



Services for a sustainable lifestyle targeting Generation Z

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Abstract

This research proposes a service design named "Retrend" with the purpose of promoting sustainable lifestyles by assisting Generation Z users in discovering vintage clothing within their local communities. Through desk research and interview methods for data collection, interviews were conducted with subjects to clarify the daily life needs of Generation Z users. During the data analysis phase, this study generated three personas while examining the users' requirements. In the development stage, user journey maps and user flows were implemented and tested to identify timelines from both customer and buyer perspectives. Finally, prototypes were constructed and subjected to low-fidelity and high-fidelity testing to assess their feasibility. The findings drawn from this research indicate that Retrend effectively caters to users' motivation for purchasing eco-friendly clothes aligned with their ethical values. The Retrend service enables personalized experiences, enhances trust and transparency, guides sustainable consumption behavior, and provides an improved service experience. The practical implications lie in the fact that Retrend service can advocate for a healthy and environmentally-friendly lifestyle by providing people with various environmental knowledge and skills, monitoring real-time environmental conditions, offering social functions so that individuals can better understand the cause of environmental protection and actively participate in it, thereby jointly promoting environmental development.

Keywords: Generation Z, Retrend App, Service design, Sustainable lifestyle, Vintage clothing, Service design.
JEL Classification: M31.

1. Introduction

Since the development of modern design, it has experienced changes over three different value systems; from functional and commercial design to user-centered values (Von Hippel, 2005). In functional design, mass production was the core purpose of the value system. As for commercial design, the purpose of production was to pursue business values. The third period was when user-centered design became a required society value in which, the design should improve the development of the modern society. Service design and sustainable ideas are the core concepts embodied in targeted social value (Gulz et al., 2008; Hussain et al., 2008; Keinonen, 2010). Both the design and ideas are acquired design's social values, such the design is needed to promote social progress.

In the early 1970s, Victor Papanek pointed out that the value of modern design had fallen in serving industrial production and commercial interests had fallen., The designers needed to reshape values to suit the "real needs" of society. The ever-changing social environment required the emergence of a new design model, so service design was developed.

Service design appeared in the 1980s as a concept for management and marketing. In Shostack (1984) presented ideas on how to design "service" in the European Journal of Marketing. In Shostack (1984) proposed the concept of service blueprint in the article "Designing services that deliver". In the 1990s, service design began to enter the field of design. In 1991, the term service design first appeared in the book "Total Design" Service design focused on providing services when consumers do not own the products (services); instead they just use it. This significantly adapted this kind of sustainable design and consumption pattern.

This research utilized service design tools: empathy maps, personas, user journey maps, user flows to study the lifestyle of Generation Z. Empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviors and attitudes (Xia, 2021). Personas are an effective tool for outlining target users, discovering user appeals and designing directions. The creation of personas is based on a comprehensive examination of user behavior, motivations, emotions, consumption patterns, and needs, derived from accurate data analysis, making it a valuable tool for understanding user behavior (Cooper, Reimann, Cronin, & Noessel, 2014; Stickdorn, Hormess, Lawrence, & Schneider, 2018). User journey map is based on the timeline, combing the continuous behavior of the target user. It is used to visualize how the target user completes a specific task. User journey map visually shows or simulates the user's experience at each stage of completing the task, including emotions (pain points and surprise points), behaviors, thinking, etc (Stickdorn et al., 2018). User flow is the execution path of actions taken by users on web pages or applications to achieve a particular goal (Ranganathan & Mcfaddin, 2004). Users go through a tiny journey when

browsing web pages or applications. User flow emerged because designers needed to consistently achieve the best user experience when designing the interface of a website or application.

So far, existing research on Generation Z is mainly about their consumption behavior (Khalil, Ismail, & Ghalwash, 2021; Kovacs, 2021; Noor, 2017) most of the previous research in this area did not include the perspective of service design. Generation Z refers to individuals born from the mid-1990s to the early 2000s (Wood, 2013). This generation is seamlessly connected with the internet almost since the time they were born. Generation Z was greatly influenced by digital information technology and service, instant messaging equipment and smartphone products (Hoque, 2018).

Lifestyle reflects how a person spends his time, daily routine and life; it reflects that person's attitude, values and views of his world (Manap, Hamjah, Idris, Kasim, & Idrus, 2021; Sali & Wallter, 2023). There are various human lifestyles, as perfectionism, hedonism, and consumerism (Puaca, Theandersson, & Carlén, 2017). Generation Z has been practicing several lifestyles today; this research aims to promote a sustainable lifestyle to Generation Z. This introduces a case study named: Retrend, designed to explore the generation lifestyle.

