# THE REPAIRHUB
DESIGN OF A REPAIR CENTER TO OVERCOME ROTTERDAM CITIZENS' BARRIERS TO REPAIR

## FLORIAN HENSCHEL
MASTERTHESIS STRATEGIC PRODUCT DESIGN
TU DELFT 2024

THE REPAIRHUB
*Design of a repair center to overcome Rotterdam citizens' barriers to repair*


Master thesis Strategic Product Design

*Author*
Florian Benedikt Henschel


*Supervisory Team*
Dr. Lise Magnier (TU Delft)
Dr. ir. Jotte de Koning (TU Delft)
Suzanne Dalman (Muncipality of Rotterdam)


Faculty of Industrial Design Engineering
Delft University of Technology
The Netherlands
03.04.2024


*Client*
Municipality of Rotterdam

Rotterdam Circulair

TUDelft

# Preface

Dear reader,

In front of you see the final deliverable of my Master's thesis, which marks the end of my studies in Strategic Product Design at TU Delft. It is the end of a project; I learned many things as a designer, consumer and Repairer in Rotterdam. This project was only possible with the many people involved. I want to thank my supervisory team, Lise Magnier and Jotte de Koning, for providing guidance and continued support and feedback. I want to thank Suzanne Dalman and the team of Rotterdam Circulair for making this project possible, facilitating it along the way, and providing support throughout. I am deeply grateful to the individuals who generously shared their time and insights during the interviews; your contributions were invaluable. Lastly, I am indebted to my personal support network, my friends, my family, and Luca, who stood by me during challenging times and made this journey possible.

I hope you can learn something new from reading this.

Florian Henschel

# Abstract

Consumer repair practices are detrimental to advancing the circular economy since they are a vital strategy for prolonging a product's lifetime and saving resources. Despite the need for repair services for a functioning circular economy, the practice of Repair for consumers has declined, and more and more citizens prefer product replacement instead of considering the Repair of consumer goods. Research suggests a general mismatch between consumer needs and repair service offerings. (Gobert et al., 2021). The Municipality of Rotterdam wants to facilitate circular behaviour for its citizens. The Municipality is opening a new recycling center with the adjacent Upcycle Mall. It is envisioned as a place for the citizens of Rotterdam to experience the aspects of a circular economy, including different circular economy practices, such as upcycling, recycling and reuse. Designing a Repair offering at the Upcycle Mall for small household electronics and textiles is the task set out to solve in this project.

The local provision of Repair is analysed and structured into four modes: self-repair, Professional Repair, Community Repair, and Non-Profit Repair. A special focus was put on the local community repair organisations (Repair Cafes) and the challenges they face.

A literature review and an interview study on consumer behaviour regarding Repair identify the main barriers consumers face. The special situation of the Upcycle Mall is analysed, and unique opportunities for interventions are identified.

Based on the research findings, a pivotal concept for the Upcycle Mall is proposed: The RepairHub. This repair center leverages its location to trigger repair actions. It introduces the Community Repair Concept, is a center for education, and links to and empowers the local Community Repair Organizations.

The design proposal consists of eight concepts structured in three groups. Three activities to conduct in the RepairHub were designed:
- RepairTogether: A convenient Repair Offer for visitors of the recycling center, to give their device another chance.
- Sort & Fix: A center to sort, fix and clean the electric devices brought to the recycling center, to make them ready for resale in local Secondhand Stores.
- RepairEducation: A concept to educate school classes on repair practices and include Rotterdams Repair Cafes in the Process

Complementing the RepairHub, a comprehensive signage system is designed to effectively guide people to the RepairHub and promote the local Repair Cafes. This system plays a crucial role in encouraging repair actions and making citizens aware of the local provision of Community Repair organisations. In addition, a website and flyer were created to promote these services further.

This thesis concludes with a set of final recommendations to the Municipality in an effort to support the Repair Culture and Provision in Rotterdam.

Keywords: Repair Service, Circular Economy, Rotterdam, Consumer Behavior, Repair Cafe

# Index

This Document was layouted to be viewed on a screen in Two-Page Spread View.

# 1. Project Introduction

In this section, an overview of the broader context and the scope of this project is presented.

## 1.1  Introduction

The Municipality of Rotterdam aims to become a circular city by 2030. As a part of this initiative, the lifespan of products in use by consumers needs to be prolonged and one way to achieve this is through repairing items when they are broken.  Although the practice of repair is widespread and has been a cultural practice for millennia, this practice has declined in recent years in the western world. According to a 2018 survey from the European Commission, only a share of 64% of EU-28 consumers repaired their products. The reasons for this are the throwaway society, products that are harder and cheaper to repair, and the decreased number of repair service providers in the last decades (European Commission, 2018). These barriers make buying a new product more often convenient, more exciting and sometimes cheaper for people. There are different fields of action for designers to overcome these barriers. First, by making products easier to repair in the design phase already, which makes repairs faster and cheaper. To help this, an agreement was rea

ched early 2024 within the European Union to define legislation for production companies of components for certain electric devices and mobile telephones, that their customers have a right to repair. This will put pressure on manufacturers for appropriate designs, where parts can be easily replaced by consumers or professionals. Second, designers can help by creating better repair services for consumers. By creating better repair services, repairs can be made more convenient for consumers and are a favorable alternative to replacement. Depending on the product to be repaired, people have in principle distinct options, such as repair shops, Self-Repair or Repair Cafés.
The Municipality of Rotterdam wants to promote the option of repair to its citizens and to find out what support the citizens need to choose repair instead of replacement. In this project, the focus is on repair services and how the Municipality of Rotterdam can optimize its offering for its citizens as consumers.

# 1.2  The Circular Economy

The circular economy is a proposed system of production and consumption that aims to minimize the impact of humans on the earth. It does that primarily through reducing the extraction of raw material from the planet and radically decreasing the output of waste that goes back into the environment. The reduction can be achieved through the proposed creation of material loops, in which the materials shall be reused or recycled for the longest time possible. When the material is not looping, it cascades down into the next loop outside, see pictured in Figure 1. The aim is to minimize the leakage of waste into the environment and keep the material, once it has been mined or resourced, used for as long as possible (Ellen MacArthur Foundation, 2013). Many companies, cities, and countries aim to transition to a circular economy within the next 10 to 15 years.

Based on the widely adopted butterfly diagram by the Ellen MacArthur Foundation (2013), the Dutch Environmental Assessment Agency created the R-Ladder Model (PBL, 2017) as shown in Figure 1, in which circular strategies are given a value according to their contribution to the circular economy. The higher up the ladder a strategy is, the more beneficial it is for the goals of the circular economy, meaning more of the value of the material is preserved, and fewer new natural resources are needed. The ladder reaches from R0, Refuse, as the most effective way to preserve material, to R9, Recover Energy, as the last option to avoid the inherent energy of the material not being used at all and going to landfill. Repair, positioned as Step 4 on the ladder, is thus an important strategy that prolongs the use of a product and is preferable to other strategies, such as refurbishing or recycling.
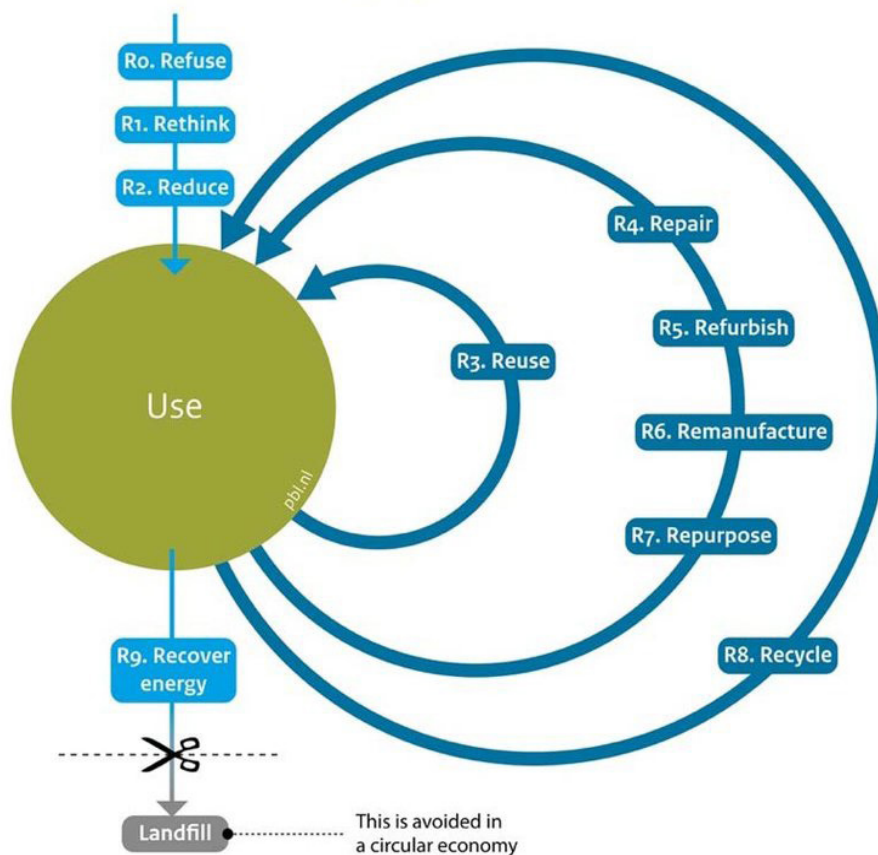


*Figure 1: R-Ladder Model (Potting et al., 2016)*

# 1.3 Electronics and Textiles in the Circular Economy

Although electronic and textile waste are only a tiny part of Rotterdam's overall waste production, these material streams are incredibly resource intensive, often challenging to recycle, and are valuable. Hence, these product streams, where consumers play a significant role, are interesting. To activate the potential of repair services for the circular economy and reach the goal of becoming a circular city, the Municipality of Rotterdam should facilitate repair behavior among its citizens. In this project the focus will be on the product categories of consumer electronics and textiles for repair services in Rotterdam, targeting its citizens as consumers.

### 1.3.1 Consumer Electronics

According to the Global E-Waste Monitor 2020, Waste of Electrical and Electronic Equipment (WEEE) (Forti et al., 2020) is the fastest growing global waste stream, projected to double between 2014 and 2030. In the Sustainable Development Goals (SDGs) set by the United Nations in 2015, reducing E-Waste and Textile waste relates to Goal3 (Health and Well-Being), Goal 6 (Clean Water and Sanitation), Goal 8 (Decent Work and Economic Growth), Goal 11 (Sustainable Cities and Communities), Goal 12 (Responsible Consumption and Production), and Goal 14 (Life below Water).
The main drivers of e-waste creation are higher consumption rates of electronics, shorter life cycles, and fewer repair options. Still, 62% percent of the Dutch population will not consider repairing an electronic product if the cost is below 100€ (SIRE, 2019). On the one hand, e-waste can potentially contain harmful materials that pollute the environment; on the other hand, it also contains valuable resources that are becoming scarce. 42.5 per cent of E-Waste is collected and recycled in Europe, and there are technical limitations to scaling up recycling.
While recycling methods are available to reclaim materials such as copper, aluminum and cobalt, they are often not cost effective. Additionally for some critical rare earth materials contained in these devices, such as tantalum, gallium there is close to zero recovery rate through recycling (Graedel et al, 2011). The virgin materials are often mined in developing countries with a large ecological burden and poor labor conditions. Additionally, being dependent on other countries for the supply of critical raw materials poses a large political and economic risk. This highlights the need for the creation of local circles and supply chain and the imperative to repair instead of recycling.

