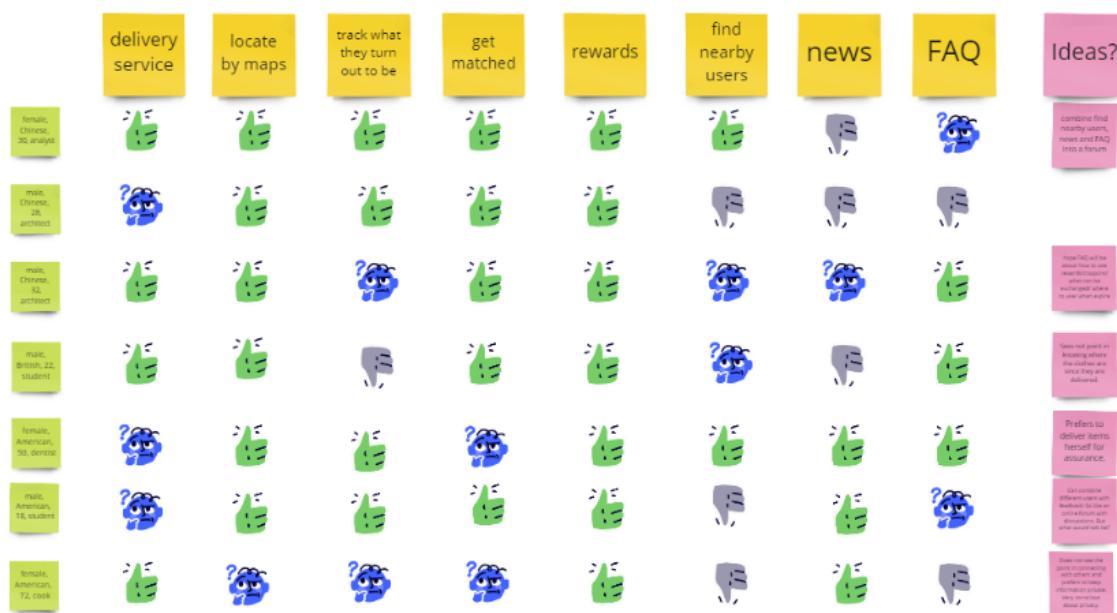


Figure 11: Documentation of user test

Result Synthesization

Based on the user research conducted, we decided to keep five functions for our final product: delivery service, locating various recycle spots on maps, tracking what the products turn out to be after recycling, getting matched to find proper recycle spots, and gaining and redeeming rewards after finishing recycling. And we decided to get rid of these features since most of the users indicate that they won't use them: find nearby users, news, and FAQ pages. However, it is interesting to find that some users suggest having one feature similar to a forum instead of the news and FAQ page. This idea perfectly matches our initial idea of using this App as a platform for users to get connected in real life. For instance, they can share their own recycling stories, their favorite recycling spots, etc. What's more, they can also suggest hosting some in-person cloth recycling markets or community events especially when it is the move-out season for university students or leasing apartment residents.

During last week's studio, we were advised to not have many features in our final product. Yet, mostly all of the user research conducted presented the attractiveness of the map, delivery, and rewards portions of our prototypes. Hence, rather than focus on too many things, we made each aspect that appealed to users their own boxes on the home page of our application. We also streamlined the news, FAQs, and nearby-users sections to one community forum, similar to Reddit but pertaining to textile sustainability. We made the rewards section have food and sustainable-clothing discounts. While initially we were considering just having food discounts, many users preferred the idea of having discounts on sustainable clothing stores. Hence, we opted to combine both in the rewards section. Regardless, most users interviewed appreciated various aspects that both prototypes had stated they would use the app and learn more about sustainability if this application were available.

Final Product Concept

Our user test results demonstrate that consumers need to recycle their excess clothes. Still, the recycling process is uncertain regarding where the items are recycled and how different brands support sustainability efforts as their brand persona. During our interviews, we also identified that some consumers avoid recycling their excess clothes due to the lack of transportation assistance and the time needed to find the right recycling places for the items they want to give away. Another group of interviewees also did not trust the recycling places because they thought their items would go in the landfills regardless. Consumers aren't aware of what recycling options would be best suited for their excess clothes and how they can benefit from recycling branded items. Some brands don't advertise their recycling programs and the benefits that exist for consumers who recycle their items. Consumers are more likely to recycle if they are incentivized in some way.

Recycle Me provides a personalized recycling service to the consumers on the platform. Consumers can answer a short survey that collects information about the type of textile they want to recycle and its condition (options are new, lightly, and heavily used). They also can scan a tag (in-store or already bought) to match that specific brand's

recycling options. After they pick a recycling program from their matches, finding a recycle spot on our platform allows the consumer to input a pickup and the location of their match to receive transportation assistance. All the matches provide the best recycling option based on the consumer's current location and the item they want to recycle. Once the driver picks the items, they get assigned an order number. The order number is to help track the items. Consumers can see if their items were delivered at the right location and where the organization/brand shipped the recycled items.

Our platform also provides a world map that puts a marker on the map where items were shipped to allow the consumers to see their recycling stories and share them with their friends and family to encourage them to join sustainable efforts like theirs. Additionally, brands/organizations will provide incentives to the consumers who go through the process of recycling clothes. The incentive varies depending on the matches. Some brands will provide rewards points that can be used to redeem points at their stores for discounts, or they can redeem their points at local restaurants that support sustainable efforts in fashion.