To promote a sustainable lifestyle, Retrend was a sustainable service design system that allowed Generation Z users to discover and trade vintage second-hand clothing in their local community systems. Retrend was a school-enterprise cooperation project in Politecnico di Milano, it was developed for an Italian bank targeting Generation Z client. The Project targeted to encourage a balanced and healthy lifestyle for the user, motivate people to share resources, experiences and knowledge in order to support growth and contribute to a more sustainable society. There were other requirements, as preference of using AR(Augmented Reality)/VR(Virtual Reality)/Machine Learning technologies, as well as the delivery should be in the form of a mobile application.

The rest of this paper is organized as follows. Section 2 presents the proposed method. Section 3 conducts for data analysis. In Section 4, to develop the user journal map and user flow for testing the feasibility of prototype. Finally, Section 5 summarizes and highlights the practical contributions and limitations of this paper.

2. Methods

2.1. Desk Research

Desk research is also known as the secondary research, the term desk research is currently widely used (Rahman, Hamad, Alarifi, & Sedera, 2014; Woolley, 1992). Desk research is a tool for analysis and research of secondary data, it is fundamentally a user (researcher) skill. The focus of desk research is to collect, screen, organize and analyze secondary data according to research questions or research purposes. Secondary data include network materials, magazines, books, documents, etc. Desk research is a secondary survey based on previous research results (standing on the shoulders of giants). It can help investigators form a preliminary understanding of the research contents and avoid repeated research.

The desk research method helped researchers to study the lifestyle of Generation Z. Due to the radical change in the social environment in which Generation Z was born, their behavior and consumption habits are significantly different compared to the previous generations. The researchers summarized these differences from a report published by WRAP (WRAP is a climate action NGO), which is an NGO (Non-Governmental Organization) working to mitigate the climate crisis, have highlighted the potential for second-hand fashion to reduce resource usage, with an estimated 20-30% reduction in carbon, waste and water footprints, as well as a 20% reduction in resource costs. WRAP report is a pioneering report looking at the environmental impact of the whole journey of clothing; this report is directly related to this research. We summarized 3 aspects in this report based on the results of desk research as shown below:

The consumption aspect is particularly interesting:

Consumption re-defined: From possession to access: For Generation Z, consumption means having access to products or services, not necessarily owning.

Singularity: Consumption is an expression of personal identity: Generation Z embodies personal identity. Consumption thus becomes a means of self-expression. Generation Z expresses worldview and values through the way they consume.

Consumption anchored on ethics: 70% of respondents said they would prefer to buy from a company they believe to be ethical.

We generalized the results from the WRAP report that compared to the other generations, Generation Z has their consumption habits; they would use a product or service rather than care about ownership of the product. They convey their values through their consumption concepts. According to desk research, more than 1/3 of consumers are willing to pay 25% more for sustainable products. At the same time, Generation Z is more willing to pay extra 50-100% than other age groups' consumers. Therefore, this study proposes strategic design solutions based on Generation Z's consumption habits.

2.2. Interview

The results of the desk research conducted in this study indicated a trend towards sustainable lifestyles among Generation Z in their fashion consumption behaviors, specifically in the area of second-hand clothing. This led to the exploration of the potential for combining the vintage clothing and second-hand clothing markets as a focus for further investigation. To this end, a field research study was conducted, utilizing in-person interviews with eight Generation Z subjects in a vintage clothing store. These interviews were conducted with regular customers who frequently visit second-hand clothing stores. They were mainly young people, six of them are women. They all like to use mobile phones to shop. These interviews aimed to collect the considerations that influence Generation Z consumers to purchase vintage clothing. These interview subjects were the target user groups of this study. By studying their shopping behavior, we can provide ideas for subsequent design. The results of the interviews were synthesized and represented through empathy maps to gather information on the considerations and motivations that influence the purchasing decisions of Generation Z consumers when it comes to second-hand vintage clothes. The results of the interviews were then synthesized and represented through the use of empathy maps Figure 1 which are visual aids that capture knowledge about a user's behaviors and attitudes. Figure 1 serves as an example

of this representation, showcasing the details of what the subjects said, thought, did, and felt during the interviews.