### 1.3.2 Textiles

The fields of clothing and electronics repair are vastly different and require different skills and processes, are conducted by differing craftspeople, and have their own drivers and barriers. Clothing repair commonly does not require specific spare parts; if so, these spare parts are standardized or can be adjusted to the breakage need, such as zippers or patches. In many cases, limited skills are necessary to make the piece functionally work again, although making the repair flawless and aesthetically pleasant will require more skills and time. The main reasons for clothing disposal are wear and tear, wrong fit, fashion, boredom, or running out of storage space (Laitala, 2014). The fashion of clothing and self-expression differs from electronic devices, which might only be matched with mobile phones. Different tools are also required, whereas textile repair is mostly done with a sewing machine, for the repair of electronics, besides hand tools also measuring equipment might be necessary.
Clothing production is also resource-intensive and can harm the environment, and recycling has similar limitations. The amount of textile waste is projected to grow in Europe from seven and a half million tons in 2020 to nine million tons in 2030 (Laitala, 2014). Even though many clothes and electronics are discarded without breakage, for example, because of being technically outdated or being seen as out of style, a repair can prolong a product's lifetime in many cases and, therefore, minimize the amount of waste created. Research found that 52% of the Dutch population will not fix their clothing at the same maximal price (SIRE, 2019). In the Sustainable Development Goals (SDGs) set by the United Nations in 2015, reducing E-Waste and Textile waste relates to Goal 3 (Health and Well-Being), Goal 6 (Clean Water and Sanitation), Goal 8 (Decent Work and Economic Growth), Goal 11 (Sustainable Cities and Communities), Goal 12 (Responsible Consumption and Production), and Goal 14 (Life below Water).

*Figure 2: Mountans of Waste Textiles and Electronics*

## 1.4 Rotterdam Circulair & Upcycle Mall

This project is executed for Rotterdam Circulair, a part of the Municipality of Rotterdam.
The governance and business support program Rotterdam Circulair aims to make circular approaches the standard throughout the city by 2030, to create a fully circular Rotterdam by 2050. It was initiated and operated by the Municipality and the Port Authority of Rotterdam. Several similar programs are set up in different cities throughout the Netherlands and on a nationwide government level. The transition is structured into several steps. The first program step is from 2019 to 2023, which coincides with the Municipality executive period.

The program focuses on four key sectors: construction, healthcare, bio-waste streams, and consumer goods. Here, potential for the transition in Rotterdam is seen. The Upcycle Mall focuses on consumer goods. In the 2019-2023 program agenda of Rotterdam Circular, special attention is paid to textiles and food waste, and for both roles, there is a responsible transition director in charge from the city side.
In 2024, the Municipality will close two recycling centers and will build a more significant one close to the airport in Overschie as a replacement. A rendering of the envisioned building is pictured in Figure 2. Part of this new recycling center will be the Upcycle Mall, a place for the citizens of Rotterdam to experience the aspects of a circular economy, including different circular economy practices, such as upcycling, recycling, reselling, and repairing. The Upcycle Mall will offer spaces for education, several spaces to use as workspaces for circular companies, entrepreneurs, designers, artists, and services to the citizens of Rotterdam. It is intended that the residents and citizens will have access to the materials arriving at the recycling center. The Municipality will rent out these various spaces to entrepreneurs and companies with circular ambitions to create a new circular business hub for the city.

The Upcycle Mall is being built with a new recycling center, where citizens of Rotterdam will deliver waste that is not disposed of through conventional curbside pickup. The efforts concerning the Upcycle Mall are to find external tenants to fulfill the vision of the Upcycle Mall in becoming a hub for circular entrepreneurship, design, and education. The spaces will be rented for a subsidized price, making them more attractive for businesses to settle here, but it is still necessary to charge rent. After Upcycle Mall is set up and running, little human resources should be necessary to continue running it. Besides the subsidies, the renters will not receive other funding directly through the upcycle mall. However, grants through other support schemes of the Municipality, such as CityLab 101 or the Circular Loket, are possible.
The Municipality is planning to employ three full time employees: One general manager, on manager for education manager, tasked to plan and conduct the educational activities at the Upcycle Mall and a community manager, connecting the different party at the Upcycle Mall and attract user as well as visitors. Additionally, workers are present to conduct the operations at the recycling center.
It is wanted to involve distinct types of renters, such as larger consumer goods companies e.g. HEMA or Decathlon and social enterprises e.g. Het Goed or Rataplan, educational institutions, and smaller companies, such as crafts people and designers. Besides them, there will also be a hospitality offering, e.g. a café, to offer visitors to the recycling center a place to rest and stay.

## 1.5 Assignment

The Assignment is to provide a solution on how the Upcycle Mall can best fulfill a role in promoting repair in Rotterdam and offer a repair service to the citizens.

For the development I will conduct research using a variety of methods, to uncover what the municipality can do to promote repair as an option to Rotterdam Citizens. I will research the barriers consumers face to repair their items both in terms of the local service provision and in terms of their own behavior. The special circumstances of the Upcycle Mall will be analyzed, and concrete opportunities will be detected to show how the Upcycle Mall can best fulfill a unique role as a repair service provision for Rotterdammers. To provide a scope for the research I will focus on the repair of consumer electronics and textiles. The expected outcomes of this project are distinct concepts for a repair offer at the Upcycle Mall, a campaign to increase awareness of the service and recommendations to the municipality promote the topic of repair throughout Rotterdam.

*Figure 3* *Rendering of the Upcycle Mall (Gemeente Rotterdam)*

# 2. Context

In this section, Rotterdam citizens' access to and barriers to repair will be analyzed. I have chosen to look at them through five different lenses to provide a comprehensive picture of the topic and deduct multifaceted context factor to inform my design proposal. The first lens "Repair Sector" (see 2.1.) will introduce and discuss the different options a consumer must repair both, as well as explain possible change happening to them. The second lens "Consumer Behavior" (see 2.2.) focuses on current consumer behavior concerning repairing with datapoints from a literature review. With a third lens, "Citizen Interviews" will provide in-depth insights from Rotterdam citizens regarding their experience with repairs based on interviews (see 2.3.). The fourth lens "Municipality and Upcycle Mall" will focus on Rotterdam Circulair, the municipal program behind the setup of the Upcycle Mall and provide an analysis of the aspects of the Upcycle Mall (see 2.4.).

# 2.1 The Repair Sector

This section will review the Repair Sector in detail. The upcoming changes in the EU legislature will be explained to show their possibility to change the current European Repair Landscape. The four different options for consumer repair, Self-Repair, Professional Repair, Community Repair and Non-Profit Repair, in Rotterdam will be introduced, and the barriers limiting their effectiveness as well as their drivers will be researched.  While the Data on Self-Repair and Professional stems from previous research conducted, the data for Community repair was collected through mixed methods including a literature review and field research. Information on Non-Profit Repair was collected with the means of two interviews.

# 2.1.1    Governance

The governance for a circular economy is developing with various new initiatives. Since this assignment focusses on repairs services, it is important to mention that in Europe and North America, lobby groups are putting pressure on governments to promote among others legislature that makes repair accessible and affordable to consumers. The Right to Repair Europe coalition, representing more than 130 organizations, proposed a new directive by the European Commission for an EU Right to Repair. In November 2023 the bid was adopted by the European Parliament into a negotiation position and received positive and negative feedback for the proposed actions (Right to Repair Europe, 2023). These actions include an obligation for EU member states to set up a national online platform to register repairers, refurbishers, and purchasers of defective goods for refurbishment (European Commission, 2022). Furthermore, professional repair providers should offer a standardized repair form for consumers to make comparing prices at different shops easier, thus enhancing the sector's competitiveness. Critics point out that the move undertaken is not far enough (Right to Repair Europe, 2023), while others warn of unexpected side effects, such as higher consumer prices (Jin et al., 2023). Still, this is a sign that the repair sector is changing.

In the future, this might be changed through upcoming eco-design guidelines by the EU and the better repairability of products. Although the Right to Repair campaign aims to facilitate DIY repair, this would also mean that the repair for professionals would get more straightforward and faster. Therefore, even household products would become viable again. To achieve that, cities can support the Right to Repair campaign, but also a sustainable, ongoing campaign amongst citizens to create more awareness to buy more accessible repair products. There are four major pieces of EU legislature in preparation that have the potential to change the governance of the current market of Repair Services:

"Eco-design" Directive: It includes a range of requirements for the design of products to be made more repairable but also longer lasting. The directive provides a framework for specific measures focused on product groups, which have been continuously added since the introduction in 2009.

"Empowering Consumers for the Green Transition" Directive: Mandates the trader and producer to inform the Consumer of the repairability, warranty, and accessibility of spare parts for each device.

"Green Claims" Directive: Requires the producer to adhere to rules when making claims about the sustainability of their product in marketing efforts, for example, by sticking to the lifecycle-based assessment of the environmental impact of their devices. The marketing claims are supposed to be easier to compare and less confusing for consumers.

"Right to Repair" Legislature:  With easier-to-repair products, shorter waiting times, and better access to spare parts, the probability that a repair is successful will rise, and it will be faster and thus cheaper to do so. This can make the professional repair services of household products viable again.

Most recently, at the beginning of February 2024, EU lawmakers concluded und der "Right to Repair" Legislature new repair rules for certain household components and mobile phones, which help independent repair and improve consumers' access to affordable repair options. The latter should be achieved by introducing rules for reasonable prices for original parts. The new rules will also ban software practices which prevent independent repair and/or the use of compatible and reused spare parts (Euractive, 2024). The European Commission claimed that its initial proposal would save some 18 million tons of $CO_2$ over 15 years and save consumers €176 billion in expenditures. Such legislation and others to follow would of course impact the following three repair categories.