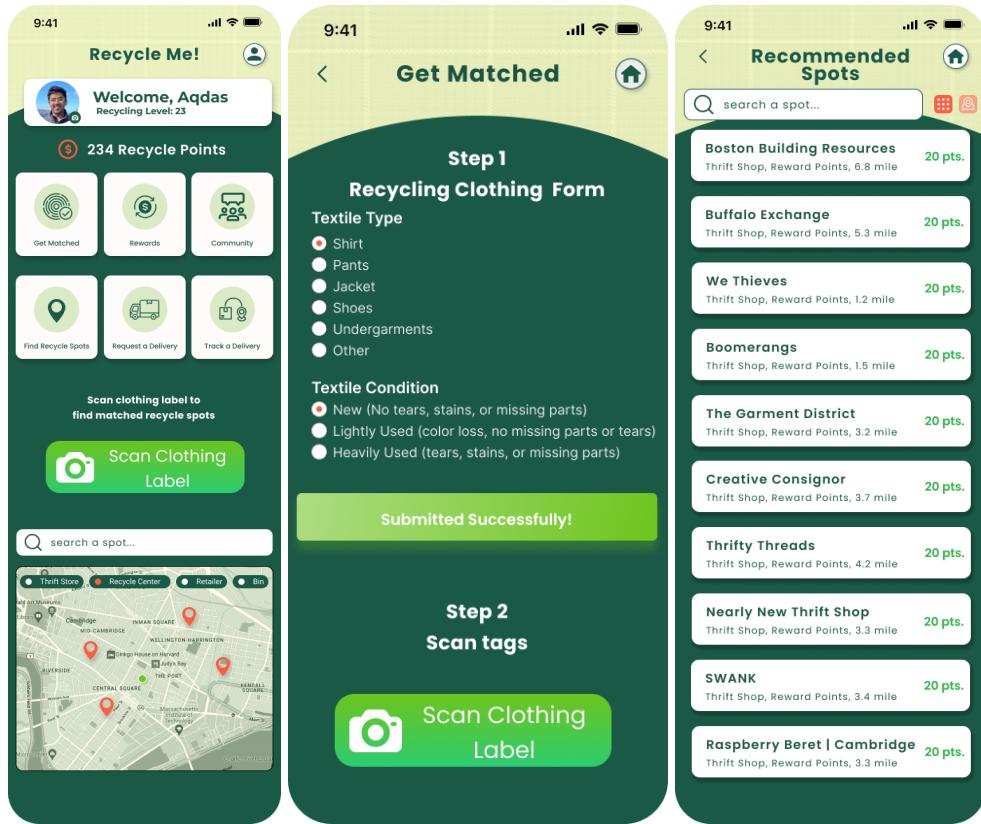


Figure 12: Recycle Me Homepage, Getting Matched, & Recommended Spots

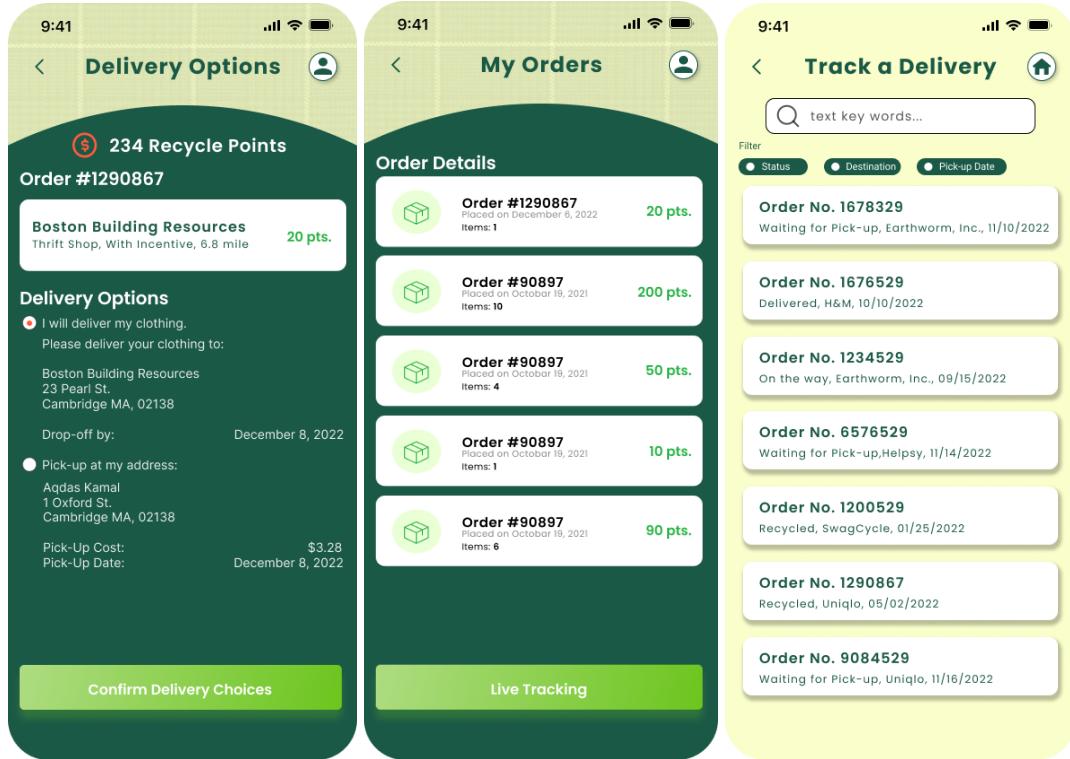


Figure 13: Delivery Options, My Orders, & Track Deliveries

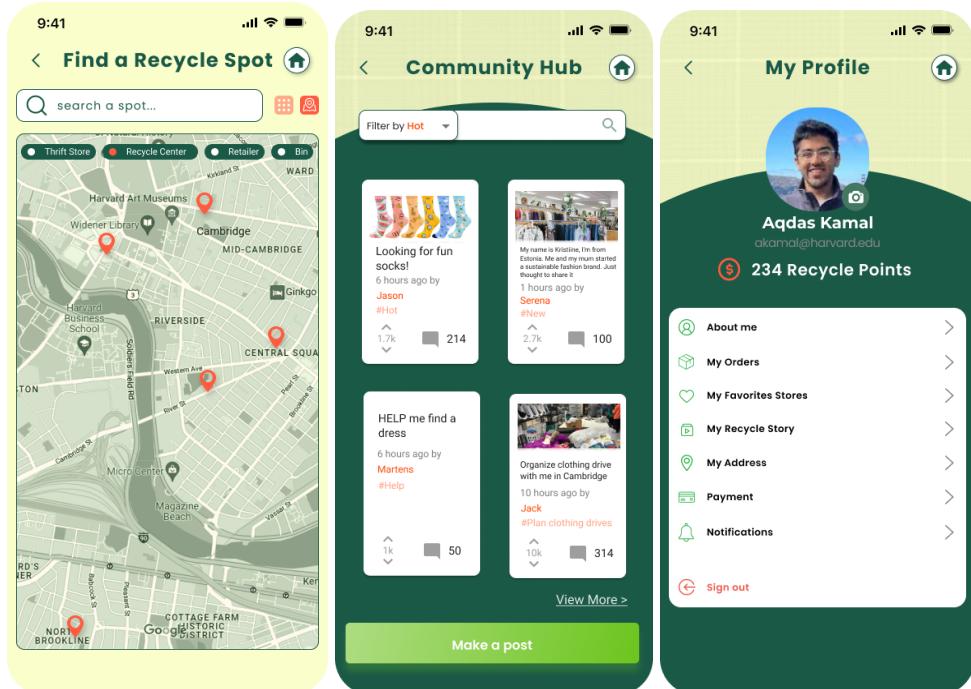


Figure 14: Recycle Spots, Community Hub, & My Profile

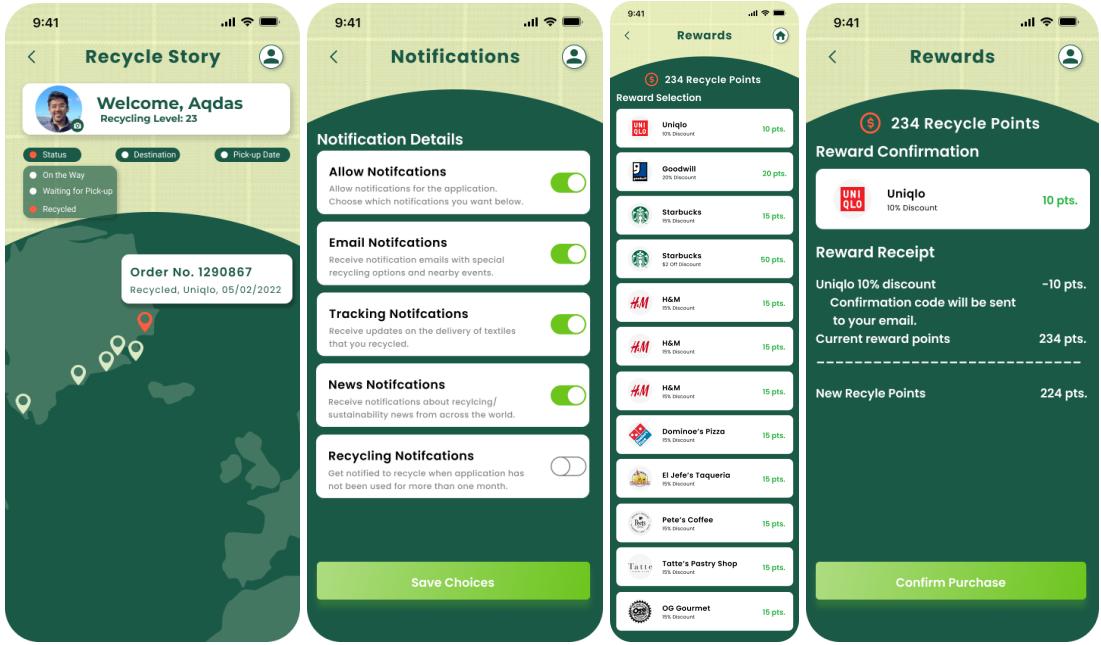


Figure 15: Recycle Story, Notifications, & Rewards

Interactive Demo

Scenario 1: Aqdas was asked by a few college students when he was at UNIQLO if he knew of their effort to make fashion more sustainable. He said he cares about the environment but doesn't have time to go out of his way to learn about how brands promote sustainability. When recycling his excess clothes, he tends to go the easiest route: to give them to family members or throw them out in the trash. However, he knows such an attitude is harmful to the environment, so he decides to try Recycle Me's to get matched features to get a personalized recommendation of where the items he has can be recycled. He answers the conditions of the textile and the type of clothes we want to recycle. This data allows him only to get recommendations that will work best for him. He knows that for this recycling initiative, he will be incentivized which drives him to want to promote this application to members of his family.