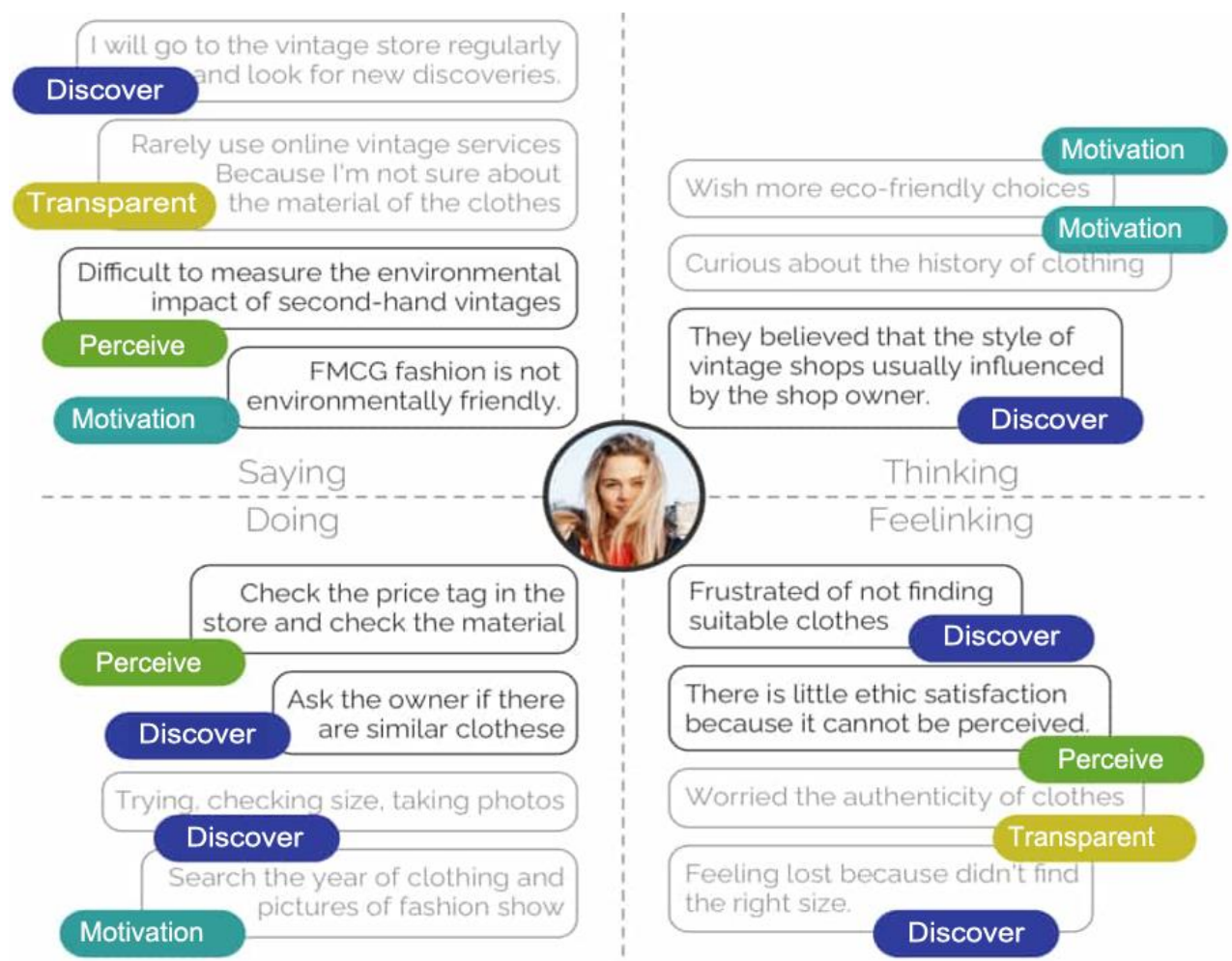


Figure 1. A empathy map.

The empathy map helped identify the users' requirements in this step; we obtained the motivations from the maps. For instance, one subject went to the second-hand vintage store regularly to look for new discoveries and she wished to find more eco-friendly clothes in the shop. However, she was disappointed and did not find suitable clothes. The experience of shopping for vintage products motivated the researchers to learn how to design a sustainable clothing selling system for Generation Z. First of all, to match the norm of Generation Z, a mobile application should be prepared to check the clothes before going to the shop.

The analysis of the interview revealed that Generation Z considers four main criteria when making a purchase at a second-hand clothing store: (1) motivation, which encompasses the satisfaction of their ethical needs and the environmental benefits of the purchase; (2) discovery, which refers to the alignment of the clothing style with their individual identity; (3) perception, which is concerned with the perceivable environmental impact of the purchase; and (4) transparency, which encompasses the ability to verify the authenticity of the clothing. These insights from affinity mapping form a crucial basis for informed design decisions in future stages. They offer an understanding of Generation Z's priorities in second-hand clothing purchases, which can inform the creation of design solutions that effectively meet their needs.

3. Data Analysis

3.1. Persona

Persona, as abstract representations of a collection of target users, effectively capture their attributes, and preferences. The methodology of using personas is grounded in user-centered design research and is widely recognized as an effective tool for outlining target users, discovering user appeals, and guiding design directions. The use of personas has a broad range of applications and is suitable for analyzing qualitative data, further emphasizing its relevance as a user-centered design research tool (Huynh, Madsen, McKagan, & Sayre, 2021).

The present research constructed three representative personas for the analysis of user data. The researchers synthesized qualitative data obtained through a combination of desk research and contextual interviews, which encompassed various elements such as consumption behaviors, motivations, and user descriptions including a fundamental user story and the technology preferences of the Generation Z demographic. To validate the accuracy and reliability of the personas, a brief examination was performed, leading to the implementation of necessary modifications and revisions.