# 2.1.2    Self-Repair

Self-Repair or Do-It-Yourself (DIY) repair describes repair actions conducted by the consumer. This can be the cheapest option to repair for the consumer as labor costs are avoided. Still, it can be time-consuming for the consumer to investigate and fix the broken object. The effectiveness of the repair heavily depends on a consumer's skills and knowledge of access to tools and equipment. Also, the design of a device can play a significant role. For example, some smartphone manufacturers glue in the battery, making a replacement complex and lengthy, while others make it easily swappable. Design for repair techniques can increase a consumer's ability to repair a device safely and increase the percentage of successful repairs (Huang et al., 2016). DIY repair is more common in clothing, with consumers performing simple tasks such as sewing on buttons or fixing a hole with mending or darning techniques (McLaren & MacLauchlan, 2015). DIY repairers can get support to repair online resources such as iFixit or YouTube, where guides and manuals for many products are provided. DIY repair is more common in clothing, with consumers performing simple tasks such as sewing on buttons or fixing a hole with mending or darning techniques (McLaren & MacLauchlan, 2015).

Since DIY mostly benefits from personal capabilities and motives and not on the local provision, there is little deviation expected between Self-Repair in Rotterdam and other western European cities. The shift to a service economy in the Netherlands and thereby the decline of craft education in the Netherlands might have a negative impact on individual craft skills.

As a conclusion, DIY repair on electronic components is cheaper in case tools are already available, but time consuming and its effectiveness overall volatile.

## 2.1.3 Professional Repair Sector

The professional repair sector includes a wide array of companies and stores. The one primary separation can be seen between manufacturer repair and independent service providers. Manufacturer repair covers repair activities by the manufacturer themselves, through a certified subcontractor or a certified retailer. A manufacturer warranty usually covers the cost of this repair (Manoochehri et al., 2022) or is conducted at a cost-covering price. By offering repairs, manufacturers or distributors are providing a service to their customers. Besides the goal of being compliant with warranty regulations, the company aims to provide a value-added service for their customers. By conducting repairs themselves, they are making the brand more attractive to consumers and having customers return to their store or other brand touchpoints. This is leading to a new purchase.

There are independent repair shops that complete repairs with or without certification or original parts. These shops usually focus on expensive equipment, such as phones, audio components or coffee machines. In textile repair, these jobs are often conducted by traditional craftspeople, such as shoemakers or tailors, who got formal training.

A study with repair professionals conducted by Möbius (2020) concludes that the repair market for small household electronics exists in the guarantee period, while creating a sustainable repair business model for out-of-warranty products is almost impossible. This is due to multiple factors, including high fixed costs because of training, wages, and cost for locations, low prices for new products, and limited availability of trained workers (Manoochehri et al., 2022).

Repairing small electronic household devices is mostly done if the item is within the manufacturer's warranty period. After this time, only some high-value objects like phones, watches, or, in some cases, coffee machines are usually repaired.

While the repair of products has become more difficult and costly, purchasing a new product has become much faster. If, for example, a coffee machine breaks down, the customer can decide if they should order a new one on the internet that arrives one to three days later, has a full warranty, and might even include new features. Or they can go through the process of repairing it, which can impose uncertain financial risks after the warranty period ends. Spending hours, first analyzing what is wrong, looking for spare parts, and still having a chance that the machine does not work after all the money and time invested. Additional cost effects are reverse logistics and the lack of economies of scale in comparison to the production of new items. Looking at the specific professional repair provision in Rotterdam, it becomes apparent that there is an abundance of repairers available for the repair of clothing and expensive electronics in Rotterdam's high streets and commercial centers. A search on Google revealed no results for independent repair providers that are taking on small household electronics, showing the difficulty of making a business case out of it.

## 2.1.4 Community Repair

Repair Café is a trademark of the Repair Café NGO; some publications use the term Community Repair Event or Community Repair Organization to describe these organizations. In the following text the words will be used interchangeably.

Community Repair bridges a gap between Self-Repair and professional services. Here, experienced volunteers support lay persons with the repair of their broken equipment. In most forms, they are gathering events where volunteers spend time repairing miscellaneous objects that visitors bring in. The restoration is sometimes done with a collaborative approach, where the repairer teaches the visitor the necessary skills to improve their things, share skills, and empower the consumer. The volunteer can also act just as a repairer without the objective of teaching. Community Repair events can happen in many circumstances, such as neighborhood initiatives, as part of local hacker or maker spaces, libraries, and community centers (Moalem & Mosgaard, 2021). The connection with recycling centers or second-hand shops is also standard in Europe (ShaRepair, 2021). Over time, more than 2000 Community Repair initiatives have been started worldwide. While these initiatives are usually open for everyone to join as a repairer if they have some proficiency, manufacturers and professional repairers call for better regulation of repair events, including repair certification (Möbius, 2020).

### 2.1.4.1 Community Repair Networks

Community Repair Events are now happening worldwide, mostly in developed countries, as grassroots initiatives to promote repair instead of throwing away. The events are organized locally by groups for their neighbors or people from the same city. Several organizations offer support and are building networks between local initiatives, for example, Netzwerk Reparaturinitiativen in Germany, the Restart Project in the UK, or the Netherlands as Stichting Repair Café. These network organizations support the group by sharing information and advice on repairing or setting up an initiative, like Stichting Repair Café, with a so-called starter pack that includes some tools and promotional material.

If an Initiative is a member of one of the networks, participants of Community Repair events are also covered by liability insurance. That covers the volunteers for any additional breakages during the repair.

The networks also act as the unified voice of Repair Cafés and the Right-to-Repair movement in front of the press or politics and can promote the goals more effectively. Together with industrial partners the networks mentioned form the Open Repair Alliance, to create an open standard for the repair of electronic devices. By collecting and publishing data on the types of repaired devices, the kind of breakage, and the rate

*Figure 4: A walk down one of Rotterdams Commercial Streets, revealed six businesses offering repairs for ICT equipment and 3 businesses offering repair for clothing. This is always done in combination with other services.*

of successful repairs for each breakage, the open repair alliance want to support the design of lasting products and put pressure on OEMs and Governments. Besides the raw data, Repair Café NGO is publishing a yearly report called the RepairMonitor, with a comprehensive analysis and observation of the changes throughout the years. The Open Repair Alliance also makes the data available to the public via a webtool, which simplifies looking for specific information on the repairability of items. The dataset suggests a success rate for repairs at Community Repair events at 55% in 2021, although this variates between product categories. For example, Lamps and vacuum cleaners show a high success rate at 70% and respectively 58%, in comparison to printers at 38% and flat screens at 31% (Open Repair Alliance, 2023)

### 2.1.4.2 Value of Community Repair

The values that Repair Cafés fulfil are reaching beyond the simple repair of items. Moalem & Mosgaard (2021) identified seven values they fulfill for the citizens, that are explained in the box below. These fulfilled values match the needs for the creation of a circular and social city.

#### Waste reduction and Product longevity:
Repair Cafés (RCs) offer communities a way to repair broken products, reducing their environmental footprint by extending the product's lifetime.

#### Strengthening Social Cohesion:
As a publicly accessible space, RCs offer a free-of-charge space and events to meet and interact, especially between the volunteers and visitors.

#### Pedagogical Aspects:
RCs can act as a starting point for deeper discussions and considerations of visitors about their ways of consumption and disposal. They can also be seen as a research platform on the connection between learning skills and long-term change.

#### Reskilling:
RCs act as events where forgotten and new skills can be learned and shared with a hands-on approach. This also gives the consumer more control over their used products.

#### Collaborative Aspects:
RCs are seldom spaces where visitors drop off their items and leave. It is expected that the visitor will collaborate and work together with the volunteers.

#### Service Aspects:
RCs act as a Self-Repair service where visitors can repair their broken items with the help of an expert. It also acts as a provider of parts and tools.

#### Change Agents:
RCs are a point where people can start thinking about their consumption but also start the interest of them in the circular economy.

The research by (Moalem & Mosgaard, 2021) shows that Repair Cafés provide an offer that impacts more than just the device that is repaired. Especially the pedagogical aspects, their commitment to reskilling, and their role as change agents, show their importance in promoting a culture of repair and the values of the circular economy.

According to a study conducted by Möbius (2020) professional repair providers see Repair Cafés not as competition for professionals but as complementary service since they fulfill jobs that are not of interest to professional businesses because of their insignificance or unattractiveness. Several publications warrant a collaboration of the Professional Craftsmen and Repair Cafés (Bizer et al., 2019; Lechner et al., 2021).

Repair Cafés are often used for out-of-warranty devices with no professional repair service, such as small household electronics (Repair Monitor, 2022), and less often for information and communication technology products. Thus, they are not a competition for professional repair services but an addition. Through education and awareness raising, they are even contributing to the likelihood of consumers using professional repair services (Fachbach et al., 2022; Graziano & Trogal, 2022).

### 2.1.4.3 Community Repair Provision in Rotterdam

To learn more about the Community Repair context specifically in Rotterdam, an overview of community repair organizations was created and structured both in form as a Map, as well as the form of a schedule. This facilitates the analysis of the provision of community repair in Rotterdam in the aspects of timing and location. The information and locations were gained through online research via the Repaircafe.org Website, the Van-zooi-Nar-Mooi Route planner by Rotterdam Circulair, Allekringloopwinkels.nl. Additionally, the websites and weekly programs of Rotterdam's neighborhood community centers were screened. The collection of information took place throughout April and May 2023.

The iterative process of collecting the data on Repair Cafés in Rotterdam was not only conducted to create a database, but also to experience problems a citizen would have to find a Community Repair Event in their neighborhood.

The research undertaken for this assignment found 17 locations of Community Repair in most areas of Rotterdam. During the search for Repair Cafés in Rotterdam many sources presented outdated information, especially on opening hours and location. It was also often unclear if the Repair Cafés were still operating. A complete list of the Community Repair organizations can be found in the Appendix (Appendix 3). Consecutively, seven Repair Cafés have been visited to test the repair of broken products (electronic components, textiles) and to experience the different atmospheres. These visits took place in April and May 2023. The researcher brought each time a different device piece of clothing to repair and tried to get advice on

*Figure 5: Map of the Community Repair Events found in this Research. The Organizations visited are marked in green.*

the repairability or conduct the repair there.
The insights from the desktop data collection and the visits are combined below.

## Provision of Information

Repair Cafés can be found through different channels, but the information on these channels needs to be updated. This can lead to confusion about the location or opening times when various sources display additional information. Only some have digital communication channels, such as websites or Facebook groups. Others are only noted, for example, in the community center programs, making them hard to find. The websites or Facebook groups are often updated sporadically. Only five Repair Cafés in Rotterdam are placed on the Stichting Repair Café Map, while additionally, four Repair Cafés are mapped but have stopped operations by now.

## Target Group

If Repair Cafés are only found by scanning a community center program, they are hard to find if people search for a repair solution. They are more likely to attract people in connection with the Huis van de Wijk or passersby.