Scenario 2: Aqdas is afraid to pursue the option of recycling clothes through an organization or a brand's recycling program. He doesn't like the idea of not being able to see where his items were delivered and where it is going next for what purposes. He uses Recycle Me to track his items. He is assigned an order number that allows him to track. He can also see the status of his order.

Milestone 6: Creating an Interactive Prototype, Analyzing the Solution for Indirect Impacts, Evaluating Key Decisions in Light of Moral Stance, & Final Presentation and Report

Figma Prototype Link

Link:

https://www.figma.com/proto/QfLGmMv0j7un8YL8z9AEcE/CS79_Project-3?page-id=0%3A1&node-id=242%3A5427&viewport=400%2C-3%2C0.11&scaling=scale-down&starting-point-node-id=242%3A5427

Feedback from Clients

We presented our final product concept to our clients in early December. We held several interviews with people of different backgrounds and occupations to obtain various comments and suggestions. In general, many interviews expressed great engagement with the final product concept. People enjoyed the simplicity of the entire product. One noted that the Getting Matched feature was intuitive and made the whole process of finding where to deliver used or unwanted clothing easy and helpful. Furthermore, people thought the linearity of Getting Matched was smart and flowed well with the application's purpose. On a similar note, people loved the Community Hub feature, noting that it was helpful in not only asking questions about the app and getting answers from other users and app developers, but also for learning new sustainable clothing programs, suggestions, and advice from users across the platform.