Figure 2 is an example to show the target users; Guilia is a student with a background in fashion design who lives in Milian. She is a regular customer of the vintage second-hand cloth shop. She is buying those second-hand clothing not only for the low price, but also for the historical stories hidden behind the brand. As a Generation Z, she has the characteristics of this generation, and highly interactive in social networking. She also enjoys online shopping. In addition, she is a fierce environmentalist and insists on boycotting fast-moving consumer fashion goods. The researchers came up with the target user group Giulia in this step and will proceed with the following based on the needs of this group.



I care about the environment and like to be original in my fashion style.

ABOUT

Giulia is a student who lives in Milan. She has been study fashion for about 2 years from the school. She buys second-hand clothing not because it's cheap, but because of the history stories hidden behind the brand. She is highly receptive to social networking, online shopping. In addition, she is a staunch environmentalist and insists on boycotting fashionable fast-moving consumer goods.

COMSUPTION BEHAVIORS

- She purchases both online and in-store
- She likes to buy unique and stylish goods, especially clothes.
- She is well educated about brands and the realities behind them.
- She buys second-hand not for the price, but for the added value.



MOTIVATIONS

- Avoid wasting resources.
- Live a sustainable lifestyle to contribute to the society
- Like nostalgia stuff and also the history behind them.
- Redefine style and be unique.

Figure 2. A persona.

3.2. User Needs

Giulia’s persona represents the common characteristics, consumption habits, motivations, and needs of Generation Z. Personas helped to identify the user needs. A user need represents a vital requirement that has been identified as essential for an individual or a group of users to attain their objectives within a specified context of use. These user needs serve as an intermediary step in transforming context-specific information into comprehensive user requirements that can guide the design phase.

In this research based on qualitative data gain from observation and contextual interviews, the user goal was defined as empowering Generation Z to redefine their style by the incentive of sustainable reuse and exchange. To satisfy this goal and encourage the purchase of second-hand cloth, it’s essential to satisfy the considers four main criteria: motivation, discovery, perception, and transparency. These considerations will form the basis of the comprehensive user requirements that are necessary for the design phase.

The present research designed an eco-friendly clothes-selling service according to Generation Z's requirements. The designed service system would satisfy their ethical needs and help them find a way to verify the authenticity of clothes so that they would feel safe. The next step will offer a user journey map to show the details of the service.

4. Development

4.1. User Journey Map

This case study built the user journey maps for both the buyers' and customers' sides. The drawing of the user journey map is divided into several essential steps. It starts by analyzing the behavior and contacts of users at each step before integrating the whole process. Then the needs, expectations and wishes of users are deduced at the different stages of the process until the task is completed through a rhythmic user experience. The researchers analyzed users' pain points when making judgments and trade-offs for user needs. They prioritize avoiding the most crucial pain points instead over other user needs. In addition, the surprise points are explored during user behavior analysis of each stage.

This research used the following user journey map to visualize the future service state which is shown in Figure 3. In this map, researchers represented the concepts, from high-level stages down to each low-level step. In the left side of Figure 3 channels, touchpoints and precise needs are shown. The user journey map described the entire service

process chronologically in five dimensions: design requirements – seller needs – seller steps – buyer needs – buyer steps.