## Opening Hours

A weekly schedule of Repair Cafés was compiled from the various sources of information (Figure 9). Only a few Repair Cafés open on a weekly basis. The Repair Cafés Hoek van Holland and De Esch open multiple times a week. Most Repair Cafés in Rotterdam happen once or twice a month. One Community Repair Organization (WERF Nordereeiland) found that it only opens on special occasions. The infrequent opening times in comparison with a shop can make the visit inconvenient and especially unhelpful for urgent repairs. Since at least one Repair Café is open per day in Rotterdam, consumers could be diverged to visit a Repair Café

outside of their own neighborhood.

### Location
Placing the Repair Cafés on a map (Figure 10) reveals that these neighborhood initiatives cover most areas of Rotterdam. However, some blank spaces exist, such as Het Lage Land or Feyenoord. In both cases, Repair Cafés existed here for some time and closed in the last years.
Repair Cafés can happen in distinct locations, but local community centers are the most common. One repair café reopened in May 2023 after being closed for two years, naming lack of location as a problem (Repair Café Noord).

### Volunteers
There was usually a group of 4 to 7 volunteers, with one of them sometimes acting as a host, welcoming new visitors, asking what was broken, and referring them to a volunteer with the necessary knowledge. The repair volunteers were all male except for the host. This was the opposite in a textile repair café I visited. Here the volunteers were all female.

### Volunteer behavior
In two places, a lot of attention was given to involve the visitor in the repair process by explaining the single steps and outcome of the diagnosis or guiding the visitor through the repair and use of tools. At the Textile Repair Café, help was only offered on request. On two visits the repair was completed without any explanation.

### Reliability & Continuity
Most Repair Cafés were founded in the early 2010s, with some already closed. In most cases, the exact reason for closing is unknown. One repair café reported closing because of a lack of funds (Repair Café Feyenoord). On two out of seven visits, I stood in front of closed doors, although the place was supposed to be open. This can be frustrating for consumers who plan to come by. The frequent closing of organizations because of distinct reasons makes them unreliable as a partner, although this differs between organizations.

The mapping exercise revealed the difficulty of finding reliable information on Community Repair organizations. Furthermore, the experience of the consumer differs vastly depending on the Repair Café visited. While some promote the education of consumers, others focus pragmatically on conducting repairs for the visitor. Based on the information supplied online and via the community center programs, the visitor cannot know before attending what to expect, which can be an inconvenience.
The different Repair Cafés often meet similar problems: a lack of volunteers, problems finding suitable rooms, effective communication of opening times across various channels, and funding. This corresponds to the existing Literature (Gobert & al., 2021; Bizer et al., 2019). As they are usually run as volunteer initiatives for the neighborhood, they need a unifying city-wide platform. Participants at one Repair Café

do not necessarily know about the proceedings at or sometimes even the existence of other Repair Cafés. As the volunteers take part in their free time, repairing is preferred compared to other secondary communication or bureaucratic activities. Thus, these activities can be neglected sometimes, decreasing the effectiveness of the Repair Café in terms of offering a place to repair for citizens. Therefore, the positive experience and/or preferences of the participants are put into the foreground, which might lead to the more active participation of these volunteers. Negligence of fun and the significant focus on organizational activities are typical ways grassroots organizations lose members and traction (Dobson, 2007). The inconsistent or rare opening time of every two weeks or even once a month expresses the limited time volunteers can distribute to these projects but may conflict with an immediate need for repair.
The Repair Café fulfills the value of repairing and creates connections in the neighborhood (mostly between volunteers and participants) and a place where the importance of repairable products is taught. There is also the question of whether volunteers of Repair Cafés even want more guests since this would limit the time spent on each repair and for making community building between the volunteers and volunteers and guests. Repair Cafés are created in various settings but are mostly connected to neighborhood help and rely on neighborhood networks. They are common as a bottom-up approach to increase repair culture in the neighborhoods. City support can have both positive and negative consequences, for example, increased expectations and a loss of authenticity. There is no connection that allows exchange of experiences and tools between the individual repair café facilitators. As grassroots initiatives, Repair Cafés often face similar problems, even though their initial set up can be quite different.

### 2.1.4.4 Interview Repair Cafe Volunteers:
An Interview with two Repair Cafe Volunteers were conducted to find out more about their motivation, their connection with the municipality and problems they face in their operations. Repair Cafe ‚Het Mooite Waard' is is organized by a group of people active in the Community Center Het Wijk Palais in Middeland After visiting the Repair Café in Het Wijk Palais, two co-initiators were interviewed, a young initiative that started in January 2023. The interview was conducted in their Office space behind the Wijkpalais.

Key Insights:
- There is a large fluctuation in visitors and volunteers. Sometimes, there are too many visitors to help everyone properly. Sometimes, just one person is coming, and therefore not enough to do.

- The Volunteersare driven by wanting to support their neighbors and teach Repair Skills. This can take a lot of time and requires a lot of patience from the repairer as well as the visitor. In some cases it would be more efficient for the repair to conduct it alone. This would therefore create a

tension with the purpose of the Repair Café as an educational place.

• Logging the type of repairs conducted for the Repair Monitor was seen as too much bureaucracy for the small initiative.

• They were not connected otherwise with other Repair Cafés in Rotterdam, but with other initiatives in the Wijkpalais. Although they are aware of one more Repair Cafe in their Neighborhood.

# 2.1.5 Non-Commercial Repair

Non-Commercial Repair describes service offerings between the Professional and Community repair sectors. Although they are in some cases conducted by Repair Cafés, they do not fit into the section of Community Repair, since the Repair Service is provided without a collaborative or educative aspect. An example found in the Rotterdam area is the Repair Café Barendrecht which collaborates with the hardware store Karwei under the name Repair Studio. A Repair Café event occurs every two weeks at the Karwei location in Barendrecht. Furthermore, Karwei customers can drop off their broken goods throughout the week at the locations in Barendrecht and Hoogvliet and have them repaired for free by the volunteers of the Repair Café. Customers only need to pay for the use of spare parts. Repair services are also sometimes offered by social enterprises, where people with a particular need or that are otherwise hard to employ repair products, sometimes for free or for a small charge. Third-sector companies are creating job opportunities for people with disadvantages in the labor market, such as handicapped people and people with a long-term unemployment period This system aims to enhance social inclusion, provide skill development, contribute to community well-being, and, if possible, re-integrate the individual into the conventional labor market by education and developing marketable skills and providing structure and an important social purpose. In the Netherlands, the government provides subsidies to these third sector organizations to cover a sizable portion of the wages and associated costs for these employees. This enables the organizations to offer employment opportunities that might not otherwise be financially feasible. Several WISE are active in Rotterdam in the Reuse Sector, e.g. Het Goed, Rataplan and Opnieuw & Co. They are known to the public through their Secondhand Stores.

## 2.1.5.1 Interview Repairer Volunteer at Non-Commercial Repair Service

Repair Café De Esch is organized by the social enterprise that also operates the neighborhood community center. Repair Café De Esch is the only Repair Café that does not focus on Community Repair but offers free repairs conducted by the volunteers themselves. They are open three days a week, and neighborhood citizens can drop off their broken electronics during the opening times. The objects are then repaired within one to three weeks, depending on whether replacement parts are necessary and available. The neighbors only pay for the cost of the replacement parts. The four repairpersons are all people with a technical education and work experience in a trade that ended through sickness or injury. The location is a small room on the top floor of a neighborhood center managed by a social enterprise. The place manager produced the idea for the Repair Café here to apply their skills. They only offer the repair of electronics. The interview was conducted with one of their volunteers in the Repair Café. The interviewee pointed out the following:

• The volunteers are happy to do the repairs; it gives them a feeling of pride, and they like to be helpful to the people in the neighborhood with their skills.

• With the repairs, they hope to help the citizens to save money.

• They want visitors to refrain from joining them or helping them with the repairs but do it themselves. They do not want to educate people to repair the devices but are happy to explain things.

• The volunteers were exceptionally proud of the high percentage of electronics they could repair, they logged the information via the Repair Monitor program.

• They repair the items free of charge, and only require the client to pay for the replacement parts if necessary. In some cases, their volunteering is necessary to receive unemployment benefits.

• Since this Repair Café has its own space, devices are stored until necessary replacement parts arrive and there is time for the repair.

## 2.1.5.2 Interview WISE Manager

For this research, a general manager of a large secondhand store operated by a WISE in Rotterdam Zuid has been interviewed. The goal was to gain knowledge on their involvement in Repair Services, their values the business, the resale process and the re-employment scheme in the Netherlands. Het Goed is a social enterprise in the Netherlands focusing on providing working opportunities for people at a distance from the labor market and reusing textile and consumer goods in their second-hand stores. The person interviewed is the manager of one of their 30 stores open to the public. The company is a social enterprise, not focused on maximizing profits, but aiming to offer jobs to people with a labor market disadvantage and offering clothing, furniture, and consumer goods to people with limited financial resources. The semi-structured interview was conducted remotely via a

phone call in July 2023. The interview lasted one hour. Besides questions on their involvement in repair, one guiding question was aimed at asking for the potential they see for a repair provision at the Upcycle Mall. The interview guide will be added in the appendix.

Key insights achieved:

- The store has some fully paid employees, but most of the essential work is done by people paid through social work schemes, so people are at a disadvantage in the regular labor market. A lot of attention is spent on fulfilling the requirements of these practices and offering an individual work plan to them. These employees are given tasks fitting their abilities and are sometimes reintegrated into the regular labor market. Most of the work they do is unskilled work.

- The company receives vast amounts of textiles. They must sort a lot of clothing to find pieces fit for resale in the Netherlands. Not all the clothes they receive are sold later in one of their stores. Broken Clothes are sorted out immediately and repairing them would be very time-consuming. There is an overflow of textiles in good condition available anyway.

- The company works together with the municipality to train people to refurbish bicycles. The bicycles are then resold at their stores.

- They do not conduct repair activities on electronic articles besides basic functionality checks for electronics. If the device is broken, that is noticed at the buyer's house. In these cases, they are accommodating and either exchange the product or pay back the price paid.

- The store manager would like to offer upcycling workshops with the objects they receive or have a Repair Café to bring people to the store. Unfortunately, it cannot be done yet since this requires specific skills none of the employees have.

- Because of the proximity to the recycling center, the store manager imagines it could be a good place for separating and fixing electronics that the company can later sell through the network of stores.

The biggest barrier the store manager sees in conducting repair activities in their store is finding skilled and motivated employees. They both need to be able and willing to conduct these tasks. Some people who work there might have had these skills once but have lost them during a long time of unemployment.

## 2.1.6 Conclusion Repair Sector

The goal of this section was to give an overview of the different parts of the repair sector and provide a picture of its problems in general as well as locally in Rotterdam. By discussing the upcoming changes in the governance of repair, I provided a perspective of the current barriers of the sector in general and how this might change soon.