One critical impact that was present in the interviews was the engagement of recycling from people who do not regularly recycle their clothing. Many users noted that the rewards feature is a powerful incentive for people to recycle. When asked how often they would recycle their clothing through this application, all of them stated that they would always recycle unwanted items through the application for rewards, as well as for donations to thrift stores (which are included in the app). Another highlight of the application was the ability to get notified about recycling. Interviewees stated that they often forget they have certain applications, so notifications about sustainability and recycling would help them know when they should clear their unwanted textiles.

There were suggestions from users in terms of how to make the final product better. Two users stated that they would like to have the option to receive discounts from stores that do not have a recycling program. While this idea would attract more users, it would deter from the mission of the application, which is to help stores that have existing recycling programs. Perhaps there is another way to incorporate other stores, but it would be through additional features in the application. Several users also suggested giving the users the option to customize their homepage and theme, so that they could put features most important to them at the top, as well as making the entire application more visually unique and colorful. While the product could incorporate more aesthetic options, users stated that they would still use the application regardless. Overall, interviewees would like to see the final product concept become a reality.

Indirect Stakeholder Impacts

The employees work at all levels in the fashion business. They work in design, retail, marketing, and other departments. For our product, it will affect the employees in the following ways. First, this product has a feature of clothing delivery, which means that the fashion industry will need more employees in the delivery department. Second, this product motivates more consumers to recycle clothes regularly. In that case, the fashion industry companies might need more employees in the recycling department, for instance, researching ways to recycle clothes, assisting consumers in recycling programs, etc. The marketing department will also work on promoting the company's sustainability actions in the fashion industry. However, we are not sure if there will be less production of new clothes or how the recycling programs will affect the production of new clothes. Employees might receive training in making more sustainable clothes or better quality so that consumers will use them longer, and it will be easier for companies to recycle.

Manufacturers will be affected by our product because our product provides information about the item a consumer wants to recycle. Manufacturers must ensure that the material used to make the product is documented. The process of recycling items varies based on how the item was made. Some manufacturers use harmful chemicals for long durability, but if it by any chance goes in the wrong direction when recycling it, it can be dangerous for the environment. Recycle Me provides as practical information as possible to our consumers on the platform. This is an extra step that manufacturers will have to take as they are making decisions about what to use to make a product and what useful information is necessary for consumers to receive when deciding where to recycle items.

Indirect & Unintended Consequences

Card 1: Scale and Disruption - Mother Nature



Our main goal of the product is to contribute to the environment by motivating consumers to realize how their behavior would impact the environment by encouraging them to recycle clothes. In this case, the environment will be happy with our product.

However, the most unsustainable behavior of our product is that consumers can get coupons or discounts by redeeming their recycling rewards, which means that we are encouraging them to buy more new clothes in some sense. However, we decided to do this because we want to pair with more retailers and brands to collaborate with us.

Card 2: Scale and Disruption - The Radio Star



This product might make those who work at recycling centers lose their jobs. By providing the consumers with information about possible recycling spots, consumers are likely to recycle their clothes at those places providing rewards, for instance, thrift shops and retailers. In this case, recycling centers that usually don't offer rewards will gradually lose their consumers. On the other hand, brands and retailers will need more employees to deal with recycling programs in all aspects. Besides, the current self-organized second-hand markets will be affected, including both in-person and virtual ones. For instance, people who used to sell unwanted clothes on Facebook might choose to use our product because it is much more convenient.

Card 3: Usage - The BFFs



When we interviewed the customers, quite a few indicated that they usually give their unwanted clothes to their family members and friends. With the appearance of this product, the behavior of sharing clothes with others might be affected because it is super convenient for them to recycle clothes by using our App, and they can also get rewarded. On the other hand, our app's community feature connects people in real life. Users can propose in-person second-handed markets by posting their ideas on the platform, which is another way of interacting with others in real life.

Product Concept in Light of Moral Stance

Looking back to the moral stance we declared in Milestone 2 and connecting it to the final product concept, it definitely wasn't easy to find the right approach to tackling this issue from all facets of it. For our final product, our overall goal was to provide the information consumers wanted to get to make the best decision. We didn't go the route of finding out how manufacturers are making changes in their production to avoid using harmful materials for the environment. Since we are also consumers of fast fashion, we decided to approach consumers of those fast fashion brands as our core audience for our final product. When we conducted consumer interviews, many of the comments we received from them applied to some of the actions we take in our shopping experiences. For example, if our recycling efforts involve incentives, this becomes the driving force behind our decision to want to recycle and be more sustainable.

One of the unintended consequences we realized while adding the reward feature as part of our final product is that giving consumers reward points to buy more clothes needs to address the issue of reducing excess clothes. Consumers always have the desire to want more. To reduce overconsumption, we are also allowing consumers to redeem their award points in local restaurants that support fast fashion brands' efforts to be sustainable. Overall, our product wants to make appropriate information as accessible as possible to our consumers. Recycle Me exists to ensure consumers aren't part of the bigger issue of waste in fashion.

Acknowledgments

We would like to express our greatest gratitude to Professor Krzysztof Gajos for his lecture presentations that gave us the tools, questions, and guidelines for embarking on this project. Throughout the semester, we were not only intrigued by the examples of designs with faults but were also inspired to pursue something that helped people and the environment. Without him, we would not have been able to realize the importance of designing useful and usable interactive products.