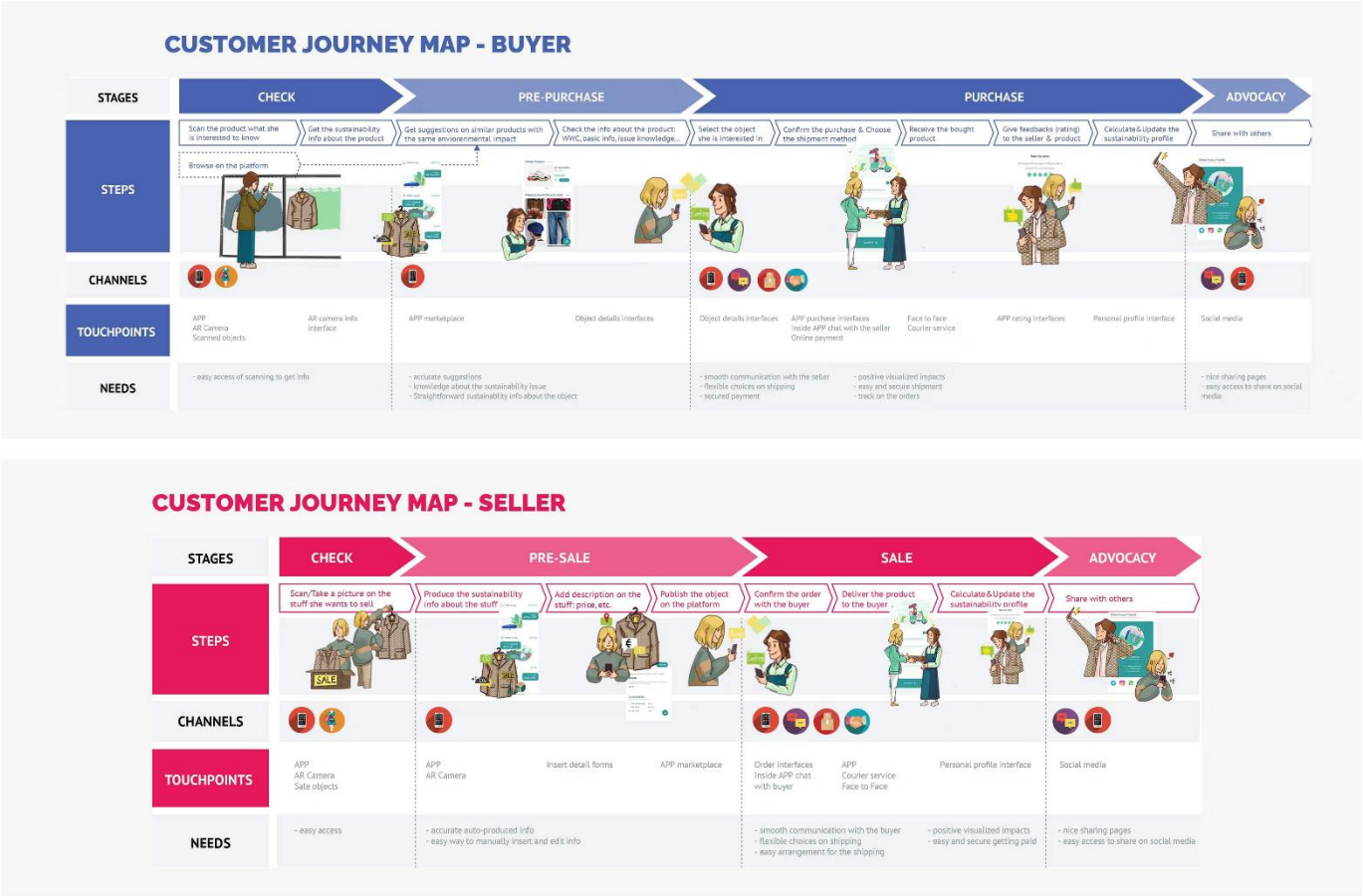


Figure 3. User journey map.

The generation of a sustainable impact, which quantifies the environmental impact generated after purchase behavior, is a crucial component in promoting sustainability and allowing users to assess the impact of their contribution. As a result of a comprehensive analysis of the service processes, it was determined that the solution's core lies in the sustainability index. To ensure the feasibility of the design phase, a brief desk research was conducted to examine the generation of this index.

The sustainable impact must be generated in a prompt, cost-effective, and precise manner, taking into consideration the varying environmental impacts of different cloth materials and manufacturing processes. After extensive research and evaluation, it was determined that machine learning is the optimal solution for calculating the sustainable impact. The DeepFashion dataset, comprising of 800K diverse fashion images with rich annotations, was found to be suitable for this use case and was utilized to develop the FashionNet machine learning model. This model learns clothing features by jointly predicting clothing attributes and landmarks, with a category and attribute prediction accuracy of 82.58% and 45.52%, respectively. As the DeepFashion dataset continues to expand, the accuracy of FashionNet's predictions will improve, enabling the identification of sustainable indicators for clothing brands and related information. With the implementation of a precise sustainable impact, the design can effectively meet the user's motivation and needs for Perception and Transparency.

The user journey map helped clarify users' pain points and needs. According to the project requirements, the next step is to design mobile applications based on the user journey map.

4.2. User Flow

After the journey map, user flow organizes the pages needed to design the prototype. In order to gain the best user experience, the design pattern of user flow is produced, which focuses on the tasks that users need to complete and the effective way to achieve these tasks. User flow is the foundation of website and application design; it can help designers focus on user needs and build processes and experiences to meet them. The design of user flow starts with understanding user goals and business goals. For example, in the user flow of online shopping, first of all clarify the user's purpose of buying a product, for instance replacing, returning or exchanging. Once the goals are defined, user flows can be created compared to business goals. The process is the steps for users after arriving at the website and complete tasks one by one.

Before starting to test the user flow designed, it's crucial to clarify the goal of the test. The goal was whether it meet the user needs, defined in Chapter 3.2 and divided into four insights: "Motivation; Discovery; Perception; Transparency." The researchers invited six subjects from Generation Z to test the user flow: four Italians and two Iranians. Three different tests were conducted at different times each targeting a different part of the user flow: Figure 4.

Test 1 targets the process of sustainable impact sharing, which is the most crucial feature of the solution in this service system. This test also verifies the solution of the pain points in users' needs named "Motivation" and "Perception".

Test 2 checks the process of the seller scan and object publishing. The test also verifies the of the pain points solution in users' needs named "Perception" and "Transparency".

Test 3, the process of buyer scan/browse process to buy an object is checked. It is also used to verify the problem solution in users' needs named "Discovery," "Perception," and "Transparency".