The four types of Repair Provisions, namely Self-Repair, Professional Repair and Community Repair and Non-profit repair fulfill distinct roles in the local repair economy as displayed in Figure 5. For people with enough time, skills and confidence DIY repair can be the most convenient option. For more difficult repairs, professionals are tasked by consumers, because of the need for expert knowledge. Community Repair is combining is attractive to consumers, since it is free, but relies on consumer participation. Additionally, Non-profit Repair does not need a consumer's participation but an invested NGO and the right repair experts. They also might have different goals, but they do not need to see each other as competitors as the support of one sector does promote the other sectors as well.

Repair Services are most often used for costly devices, such as phones or where repairs are comparatively standardized as with clothing. For most

Overall, the lack of repair provisions makes repairing more inconvenient, leading to a lower repair demand. The lower demand for repair decreases the need for producers to make easy-to-repair devices, making the repair more complex and thus less viable, leading to fewer professional repairers. It is a spiral downwards. Community Repair is the solution to overcome the viability barriers of professional repair for small household electronics and the lack of knowledge and tools that is needed for the Self-Repair.

Following conclusions can be made:

**Professional Repair:**
- There are plenty of businesses that offer repairs of valuable electronics such as Smartphones and Computers in Rotterdam neighborhoods, often as part of other business activities, such as the sale of smartphone accessories, showing that repair itself is not viable as a standalone.

- Currently for out-of-warranty repair of small household devices there is no professional option in Rotterdam.

- For the repair of textiles there are services available in Rotterdam neighborhoods and on commercial streets. A repair provision for textiles at the Upcycle Mall would need to provide a unique value to the consumer to justify the inconvenience of travelling there.

**Self-Repair:**
- Self-Repair is convenient because people can do it on their own terms, in their own free time. But it requires skills, knowledge and tools only a few people have or have the time and money to acquire. The Community Repair organizations fill that gap and take place in the neighborhoods, making it convenient for citizens to come by.

**Community Repair:**
- Community Repair is a free offering to repair, together with volunteers, for people who need the skills or tools to repair their broken devices. It is most often used for out-of-warranty repair.

- Repair Cafés fulfill a variety of values, besides the simple repair of an object, for example education, providing a community, and awareness raising. These values show their unique potential to support the circular economy from as a grassroot movement. Merely focusing on one value, for example repair as efficiently as possible would dismantle the social purpose and might lead to volunteers stopping their commitment.

- Repair Cafés can find support on a national and international level such as the Stichting Repair Café and, through collaboration with each other, achieve bigger common goals, such as lobbying politicians to change the regulations for companies. Current development in European governance legislation that such lobbying at different political levels will pay off.

**Barriers of Community Repair Organizations in Rotterdam**
- There is no unified voice or major institution advocating Community Repair in Rotterdam, but many single actors and initiatives in different areas. This makes support them a difficult partner for the Municipality in action to promote repair in Rotterdam. It also decreases their effectiveness in spreading a repair culture in Rotterdam.

- Although Community Repair Organizations face similar problems, their structured support by the municipality is seen as difficult. First because of the inconsistency inherent with small volunteer organizations, secondly because of their different operational structures and third because of a fear of losing authenticity as a grassroots organization if the support is overarching.

- Although Rotterdam has in comparison to other cities no single large Community Repair institution, the substantial number of Repair Cafés is remarkable. Through their placement in the neighborhoods, they act very locally. Furthermore, the diversity in organizational structures, ways of working and identity is significant, and the visitor should be made aware before their visit.

- They lack the ability to communicate outside of their neighborhood network to attract new groups of consumers.

- The unreliable communication and difficulty finding combined information on different Repair Cafés can frustrate consumers motivated to repair.

- Because of their rare opening times, Community Repair Organizations are not reliable for urgent repairs. Because of abundance of Repair Cafés there is a possibility for Community Repair every day of the week

**WISE and Non-Profit Repair**
- Social Enterprises are interested in offering repair activities but have trouble finding the right people.

- For people in Social Work contract, they want offer possibilities to develop and are warry of them being used as a cheap workforce.

- The Reuse Companies lack the possibility to test, clean and repair the electronic items they sell.

- The repair of clothing is for them not an option, first because of the lack of skilled workers, second because of the overflow of secondhand clothing available.

# 2.2 Consumer Behavior

The reasons why citizens do not repair their belongings and the motivating factors are researched with many surveys conducted in different settings and contexts (Fachbach et al., 2022) (Svensson-Hoglund et al., 2021) (Nazlı, 2021) (Scott & Weaver, 2014). This chapter gives an overview of consumers' current behavior regarding repairs and the factors impacting repair behavior as found in the literature.

## 2.2.1    Current Behavior

According to a special Eurobarometer survey by Kantar Belgium (2020), only 31% of consumers did repair a product instead of replacing it in the six months before the study was conducted. The survey also states significant differences between distinct categories of consumers, stating that repair behavior is especially likely among men, people between 25 and 54, people with academic education, and people with stronger political interest. Rogers et al., (2021) on the other hand reported no significant gender differences in overall repair propensity, although showed that men are more likely to conduct Self-Repair. Furthermore, Magnier and Mugge (2022) found that 60% of Western European consumers did not consider a repair before the replacement of an item, and that only 40% of those that had considered repairing had their item successfully repaired. Consumers are more inclined to repair, when the product is fully malfunctional, compared to a partly malfunctional product.Mclaren and Mclauchlan (2015) found that in the case of clothes because of the rise of fast fashion, professional repair is no longer a necessity since replacement is cheaper than the cost of repair.

## 2.2.2    Factors Influencing Repair Propensity

An extensive explanation of factors influencing a consumer propensity to repair is provided by the framework of Lefebvre et al. (2018), that is shown on Figure 6. The author says that four elements impact the intention of a repair.

Market Factors:
Market factors to influence consumer propensity are the individual factors of the local market that the consumer is acting in. This is, for example, the existence of repair services, the availability of parts for replacement and/or the trustworthiness of the companies.

Product & Service Factors:
Product and service factors impact how high consumers value an item or how it is devalued after it is broken, for example, through the original sales price or customer support.

Consumer Traits:
There are several characteristics and values a consumer can have that will impact their willingness to repair. These predispositions include for example thrift, as well as environmental concerns.

Consumer Capital:
Another influence for consumer propensity is the consumer's access to support, advice, information, and financial resources.

The repair propensity is not the only necessity for a successful repair, which is needed to prolong the lifespan of the device. Buying easy to repair items and performing acts of product care, such as descaling a coffee machine make it more likely that the repair can be done conducted with ease.
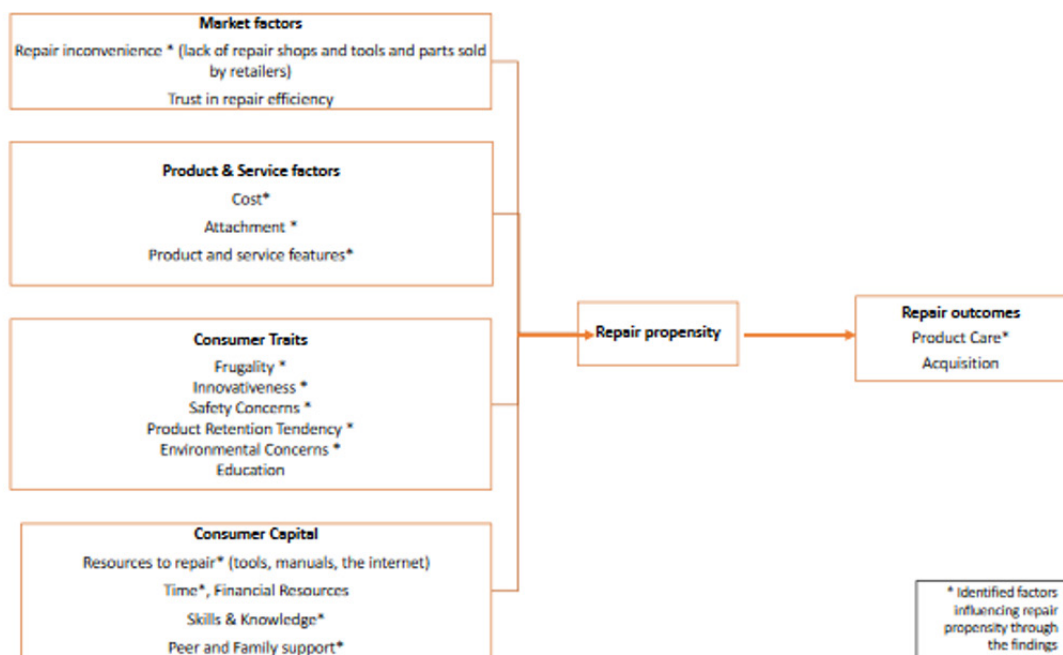


*Figure 6:* *Repair Propensity Framework of Lefebvre et al. (2018)*

## 2.2.3    Barriers impacting repair propensity

To dive deeper into the factors and especially barriers impacting repair propensity, prior research on barriers to repair was consulted. To structure the barriers the following seven categories were created.

*Product Obsolescence:*
Due to faster technological cycles new features for products such as smartphones are introduced frequently, lowering the perceived attraction to the product that the feature does not have. The desire for new features plays a role in product replacement for technical equipment (e.g., TVs or Smartphones), for utilitarian products (e.g., washing machines) this effect is lower (Magnier & Mugge, 2022).

*Lack of Knowledge and Ability:*
Especially in Self-Repair, knowledge and skills play a significant role in the decision to repair (Jaeger-Erben et al., 2021; Korsunova et al., 2023; Mclaren & Mclauchlan, 2015; Nazlı, 2021).

*Economic Costs:*
Cost plays a crucial role in decision-making. Consumers consider the cost of repair compared to the value of the product. They may opt for a new purchase if the repair cost exceeds the value or potential replacement cost. Unreasonable prices of repairs in comparison to low prices of new products are seen as the main barrier to repair (Jaeger-Erben et al., 2021). Still, Brusselaers et al. (2020) report that for electronic household products, repair is cheaper for consumers in the long term.
Fachbach et al. (2022) state that consumers in the EU are willing to pay between 19 and 30% of the purchase price for a repair on the product.

*Behavioral Costs:*
Jaeger-Erben et al. (2021) describe time as another main factor impacting repair decisions. Repairing a product is usually more time-intensive than a replacement, whether it is done by Self-Repair, Community Repair or professional repair, if you compare it to same-day delivery options available from some electronic retailers. Many people today have little extra time available, especially if they, for example, care for children or pursue full time jobs. Consumer repair has also been described as potentially frustrating because of a lack of information available on the device to repair (Scott & Weaver, 2014). The same author also describes uncertainty about the availability of replacement parts, the cost of labor and the overall success of the repair as an emotional cost in consumer repair.

*Social acceptance:*
Repaired products are commonly seen as inferior to new ones and attributed to a lower value (Rogers et al., 2021), especially with clothing. Repaired clothing has been associated with poverty (Mclaren & Mclauchlan, 2015), which makes it less desirable for consumers wary of this as a stigma.