We would also like to thank the teaching staff and students in the class. The teaching staff shared their incredible knowledge of design, Figma, and personal experience. They also shared interesting videos and articles for weekly discussions that allowed us to see how design is continuously growing. Our fellow peers have also pushed us throughout this project by submitting questions and comments that made us realize holes in our project's development and things we should address.

Lastly, and most importantly, we are grateful to our studio Teaching Fellow, Aqdas Kamal, who guided us through the entire project. From the commencement of the semester, Aqdas paired the three of us together and gave critical feedback on projects that allowed us to grow as designers and innovators. If it were not for Aqdas's comments, critiques, suggestions, and kindness, our project would not have grown as it has through each milestone and we possibly may have never learned how to create a usable and useful interactive product.



Figure 16: Gratitude from Three of a Kind

Appendix

Assigned Roles

Team Contract: [Project 3_Team Contract](#)

Assigned Roles

Week 1:

- Qingyu: Writing/Research
- Mahbuba: Writing/Research
- Mateo: Editing/Submission

Week 2:

- Qingyu: Interviewer/Research/Pictures
- Mahbuba: Interviewer/Research/Pictures
- Mateo: Interviewer/Editing/Submission

Week 3:

- Qingyu: Interviewer/Writing/Pictures
- Mahbuba: Transcribing/Writing
- Mateo: Interviewer/Writing/Editing

Week 4:

- Qingyu: Figma/Writing
- Mahbuba: Figma/Writing
- Mateo: Figma/Writing/Editing/Submission

Week 5:

- Qingyu: Figma/Writing
- Mahbuba: Figma/Writing/Editing/Submission
- Mateo: Figma/Writing

Week 6:

- Qingyu: Figma/Writing/Presenting
- Mahbuba: Figma/Writing/Presenting
- Mateo: Figma/Writing/Interviewing/Presenting/Editing/Submission

Initial Problem Areas

Problem Area 1: Pandemic Preparation and Response

- A description of the problem area:
 - Covid-19 has been living with us for over two years. We've seen multiple outbreaks of newly emerging diseases over the past 50 years, including several other coronaviruses. It happens as predictably as lightning starting a forest fire. It is a long game for human beings to fight against the pandemic, which we have already learned through Covid-19. As a result, it is critical for human beings to think smart and move fast to respond to these diseases.
- The population(s) you wish to target:
 - People living in the US

- Design inspirations (examples of specific questions or problems, statistics) that will help the reader see more concretely what kinds of things could be improved:
 - How can mobile technology provide people with knowledge about the pandemic?
 - How can mobile technology keep people updated with the latest news about the pandemic?
 - How can mobile technology help people learn if they have been in touch with someone who has got COVID?
 - How can mobile technology form an online community for people who have got COVID to share their experiences (i.e. of how to recover soon, which masks are of good quality)?
 - How can mobile technology remind people of health tips (i.e. reminding people of wearing a mask)?
- Major products/solutions already targeting this problem area (that's your competitive analysis); aim for about 3-5 diverse examples that show the true extent to which this problem area has been addressed by others. Keep your eyes open for non-mobile or non-technology solutions that exist in that space. For each, explain briefly what specific problem the product addresses and how. Feel free to include screenshots or other illustrations if this helps to explain the product.
 - In the last two years, we have seen that different countries have their own ways of dealing with Covid-19 variants. However, it is increasingly essential for every single person to learn how to protect themselves and take care of their friends and family members. We should use COVID-19 as a starting point to learn about future pandemic preparation and response so that we won't leave the pressure merely to the government or healthcare systems. Instead, everyone is involved in this fight. This project targets the current pandemic, in this case, COVID-19, but will be used as an example for any future virus variants, especially for vulnerable populations that tend to be more easily affected by the pandemic.
- Is there room for a technology-based intervention? Given what has been tried before, is there reason to believe that you can make a substantial positive impact with a technology-based intervention?
 - A technology-based intervention would help solve this problem. An application that warns and teaches people correct information about the virus would help many people with limited access to health facilities.

Problem Area 2: Waste in the Fashion Industry

- A description of the problem area:
 - The fashion industry is one of the most leading industries to cause substantial waste in the world. Approximately 92 million tons of textile waste come from the fashion industry. Every season, about 30% of the clothes that are produced are never sold. This waste projection will increase by around 60 percent from now to 2030. For example, in March 2018, the fast fashion powerhouse H&M reported 4.3 billion in unsold inventory. The root cause of

this problem is overproduction. Textile overproduction by these fast fashion companies produces harmful waste and is threatening the environment and communities around the world.

- The population(s) you wish to target:
 - Everyone
- Design inspirations (examples of specific questions or problems, statistics) that will help the reader see more concretely what kinds of things could be improved:
 - How can technology intervention help brands, designers, local businesses, and consumers reduce waste in the fashion industry?
 - How can technology intervention help the people producing the clothes not fall into the rabbit hole of putting unwanted fabric to waste?
 - How can technology intervention help consumers access clothes produced for sample or not suited for the current season anymore?
 - How can the technology intervention benefit organizations that host clothing drives to distribute winter clothing?
- Major products/solutions already targeting this problem area (that's your competitive analysis); aim for about 3-5 diverse examples that show the true extent to which this problem area has been addressed by others. Keep your eyes open for non-mobile or non-technology solutions that exist in that space. For each, explain briefly what specific problem the product addresses and how. Feel free to include screenshots or other illustrations if this helps to explain the product.
 - This problem has yet to be addressed as extensively as it should be. For example, some brands have aimed to reduce waste and emit less trash to landfills, however, many still produce large amounts of waste in trash centers. Another solution is thrift stores, where people can buy clothing others do not want/need anymore. Yet, the number of clothes they receive exceeds the amount they can sell. They usually ship the excess clothes abroad or waste them in situations like this. Other solutions include small projects that would send the clothing to homeless shelters, however, they have also not gained enough traction to become large-scale in cities and states.
 - On the producer side, there are waste management tools, however, these are more focused on monitoring the production cycle. On the consumer side, allowing customers to monitor the carbon footprint of what they purchase has also been common in stores, yet many shoppers disregard signs.
- Is there room for a technology-based intervention? Given what has been tried before, is there reason to believe that you can make a substantial positive impact with a technology-based intervention?
 - A technology-based intervention would help solve this problem. A technology-based intervention can fight against the fashion industry's linear model, which results in substantial waste in landfills. Our intervention values a circular system that values recycling and reclaiming of products.