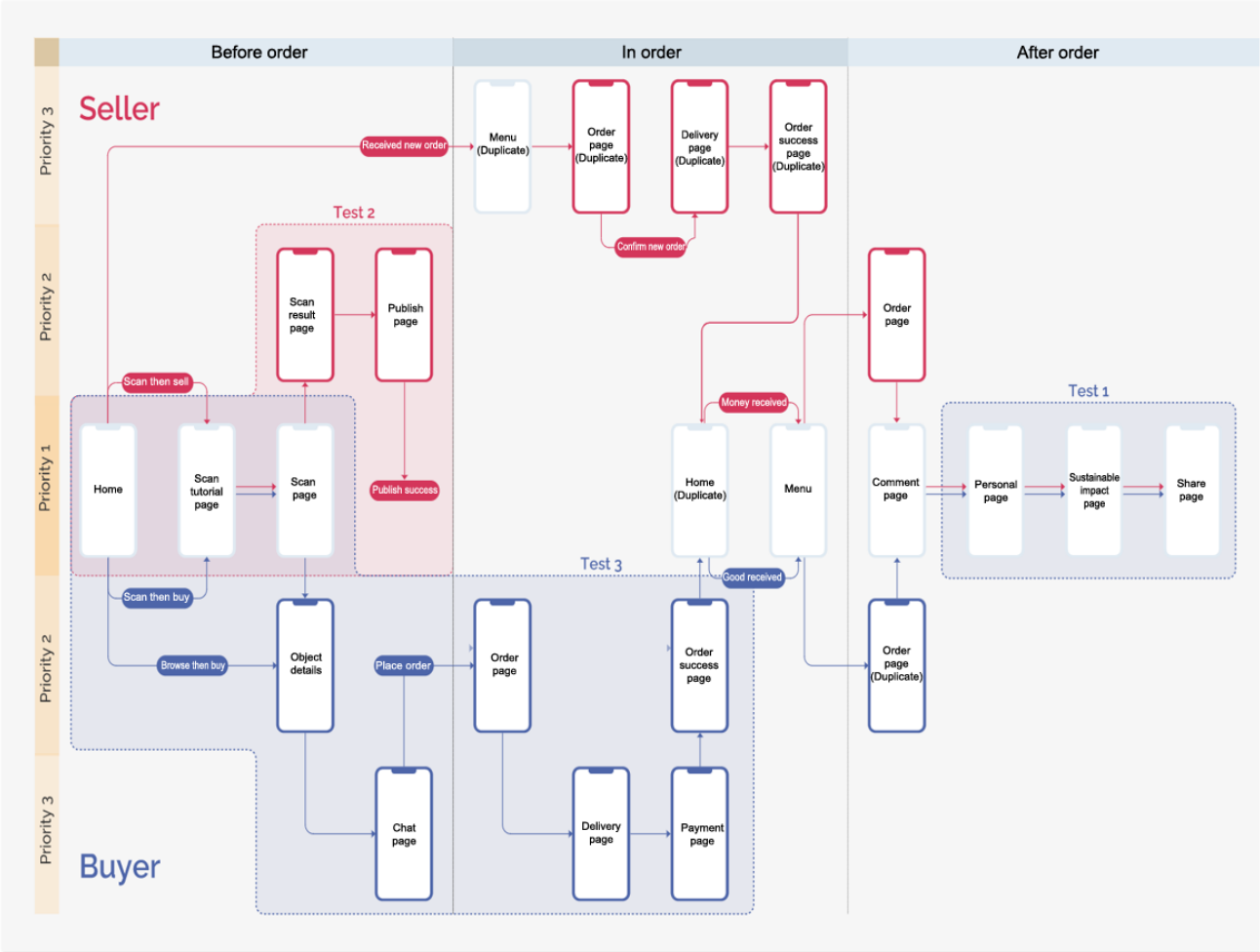


Figure 4. User flow.

The purpose of the three tests was to clarify the priority of the task. Test 1 had the highest priority. The priority of the Retrend service was to share sustainable indicators with users. The secondary priority comes from how the seller scans the code through the mobile client and publish products. Finally, what needs to be solved was the need to scan codes and browse the web to buy products when buying at home.

After identifying the priorities, the researchers started to design a low-fidelity mobile application prototype and test it according the above three tests.

4.3. Delivery

4.3.1. Low-Fidelity Prototype & Test

The researchers designed a low-fidelity prototype in this step to display the basic needs of the service, including core business logic, functional modules, etc. At this stage, there is no need to make all components, frameworks, layouts, etc.; the low-fidelity prototype is enough to convey to developers the requirements. In this step, we used low-fidelity prototypes for fast output and communication. We can also make revised products quickly because low-fidelity prototypes only need clear logic and functional design. The high-fidelity prototype requires extended production time and troublesome to modify.