*Previous experience:*
Although the outside conditions stay the same, multiple sources state that positive experiences with repair increase repair propensity in the future (Nazlı, 2021; Godfreyet al., 2022). A positive repair outcome, meaning that the item is fixed afterwards, is not necessarily necessary (Korsunova et al., 2023). 70% of citizens that use a repair service had their expectations met or exceeded. (European Commission, 2018b)

*Environmental concerns:*
Fachbach et al. (2022b) report environmental concerns as the strongest driver of repair behavior. However, even consumers with a solid ecological consciousness show an intention-behavior gap in repairing meaning that the set intention is not translated into a person's actual behavior.
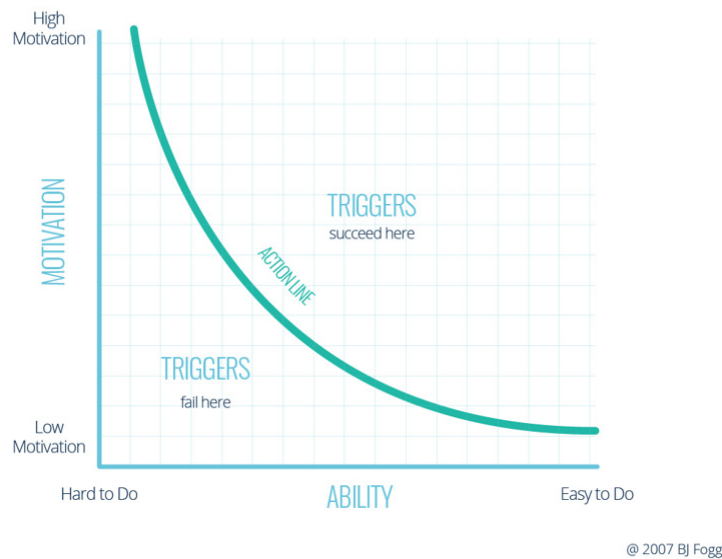
High
Motivation

MOTIVATION

TRIGGERS
succeed here

ACTION LINE

TRIGGERS
fail here

Low
Motivation

Hard to Do        ABILITY        Easy to Do

@ 2007 BJ Fogg

*Figure 7:  Foggs Behaviour Model (from: https://www.growthengineering.co.uk/bj-foggs-behavior-model/)*

# 2.2.4    Fogg Behavior Model

One explanation of the gap between intention and action can be made through the Fogg Behavior Model, shown in Figure 6. The Fogg Behavior Model (Fogg, 2009) is a framework that explains behavior change by considering three elements: Motivation, Ability and Trigger as well as their interaction.

1.      Motivation:
This element refers to the individual's willingness to engage in a behavior. In consumer repair this can for example stem from the perceived value of the item that needs to be repaired, cost savings or environmental concerns. For instance, if an item has a high value for the owner and the owner is motivated to reduce waste, they are more likely to attempt repair.

2.      Ability:
The element of ability refers to an individual capability to perform the behavior that is desired. In terms of consumer repair, this can relate to personal skills and knowledge required for the repair process, but also the accessibility and ease of use to capable repair services. Also, time can be considered as an ability factor.

3.      Triggers:
Triggers are prompts that initiate a behavior. They can be divided into three categories: motivation-driven (when motivation is high), ability-driven (when ability is sufficient, and trigger driven (re

lating to external cues). In consumer repair, a trigger could be a broken item (trigger-driven) or attending a repair workshop (motivation-driven).

The Action Line in Figure 7 separates the space where triggers succeed in spurring an action from where triggers will fail. So, motivation and ability must be sufficient for the trigger to spark a move. As discussed, abilities and motivation differ among consumers. To exemplify how this impacts the repair behavior, someone with a high motivation to repair, such as environmental concerns, might not fix an item after all if it is too difficult or inconvenient to do under the consumer's circumstances. Additionally, a trigger is needed to spur an action, which might be missing in the consumers' daily life. Interventions must focus on aligning motivation, ability, and triggers to promote consumer repair. In the case of this thesis this warrants the question, how the Upcycle Mall can have an influence on these factors, to spur repair actions.

## 2.2.5    Conclusion Consumer Behavior

In this section a literature review was conducted to understand the current behavior of citizens regarding the repair of items. Factors that impact repair propensity were introduced and seven barriers' consumers are facing were identified via a literature review. Additionally, the Fogg Behavior Model was introduced, to gain an understanding of these barriers can be overcome.

From this section the following conclusions can be conducted:

• More than half of Consumers are currently not even considering the repair of items and are choosing to replace the item, if it breaks.

• A variety of factors influence the consumers' propensity to repair an item. Main barriers are the lack of time, inconvenience and the expected high prices for a repair.

• The barriers are different depending on the specific background of the consumer. This means that a one-fits all solution for a repair service at the Upcycle Mall is impossible to design. Different opportunities to repair should be given to the consumer. This way the consumer can choose the service depending on their own circumstances.

• The Upcycle Mall could provide different offers to impact both, the Abitliy to repair, but also the individual's motivation, to increase repair propensity eventually.

# 2.3 Citizen's insights from seven Interviews

The literature review on consumer behavior conducted in section 2.3. needs to be supplemented with the views of citizens of Rotterdam. By conducting interviews about individual repair experiences, the research is augmented with personal feelings that pose a barrier to repair for the interviewees.

# 2.3.1 Method & Participants

Seven semi-structured interviews with citizens took place in three weeks in May 2023 to examine the findings from the literature review, test them in the Rotterdam context, and gain richer data on the citizen's behavior.

Svensson-Hoglund et al. (2022) divide the repair process into eight sections (Figure8), which were used as a framework to create an interview guide (Appendix 3) with questions about experiences with single steps of the process. The interviewees were questioned in this semi-structured approach to recall their repair experience in Rotterdam on one or multiple items focused on electrical equipment and textiles (see also 1.5 Assignment). Most participants could recall different experiences memories of them. The interview guide can be found in the appendix. The eight repair steps were also used as a framework for analyzing interviewees' experiences. I added quotes to the findings to illustrate the thoughts of the user.

The open questions aimed to provide insights from their individual experiences in repairing their objects, without separation of professional, DIY or Community Repair. Since citizens' intended behavior can differ from how citizens people behave, they were asked about experiences that happened in the past, and not how they would react in a potential scenario. Still, this analysis relies on their depiction of their behavior, which can lead to answers influenced by a so called social-desirability bias, as described by Paulhus (1984). Besides their experiences with Professional Repair, DIY and Community Repair of electronics and clothing, participants were also asked about their knowledge about and attitude towards Repair Cafés.

All interviewees have lived in Rotterdam for more than a year. The people interviewed were mostly young students or young professionals, three being aged between 20 - 30, two people aged between 30 - 35, and two aged between 40 – 50 years old. The participants were sourced through my network and snowballing, meaning that participants recommended other participants. All participants have an academic background, of which four participants had a specific background in engineering or design. A full list and description of participants is found in Appendix 2.



*Figure 8: The 8-step repair process (Svensson-Hoglund et al., 2022)*

# 2.3.2 Results Citizen Interviews

The outcomes of the interview are presented in the following. Each step of the repair process is illustrated with at least one quote, although also other answers were used in the analysis. A complete display of the analysis can be found in the Repair Journey at the end of this Subchapter (Figure 9).

**1. Predisposition**
*„My mom always went to the shoemaker, sometimes with me, so I do that too. "*

5 of the seven participants saw repairing as a positive experience or hobby project or would like to do it, to learn about their devices or acquire new skills. Three participants reported that they only buy objects of high quality, so they do not need to be repaired frequently.
Two participants had safety concerns about working with electronics or sewing machines, because of previous bad experiences. Friends and Family influence repair behavior by recommending repair shops and normalizing behavior. People see visiting professionals as the standard behavior, if they were exposed to this behavior during childhood. This is coherent with research by Godfrey et al. (2022).

**2. Event**
*"Then and now it sends me a message to descale it. And I never did that. And at some point, it stopped working. "*

*„It broke because I was not protecting it. And it still worked afterwards, so it was never worth to repair it. "*

For electronics, the exact event and reason for the item to break can often not be recalled. For clothing that needs to be repaired, the participants always knew why it broke.

**3. Investigation**
*"It's just not working anymore, and I tried to change the batteries but, I don't know what it is."*

Depending on the time of the breakage, participants searched for the error with the problem if it is not immediately visible. Still, especially with electronics, people stayed away from taking it apart or touching electronic or mechanical parts, afraid to harm themselves.

**4. Decision**
*„Yeah, I just need to set my mind to it. It is not like somethings is really withholding me from going to the repair shop. There is just nothing pushing me."*

The repair cost was mentioned several times as a barrier to having it repaired. Especially for expensive products, a warranty supports a repair decision.
Time, lack of skills and confidence are barriers to DIY

repairs. This confirms the findings from section 2.3. in other words. People reported if they repair it themselves, they want to do it the "proper way" or use it to learn. People attribute professional repair services with a cleaner, better-looking result and higher chances of success. For objects with a high financial or emotional value professional services are preferred since people are afraid to break something in the process. Since products cannot be used during the repair, if a product is used in daily life (smartphone, Laptop), the repair is postponed until it is completely broken. Getting a replacement device for the time of the repair is seen as convenient by the consumer.
Some consumers stockpile broken devices with the idea of fixing them in the future. If the item is functionally replaced, there is less motivation to fix the item.

**5. Arrangement**
*„I picked a repair shop, just across the street, because it was nearby. I heard from some friends that they had good experiences with them. "*

*„I was not sure if I could, like if the insurance would pay for it if I do not use a certified shop. "*

*"I can fix holes and sweaters, things like that. I want it to look good around the edges, so I am like, bring it to a professional, she has a sewing machine. "*

When researching repair possibilities, people search Google and ask friends. Distance to a repair supplier is mentioned multiple times as a barrier to repair. People preferred bringing their items to a store in the neighborhood than sending them somewhere. Submitting a warranty claim to the producer can be worrisome, frustrating, or pleasant depending on the quality of customer care.

**6. Diagnostics**
*„I asked him to replace the zipper, but he said, that the failure will then just happen again. He recommended a different, simpler solution. "*

Professional repairers can advise options that were not thought of by the consumer. In two cases the participant was impressed by the recommendation, since it meant that the consumer paid less than expected. One participant reported a fear of a condescending repair expert and asking unnecessary questions.

**7. Repair**
*„You must sit down, plan and take some time for the repair. "*

People have trouble finding time to repair something. Small repairs, such as sewing buttons were always done by the participants.