Problem Area 3: Identification of Oneself

- A description of the problem area:
 - The problem area is about the identification of oneself. There are a plethora of instances where individuals have fake IDs to purchase alcohol, forget their driver's license, do not have their immigration status or visa paperwork on hand, and falsely claim to be someone else.
- The population(s) you wish to target:
 - The population this project is targeting is everyone.
- Design inspirations (examples of specific questions or problems, statistics) that will help the reader see more concretely what kinds of things could be improved:
 - How will voter fraud be avoided in the following elections?
 - Do people always carry their immigration/visa paperwork around with them all the time?
 - How can someone make sure an ID is secure?
 - What happens to individuals who forget their driver's license?
 - What is a secure way to know someone's disability status?
- Major products/solutions already targeting this problem area (that's your competitive analysis); aim for about 3-5 diverse examples that show the true extent to which this problem area has been addressed by others. Keep your eyes open for non-mobile or non-technology solutions that exist in that space. For each, explain briefly what specific problem the product addresses and how. Feel free to include screenshots or other illustrations if this helps to explain the product.
 - The closest thing that has tried solving this problem is Apple's Drivers license adoption into the Wallet app on iPhone. Other than that, most of the documents have been used as physical copies for most places. Apple's Drivers license feature was aimed to allow a seamless experience at TSA checkpoints when flying. It could potentially also be used for checking ID when being pulled over, but it has not gained the mobile traction across state governments to allow that to work.
- Is there room for a technology-based intervention? Given what has been tried before, is there reason to believe that you can make a substantial positive impact with a technology-based intervention?
 - A tech-based intervention would most definitely help users in all circumstances when traveling, from going to the food store to boarding a plane. Having all your personal documents with you through an app would help verify that you are indeed you, but can also allow fast and seamless updates to any document with cooperation from various federal and state agencies.

Interview Questions

People working in the stores:

- What initiatives are you taking as a clothing store/brand to support sustainability in fashion?
- What's a problem you face working in the fashion industry?
- How much awareness do you have about the materials used to produce the items you sell to your customers in the store?

- How do you think fast fashion affects this industry?

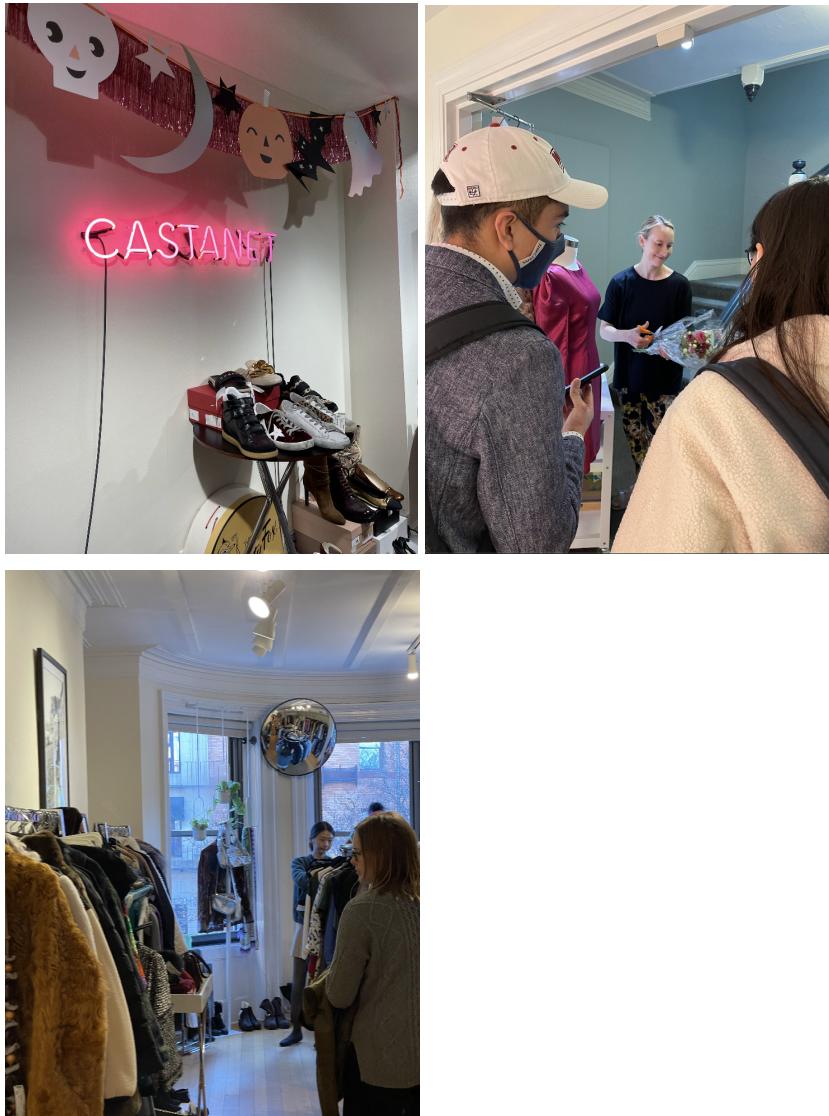
Consumers:

- When shopping for clothes, what's your priority?
- How can you tell if a fashion brand is sustainable?
- Do you find buying secondhand clothes more sustainable?
- What do you do with the excess clothes in your closets? How do you get rid of them?
- How do you think fast fashion affects you?