The researchers used 'Adobe XD' software to design the low-fidelity prototype at a structural level and kept testing it during the design process. Figure 5 is a part of the wireframe, the same 6 six subjects were invited to test the low-fidelity prototype according to assigned tasks. After testing, the researchers got the feedback shown below:

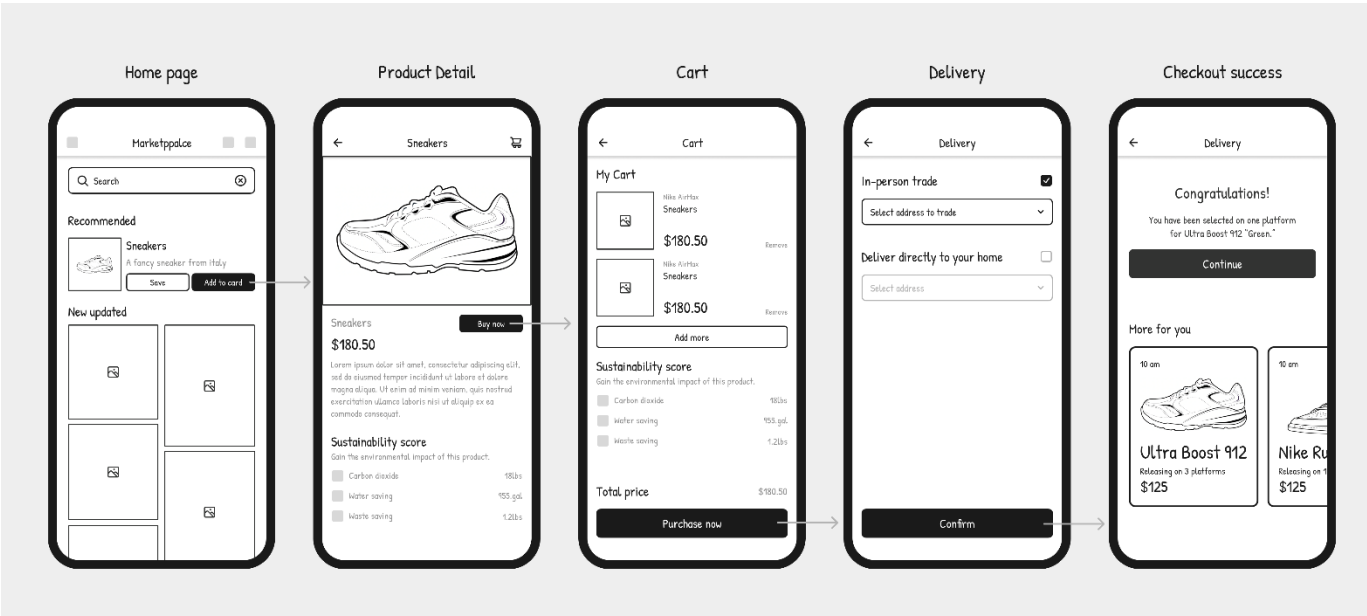


Figure 5. A part of the Wireframe.

1. The subject said they couldn't understand the meaning of sustainable impact. They found the impact was numbers and didn't understand the number's meaning.
2. One subject pointed out that he was uncertain about the fabric's composition's prediction accuracy. He hopes to know the accuracy of the scanned results and wishes that the page's layout is clearer.
3. The subject wanted to know why the service offered these recommendations.

After the test, product iterations carry out based on the test results, and the next task is to design a high-fidelity prototype.

4.3.2. High-Fidelity Prototype

A High-fidelity prototype contains the original ideas and clearly defines the product functions, logic levels, and interface. The ultimate expectation is to achieve the same state as the picture and the actual operation of the product. The high-fidelity prototype includes functions, processes, logic, fonts, colors, layouts, styles, visual effects, etc. Its main features are visual effects, interactive effects and experience effects. After testing the low-fidelity prototype, the researchers created a high-fidelity prototype by Adobe XD Figure 6. Here are some improvements according to the test results from the wireframe:

Make the sustainable impact easier to understand; the researchers used an analogy to explain it: buying a second-hand item saves the carbon equivalent of getting two cars off the road Figure 7.