**8. Satisfaction**
*„It took the time to fix it. It is for the greater good, I think. Yes, so that is why I feel also like a hero after fixing it. "*

*„So, I am all for repairing clothes. Because I do not throw*

*away what is not necessary. But it will never be as good as new. "*

Successful Self-Repair is an achievement people are proud of. They share their experience and hope to be seen as capable. Clothing is perceived as less valuable after repair, and in case it is not used again after a successful repair.

### 9.       Repair Cafés
Three participants heard the term Repair Café but were not familiar with the concept or had not visited one before. Two thoughts of it as a professional repair service included in a coffee shop, not a community event. The other three have not heard of the concept. All participants were open to going there and liked the idea, although no participant had attended a Community Repair event before. Participants noted a lack of time and infrequent opening times as barriers to visiting.

# 2.3.3       Conclusion Citizen Interviews

Even though the consumer displays a positive attitude repair of products, they are held back by a lack of time, lack of knowledge and skills to perform repairs themselves. The biggest barriers for the repair of objects are cost and convenience. In the current system there is often a high motivation necessary to start the inconvenient and uncertain process of repairing electronics. While some breakages appear gradually, with an increasing loss of functionality, other devices break at one instance. Although some consumers are keen to investigate further at a later moment the device is stored for the moment. As soon as the item is functionally replaced, the motivation to repair the item lowers. These insights from interviews match the findings from section 2.3.

The interviews also confirm that a trigger is missing (see also 2.3.5 Fogg Behavior Model), happening at a time where the consumer could investigate further and potentially repair. People are happy to do DIY repair projects, when there is little too loose; for difficult or risky repairs such as computers or cameras, they prefer a professional service.

Most participants were optimistic about the idea of visiting a Repair Café, at least for items that are not of too high value or sensitive. Google and friend recommendations play the most crucial role in choosing a repair location. After a successful repair people are proud and happy to share their experience and are more likely to Self-Repair or use repair service in the future. People are afraid to harm themselves or break their items more while conducting a repair and prefer to ask professionals for help in these cases. Even people that enjoy repair projects have yet to visit Repair Cafés, even if it fulfils their need for support with knowledge and tools. Consumers are in support of the concept of a Repair Café but are not aware of them happening in their neighborhood.

The key takeaways from the citizen's interviews for consideration on the Design Proposal are:

•   General factors and barriers regarding repair propensity have been confirmed by Rotterdammers.

•   Participants are not aware of Repair Cafés in the Rotterdam area but react positively to the proposed service.

•   Although some participants plan to repair a broken item, they miss a trigger to follow through with their plan.

•   Repair experiences can impose a feeling of pride and capability. This will increase the likelihood of repairing in the future.

# Repair Journey of the Citizens of Rotterdam



| Stage | 1. Predisposition | 2. Event | 3. Investigation | 4. Decision |
|---|---|---|---|---|
| | *Attitudes, Values, Habits, Exposure* | *Breakage, Malfunction* | *Breakage, Malfunction* | *Assessment* |
| **Actions / Event** | • Wanting to buy high quality products that are long lasting<br>• low quality items are bought and used until they are not repairable anymore<br>• using clothing until its not repairable anymore<br>• Reusing broken clothes for cleaning | • Items brake accidently, because of a lack of care, through normal use, or because of design flaws<br>• People sometimes continue to use broken items with reduced functionality | • Using web search engines to find out what to do<br>• asking friends and family<br>• asking professionals when passing by a business | • plans to buy a new device in the future, will halt the plans to repa working but not fully broken de<br>• Replacing the item and stockpil one reduces the motivation to r<br>• Going to a professional if they w look clean, doing simple repairs themselves |
| **Quotes** | „I prefer to buy higher quality things when I can because I would rather just have a good one that lasts forever." - John, 41<br><br>„My mom always went to the shoe maker, sometimes with me, so I do that too." Maren, 26 | Then and now it sends me a message to descale it. And I never did that. And at some point it stopped working. Karel, 31<br><br>„It broke because I was not protecting it. And it still kind of worked afterwards, so it was never worth to repair it." Maren, 26 | It's just not working anymore and I tried to change the batteries but. Yeah, I don't know exactly what it is. - Maren, 26<br><br>But if it could be like 20 or less than €20 for a small like 5 minute repair. I think I would be willing to pay that. - Lauren, 29 | „Yeah, I just need to set my mind There's nothing really withholding going through the repair shop. There's just nothing pushing me"<br><br>I can fix holes and sweaters, thing I want it to look good around the I'm like, bring it to a seamstress, sewing machine. - Ann, 39 |
| **Needs & Pains** | • Unclarity about the final price of the repair<br>• Worry about Safety<br>• not using practical repair skills often and having to relearn them | • Not having time to conduct product care activities, such as descaling a coffee machine<br>• breaking something on accident while not paying attention | • Long distance to repair shops<br>• giving up because of lack of knowledge<br>• being afraid of high costs<br>• confusion and uncertainty of warranty<br>• a complicated and expensive looking repair<br>• shipping an item to the manufacturer | • plans to buy a new device in the future, will halt the plans to repa working but not fully broken de<br>• Replacing the item and stockpil one reduces the motivation to r<br>• being belittled by repair experts<br>• breaking the item more while tr it<br>• Not being able to use the item repair<br>• lack of trust in professionals |
| **Gains** | • family habits<br>• Having tools and materials available<br>• seeing repairing as a puzzle and fun activity<br>• Technical skills | • Understanding whats broken and seeing it as an easy repair | • New, expensive Unique and/or irreplaceable products are more likely to be repaired<br>• Helpful and fast customer support | • friends, neighbors and family th with tools and advice<br>• seeing repairign as a hobby,<br>• not depending on the repair to succesful<br>• Emotional attachment to the it repaired |

*Figure 9: Analysis of the Interviews*
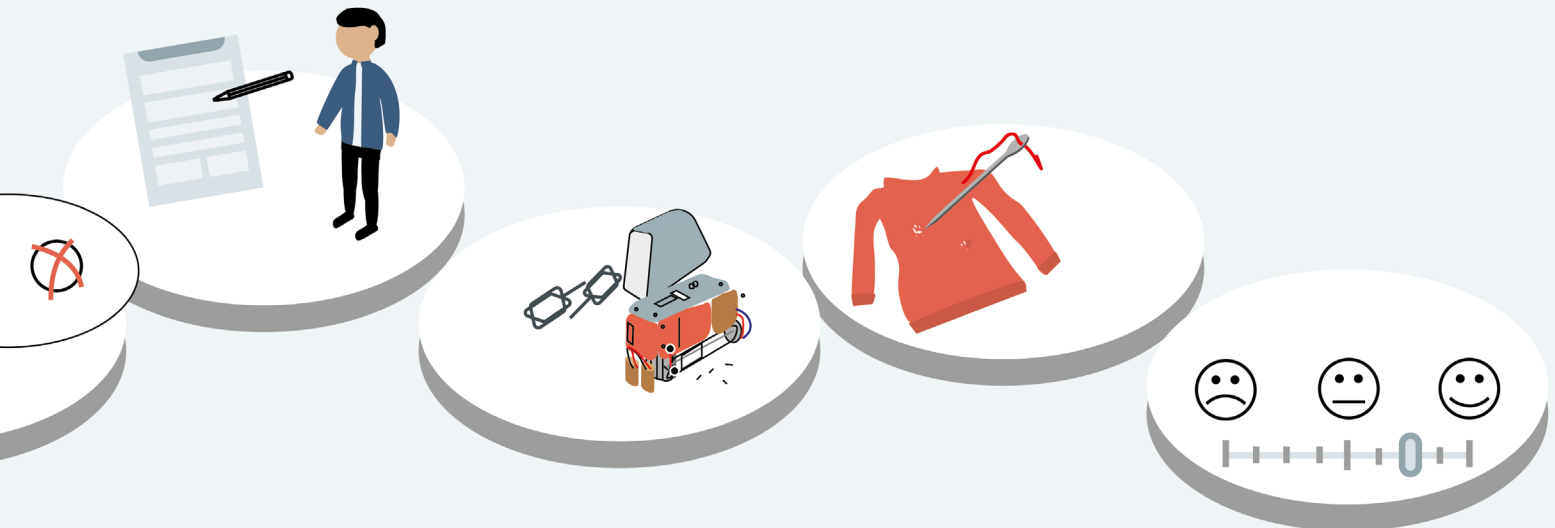
## 5. Arrangement

*Transportation to Repair Site*

## 6. Diagnostics

*Disassembly or visual inspection*

## 7. Repair

## 8. Satisfaction

---

**5. Arrangement**
- Using search engines to find out what to do
- Going to shops closeby
- contacting customer service
- arranging tools and material for DIY repair

**6. Diagnostics**
- opening the device
- replacing batteries
- getting suggestions for alternatives to repair by the professionals

**7. Repair**
- waiting for the repair to be finished
- requiring updates from the repair professional

**8. Satisfaction**
- leaving a review
- tellling friends and family
- disposing of the item if uncontent with the repair

---

*(partial) ...e near ...ir a ...vice ...ng the old ...pair ...vant it to ...by*

*...to it. ...m me from — Karel, 31*

„I was not sure if I could, like if the insurance would pay for it if I don't use a certified shop." - Maren, 26

„I asked him to replace the zipper, but he said, that the failure will then just happen again. He found a different solution."
Maren, 26

„It took the time to fix it. It's for the greater good, I think. Yeah, so that's why I feel also like a hero after fixing it". - Joana, 24

*...gs like that. ...edges, so ...she has a*

„I picked a repair shop, just across the street, because it was nearby. I heard from some friends that they had good experiences with them" - Joana, 24

„I'm scared of asking a stupid question or them asking a question i don't know how to answer"                                    - Joana, 24

„You have to sit down, make a plan and actually do take some time for the repair."
Gijs, 29

„So I'm all for repairing clothes. Because I don't throw away what's not necessary. But it will never be as good as new"
- Gijs, 29

---

*...e near ...ir a ...vice ...ng the old ...pair ...; ...ying to fix ...during the*

- Unclarity about the final price of the repair

- being scared about safety
- being afraid to destroy the item

- quality concerns over the use of non original parts
- the repair taking longer than expected
- not having the right spare parts available
- finding a trigger to repair
- finding enough time to repair

- Not using the repaired pants because they are not as good as they were before the product failure
- Being proud after the repair, but feeling bad when the fix breaks
- The repaired pant don't look as new, so they are not used again
- The repair was more expensive than expected but still worth the costs.

---

*...hat support ...be ...em to be*

- A repair shop closeby
- Neighbors borrowing tools
- Simple customer care that picks up broken item
- A replacement device provided for time of the repair

- If the repair looks simple and like something the person has done before

- Parts that are screwed in and are not glued or soldered
- having confidence from other repairs in the past

- Even when the repair failed the repairer had fun to tinker with the item
- feeling empowered after a success and being seen as more competent

# 2.4   Municipality & Upcycle Mall

This section will explain Rotterdam Circulair, the municipal program behind the setup of the Upcycle Mall and provide an analysis of the aspects of the Upcycle Mall and how they could support a repair function of the Upcycle Mall. Furthermore, I will provide a list of values of different Stakeholders of the Upcycle Mall, partly based on the interviews conducted, partly based on reports.