Observations from Interviews

Local Thrift Shops: Castanet Designer Consignment

- One hundred percent of the items they own in the store are sustainable. Accept secondhand clothes from people and sell the clothes to people— supporting a circular fashion economy.
- Circular fashion— you buy something that is already secondhand and sells it so someone else can buy it. In short, it means wearing it over and over again. When buying good quality secondhand clothes, they can last longer.
- Thrift stores are very selective when it comes to identifying clothes that they want in their stores. They look for high-end brands because they have higher quality and have the most resale value.
- Most of their clothes come from private consignments.
- The excess items stay in the store until they are sold. The damaged clothes are sent to Goodwill, and at other times they work with online resellers (money gets donated to charity).



Brands and Retailers: UNIQLO (JAPAN)

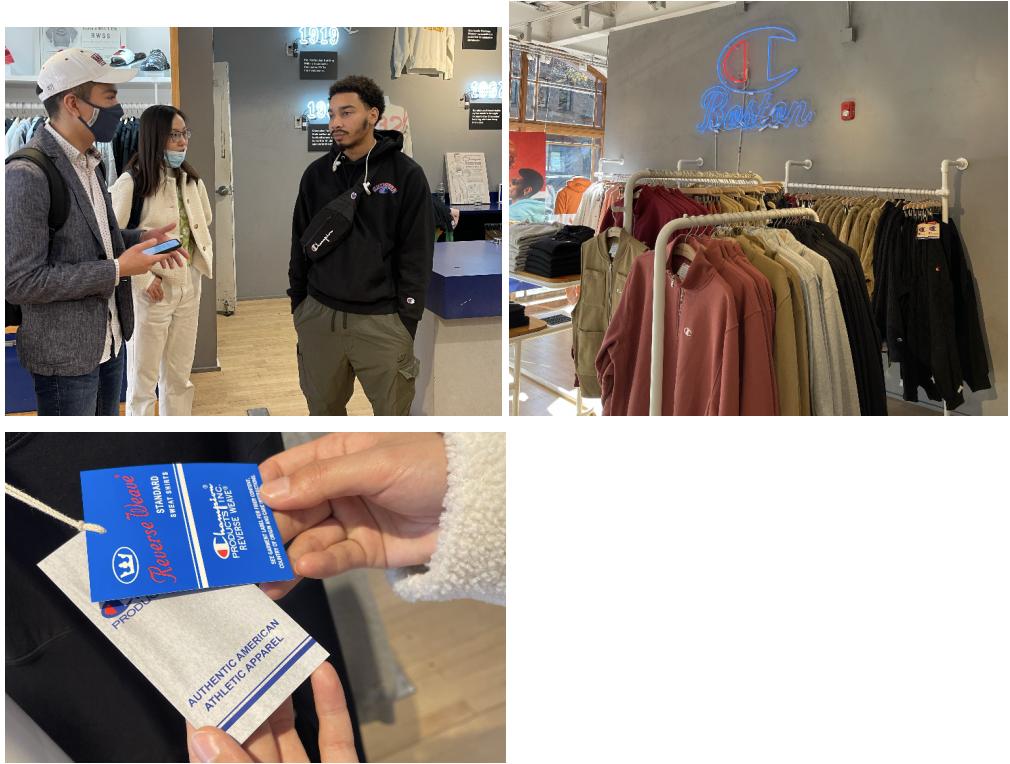
- care about employees and the community in terms of sustainability
- focus on where to buy materials, and won't buy from countries who use forced labor
- use washing stones to cut down water use and won't produce powder which cannot be filtered in water
- try to move away from fashion industry, and focus more on creating products with good quality so as to last longer
- help people keep their clothes longer by providing amending services in store, not just for this brand's clothes, but for any clothes
- problem of sustainability is that it's not economical to make clothes with sustainable materials
- have to be aware of the sustainability innovation in terms of the change in commercial, e.g. e-commerce
- try to move away from on sale mode to deal with the out-of-season clothes, and try to buy small by doing market research and collaboration with supply chains

- recycling bins can collect 200-400 a month, hoping more and more people can be aware of doing so
- recycle bin in store to collect clothes for charity or communities: Korean to make dolls
- in terms of donation, the carbon footprint is so large that they try to work with local communities
- Boston is to help trans and ts to find clothes
- don't really promote or brand for sustainable materials, but they have billboards and tags to convey the information



Brands and Retailers: CHAMPION (USA)

- Champion gives excess clothing to other Champion places
- Clothing sent from other stores is oftentimes damaged
- After the season, Champion sends excess clothing back
- Does not have any recycling options in-store
- A lot of their clothes are authentic; they are thick and full; good for winter



Brands and Retailers: H&M (SWEDEN)

- They have a recycling program that accepts unwanted textiles and repurposes them into other things.
- The biggest concern is the consumer mindset, buying items for one purpose and not reusing them.
- After every season, they mark down the excess clothes, and they get resold in the next season.
- Their sustainability program takes any unwanted textiles, and the consumer gets a 15 percent coupon for delivering those items. The items don't all have to be H&M items.
- Any clothing that uses cautious materials has a green tag. Also, the loyalty program tells how many cautious items you bought and gives customers further instructions to learn more about it on the website.