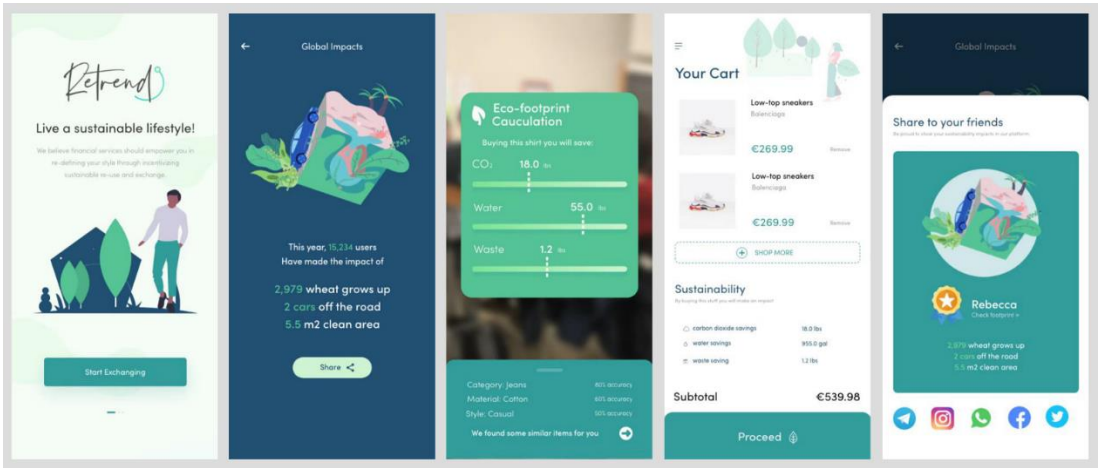


Figure 6. A high-fidelity prototype.



Figure 7. The details of a high-fidelity prototype.

Adding accuracy prediction and using AR to show scan results directly on the scanned object, which is more immersive and engaging.

Used labels to indicate why it was recommended. Users can click the labels and discover more similar items.

Figure 7 is to show the details of a high-fidelity prototype. Retrend suggests a sustainable lifestyle, an app of Retrend has the function to calculate the eco-footprint for the users and suggests an eco-friendlier lifestyle in their consumption behavior.

4.4. Feasibility and Findings

Retrend proposes a sustainable lifestyle to Generation Z; financial services offered by the bank should empower Generation Z in redefining their style through incentivizing sustainable reuse exchange. The researchers learned that Generation Z customers are willing to pay more for sustainable products, so this case study was conducted about vintage clothing purchase service system to test its feasibility on Generation Z.

The six subjects helped in testing the user flow and low-fidelity prototype. In the user flow test, subjects had problems understanding the meaning of sustainable impact. Thus, the designers used an analogy to make it clear by visualizing the metaphor in the user interface.

The sustainable impact comprehension is vital in this case study, which is directly related to the users' Motivation and Perception. The details of Test 1 are in chapter 4.3.1; three aspects contain: Personal page, Sustainable impact, and Sharing page. The other two steps were difficult to understand. Two subjects said this service efficiently helped them find eco-friendly clothes, and the sustainable impact page helped them perceive the environmental impact to satisfy their ethical needs.

Test 2 focused on the sellers' needs; the scan results page and publishing pages were tested to verify the accuracy of the fabric's composition's prediction accuracy. AR technology is used to scan objects and show results to the users directly, which will offer a more immersive and engaging sense.

Finally, Test 3 focused on targeting the buyers' needs in Discovery, Perception and Transparency. From the buyer's point of view, it is necessary to search for the desired item easily. It must also conform to the buyer's mental model in the subsequent purchase process so that the product can be used smoothly. Furthermore, the researchers added more information about the recommended products according to testing results to let the buyers know more about the products, such as sustainability index: carbon savings – water savings – waste savings.

Through 3 rounds of testing, it was discovered that this service can effectively help Generation Z users to find vintage clothing. The sustainable impact page contributes to raising awareness of environmental impact and meeting their ethical needs. AR technology can provide an immersive purchasing experience, and the implementation of this service can help users who enjoy buying second-hand goods quickly find their favorite clothing. By addressing the environmental impact factors resulting from online purchasing behavior, it achieves the construction of their

consumer behavior value system, advocates sustainable consumption concepts, and reduces environmental and resource waste.

5. Conclusion

Retrend is a service that allows users to discover and trade vintage clothing in local community systems, thereby promoting a sustainable lifestyle. By establishing the design system through Retrend services, it is possible to meet the consumption demands of Generation Z. Firstly, by designing services specifically for vintage clothing buyers, their needs for environmental friendliness and personalization can be satisfied. Secondly, providing convenience and personalized shopping experiences for consumers: service design can offer innovative ways to provide more convenient and personalized shopping experiences for vintage clothing buyers. This case study utilizes online and offline platforms to provide a wide range of vintage clothing choices, intelligent recommendation systems, and immersive experiences, helping consumers easily find clothing that suits them. Furthermore, trust and transparency are crucial for consumers purchasing vintage clothing. This case study enhances consumers' trust in vintage clothing by establishing reliable transaction platforms and providing detailed product descriptions and authentic product photos, among other methods.

This research actively guides consumers to consider sustainable factors when purchasing vintage clothing, promoting sustainable consumption behavior. For example, it provides information about the environmental and social impact of vintage clothing and encourages consumers to think about the consequences of their purchasing decisions.

In conclusion, vintage clothing purchases present opportunities and innovation for service design, which can be realized by meeting consumer needs, providing personalized experiences, enhancing trust and transparency, and guiding sustainable consumption behavior.

This research is still in the design stage. In the future, the Bank of Italy will need to continue to provide financial support and cooperate with existing second-hand clothing stores to develop the final product for this research.

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