Customers: Different races, countries, ages, gender, and culture

- Customer 1 (UNIQLO (JAPAN))
 - super aware of what she buys because she thinks that what she buys means what she consumes
 - she gives unwanted clothes to her friends and recycling bins to make sure that they will be reused
- Customer 2 (UNIQLO (JAPAN))
 - priority is style and doesn't really care about the material if the price is cheap, as long as it feels good with hand
 - buying something (e.g. suites) of great value would love to know the materials, otherwise won't really care about that
 - regularly donate clothes to charity in the recycling bins



- Customer (H&M)
 - When shopping, her priority is to look for items with colors she likes and the size of the item.
 - She only goes her way to look for materials if the clothes have direct contact with sensitive parts of the body.
 - She never thinks about how some materials are environmentally friendly, and some are harmful when shopping.
 - If she sees a tag on the clothes that says recyclable, it gives her the incentive to buy the item.
 - She recycles excess clothes in return for money every year.
 - She shops at big brands like H&M because they are popular and not expensive.
 - She thinks thrift stores are good for the environment.



- Customer (UNIQLO (JAPAN))
 - When shopping, a priority she has is "not shopping": not consuming so much. Even if its sustainable, its still consuming; a different mentality
 - With clothes she does not want, she gives it to other people, or she fixes her clothing herself
 - In Europe, there are bins where people can put their used clothing for resell or organizations for homeless
 - When buying, she tends to like natural materials
 - If she buys something, she will have it for a while, or she will make sure its put to good use
- Customers (H&M)
 - Would not specifically look for environmentally friendly clothing, more like an incentive
 - With their excess clothing, they pass it down to younger siblings, those that are inappropriate are sent to Goodwill
 - Thrifting is not for them. Does not have time and cannot find good options. Not a "go-to-method"
 - Likes H&M for keeping up with trends and because of the social aspect; loyal to H&M and TJMaxx

- Feel a little guilty about shopping in places like H&M, but do not know where else to shop
- Priorities: price point and collection (if its trendy); would not look at the label



Goodwill Manager

- When Goodwill receives donations, they resell them at affordable prices in their retail stores. Anything that isn't sold in their retail stores is recycled with help from their recycling partners.
- Consumers who buy items from Goodwill are directly supporting the effort of providing job skills training and employment services to people with disabilities and veterans. Goodwill supports local programs to create job opportunities for people in the community.
- There is no home pickup service for people. Consumers have to come to drop off their donations.

Goodwill Customer (1)

- They don't like to spend a lot of money in brand stores. Instead, they prefer to get secondhand clothes.
- Her incentive for buying secondhand clothes is that it is cheap and recyclable.
- Places like Goodwill have everything in the warehouses.
- She's aware of Goodwill's recycling program and previously donated some of her clothes.
- She gets rid of her excess clothes by giving them to friends and consignment stores and only buying items when needed.
- She isn't aware of the recycling programs that a lot of big brands have in places like H&M and UNIQLO.

Goodwill Customer (2)

- She buys everything secondhand because it's sustainable and cheaper. She agrees that there's so much waste in the fashion industry, and it's really easy to avoid.
- She comes to Goodwill once a month.

- She isn't aware of the recycling programs brands have in place. Previously, she used a textile recycling program in Cambridge when she had old clothes that she could not donate.
- She doesn't trust the recycling programs because she hears stories of greenwashing and clothes going to landfills in developing countries.

Hypothesis Testing

User 1: female, Chinese, 30, analyst

- like delivery service, locate by maps, track what they turn out to be, get matched, rewards, find nearby users
- not sure about FAQ page
- dislike the news page because she said that she wouldn't read the boring news
- suggest combining find nearby users, news, and FAQ into a forum

User 2: male, Chinese, 28, architect

- like locate by maps, track what they turn out to be, get matched, rewards
- not sure about delivery service because he questions if the customer would like to pay for it or not
- dislike the news, find nearby users, and FAQ page

User 3: male, Chinese, 32, architect

- like delivery service, locate by maps, delivery service, get matched, rewards, and FAQ
- not sure about track what they turn out to be, find nearby users, and news because he questions the privacy aspect of this App
- hope FAQ will be about how to use rewards/coupons/ what can be exchanged/ where to use/ when the coupons will expire

User 4: male, British, 22, student

- like delivery service, locate by maps, delivery service, get matched, rewards, and FAQ
- not sure about find nearby users
- dislike track what they turn out to be and news
- Sees no point in knowing where the clothes are since they are delivered.

User 5: female, American, 50, dentist

- like locate by maps, tracking what they turn out to be, rewards, finding nearby users, news, and FAQ
- not sure about delivery service and getting matched
- Prefers to deliver items herself for assurance.

User 6: male, American, 18, student

- like locate by maps, track what they turn out to be, get matched, rewards, and news
- not sure about the FAQ, Delivery Service

- dislikes finding nearby users
- Can combine different users with feedback! So like an online forum with discussions.

User 7: female, American, 72, cook

- like delivery service, rewards, and news
- not sure about locating by maps, tracking what they turn out to be, getting matched
- dislikes finding nearby users and FAQ
- because he questions the privacy aspect of this App
- hope FAQ will be about how to use rewards/coupons/ what can be exchanged/ where to use/ when the coupons will expire

Affinity Diagram Link

Link: https://miro.com/app/board/uXjVOm_W03Y=/

Consumer Survey Link

Link: [Default Report.pdf](#)

Figma Workplace Link

Link:

https://www.figma.com/file/QfLGmMv0j7un8YL8z9AEcE/CS79_Project-3?node-id=0%3A1&t=GJvxKPRhPCik67UX-1

Figma Prototype Link

Link:

https://www.figma.com/proto/QfLGmMv0j7un8YL8z9AEcE/CS79_Project-3?page-id=0%3A1&node-id=242%3A5427&viewport=400%2C-3%2C0.11&scaling=scale-down&starting-point-node-id=242%3A5427

Final Presentation File

https://docs.google.com/presentation/d/1-IDnr9smjhN-GrV8dhyEO67EyHmKU6Mu_yay-wED6Jo/edit?usp=sharing