## 2.4.1 Municipal Action to support Repair in the City

Municipalities are the main local governmental bodies, and as such have an interest in both supporting their citizens and local businesses.
The Municipality of Rotterdam needs to support their citizens in the repair of items. To find out how this can be conducted effectively, it is valuable to look at recommendations from research but also examples and best practices.
Recommendations on how Municipalities can support in their cities have been made by various researchers and most recently the research project SharRepair. The EU-funded research project ShaRepair published a toolkit including ten actions that can be undertaken by local authorities. (ShaRepair, 2023). Among these actions are efforts to create awareness of the importance of repair via campaigning as well as improving the access to information on the local repair provision. Additionally, it includes action that supports professional repairers, Repair Cafés and the proposal for a new concept of a repair provision under the name Urban Repair Center.

Urban Repair Centers (URCs) are a continuation of the concept of urban resource centers and are fixed locations that provide repair services to citizens. To increase their approachability, they are usually set in residential areas (Ordonez & Hagy, 2019). They are commonly collocated with other businesses of the reuse economy such as secondhand stores, are most commonly only open for a few days a week and share a similar operator as the hosting business. There are various forms of URCs, an overview was created by ShaRepair in 2021. Because of the excessive cost of employees, URCs often collaborate with social enterprises or volunteer initiatives. This reduces personnel costs. The URC then fulfills the role as a training center. A variety of business models has been developed and tested, for example, at Maakbar Leuven (ShaRepair, 2022). Operating an URCs only on the revenue generated from repair is unviable, but there are concepts of offering repairs as an employment benefit by larger companies to their employees. In the Netherlands URCs are sometimes part of circulaire ambachtscentra, a governmental initiative to integrate local hot spots for crafts in the circular economy.

Additionally, ShaRepair calls for an introduction of repair to future generations. This is also found in other literature. Because previous repair experiences play an essential role in building confidence in repair (Nazlı, 2021) and thus increasing one's propensity to repair, it is critical to introdu
ce children to the practice and value of repairing at an early age (Korsunova et al., 2023). Learning the necessary skills to conduct simple Self-Repair tasks increases the consumers repair propensity (Korsunova et al., 2023; Lefebvre et al., 2018). The introduction of repair in school can be facilitated by teaching material provided by various sources, such as Stichting Repair Café (Stichting Repair Café, 2023.), Sharepair or Netz-

werk Reparaturinitiativen (Netzwerk Reparatur-Initiativen, 2017). There are various programs available, that target different age groups, like elementary school or secondary school. Additionally, to increase the repair propensity in the future, teaching repair educates on craft skills, lets people experience self-efficacy, increases the understanding of the functionality of technical devices, creates a consciousness for the protection of resources and increases the interest in technical and craft professions. (Netzwerk Reparatur-Initiativen, 2017). There are efforts to integrate repair as a subject for students of the products & services branch of secondary vocational education (Middelbaar Beroepsonderwijs (MBO)) (Repareren.nu, n.d.). An Illustrated list of the recommendations by ShaRepair can be found in Figure 8.

## 2.4.2 Expert Interview

To scrutinize research for Repair Services based on literature to a certain extent, I interviewed the senior lecturer at the Faculty of Industrial Design Engineering at TU Delft, Bas Flipsen. Bas Flipsen is researching the topic of Consumer Repair and Circular Product Architecture. He also volunteers in a Repair Café in Den Hoorn. The interview was conducted as a semi-structured interview in person at TU Delft on 30-06-2023 and lasted one hour.
To guide the interview, I used three guiding questions:
- Q1: What are the difficulties Repair Cafés face in providing their service?
- Q2: What can a municipality do to support a culture of repair in their city?
- Q3: What are the opportunities for a repair service at a recycling center?

The insights from the interview are compiled below:
**Q1: Repair Café Difficulties**
- Repair Cafés have an age problem, limiting the people attracted to joining them as volunteers or visiting them with broken objects.

- People facilitating a Repair Café or volunteering in one are often retirees with the time, motivation, and skills to work there.Because of the shift to a service economy, younger generations have gotten out of touch with products and have not learned the necessary repair skills.

**Q2: Municipal Support**
- Education in repair must start at a youthful age. Different concepts are available for that, for example, in elementary school.

- Repair Cafés can also be a first step to interesting children in trade jobs. If they enjoy it, they should get trained as electricians or mechanics later. Jobs that are in need now and in the future.

- Repair is interwoven with other making activities. Children who work with different tools are more prone to repair their objects. Repairing can be

**How Municipalities can support Repair in their City? (ShaRepair, 2023)**

**1**

**Join the Right to Repair Campaign**

- To show the support of EU and Nationwide Initiatives on improving Repair Governance, Citys can join the Right-to repair-Movement

**2**

**Promotion of Repair**
- By campaigning the city can make the public more aware of the benefits of repair
- Both community repair organisations and professional repairers can be put in to the spotlight.

**5**

Repair Cafe

**Supporting and Initializing Repair Cafes**

- Repair Cafe as volunteer organisation often have limited resouces for administration
- The city can further help with marketing activities, acquiring Subsidies, Supporting the search with a Location, help with acquiring volunteers
- Sharing Knowledge between the organisation

**6**

Repair Center

**Facilitate an Urban Repair Center**
- Creating one centratlised Hub that integrates both: different kinds of repair services and different kinds of awareness raising activities
- It relies on partnership of different actors in the repair sector.
- The creation of a sustainable business model is nescessary to ensure a longlasting success

*Figure 10:  Municipal Support for Repair in the city (ShaRepair (2023), own Illustration)*

**3**

### Introduce Repair to young generations

- There is an abundance of concepts available, many rely on the support of local community repair organizations
- For the success of the circular economy plenty of craft jobs need to be filled. Introducing repair can create an interest in those skills from a young age

**4**

### Monitor the results

- Since financial resources are limited a monitoring of the outcome, should ensure that only effective solutions receive are supported in the longrun
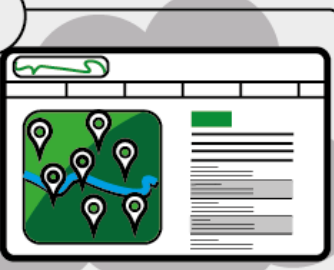
**7**

### Financial Incentives

- Several regions, citys or Countries (F. E. Amsterdam, France, Vienna) have piloted repair subsidy programs. Here Repairs are subsidised with vouchers up to a certain amount.
- Sweden reduced the VAT on Repairs activies

**8**

### Citizen Repair Websites

- Cities can host city wide repair websites, hosting a map of trustworthy repair businesses, local repair news, ongoing events and advice on repair in general

**9**

### Guide Citizens to the best repair solutions

- This can be done by making aware of the options for DIY-, Community- and Professionalrepair
- Consumers sometimes mistrust repair shops, Cities can give labels to certified repair shops

*Figure 11:* *Location of the Upcycle Mall in Rotterdam*

used in primary schools to teach craft skills, environmental problems, and resource conservation.

**Q3: Opportunities at a Recycling Center**
• Placing a repair service center at a Recycling Center can be highly effective, as people go there thinking about waste anyway. Even if they do not join immediately to repair the things they brought, they might plan extra time to try to fix something the next time. If the repair fails, the devices can be disposed of conveniently and recycled.

# 2.4.4 Location Analysis

To design a repair provision suitable for the location and circumstances of the Upcycle Mall, these first must be analyzed. In the following, the Location and Concept of the Upcycle Mall and Urban Repair Center will be analyzed to search for benefactors and barriers of a proposed Urban Repair Center. First, the physical Location of the Upcycle Mall in the city of Rotterdam is looked at. Second, the other activities on the compound; and third, the concept and parts of the Upcycle Mall itself will be analyzed. The analysis of the parts is based on the proposed plan of the Upcycle Mall as of August 2023. As the project is continuing to develop changes might happen too the future.

**Overall Location of the Upcycle Mall**
The Upcycle Mall is built about Zestienhoven in the suburban borough of Overschie. The location is in a business park bordering the airport. Although within

walking distance, the closest residential area is separated by a 6-way street and a train line.
It is suburban, on the north boundary of the city. Due to its location, it has little passerby foot traffic, although it is a large and frequented cycling route to the northwestern suburbs of Rotterdam, such as Berkel and Rodenrijs. It is a 15-minute bike ride from the city center and easily accessible by the Metro via the Station Meijersplein / Airport, a 5-minute walk away. It also lies conveniently close to Route N471, one of the main routes to Pijnacker and Zoetermeer.

The Compound of the Upcycle Mall can be separated into three concepts: the Recycling Center, the Doneerplein, and the Upcycle Mall Building.

**Recycling Center**
The recycling center will be where citizens will bring their waste goods to be recycled if possible. The center will offer containers for different waste streams, such as textiles, cardboard, metal, electronica, garden waste, and mattresses. The visitors drive up to the containers with their means of transport and drop their trash into them.

**Doneerplein**
Before the Visitors access the Recycling Center, they are guided through the Doneerplein. Here, valuable, more specific material streams will be filtered out before they enter the recycling containers. These materials are meant to be used by the users of the Upcycle Mall and organizations in Rotterdam. For instance, if a designer working in the Upcycle Mall requires green textiles, a container can be placed here to collect them

before entering the general textile containers. This makes reusing and upcycling the arriving waste more accessible since no sorting is needed later.

**Upcycle Mall**
Defining the activities at the Upcycle Mall is difficult to do since this development is still in the making and depends on what kind of renters are found to move in. Nevertheless, several activities are planned and are set to be tendered by the city to entrepreneurs.

**Offices for Circular Entrepreneurs, Makers, and Designers**
The Upcycle Mall will offer subsidized offices for small companies, artists, and designers with ambitions in the circular economy. They will be able to use the materials being donated at the Doneerplein. Examples are crafts such as furniture making, goldsmiths or sculptors. So, people that make high-value objects and not small promotional gifts.

**Educative Space**
The Upcycle Mall will have educative offerings to citizens and schools in Rotterdam. It is planned to have one large room available to conduct workshops and sessions to educate about the circular economy.

**Gastronomy**
To increase the quality of the stay and make the Upcycle Mall a place for visitors to stay and explore, it is planned to have a Repair Café at the site.

**Workshop Spaces**
The Upcycle Mall will include two workshop areas available to the renters of the Upcycle Mall to process the arriving materials.

**Concept Store**
The Concept Store will sell objects made or designed at the Upcycle Mall.

# 2.4.5 Unique Opportunities at the Upcycle Mall

To achieve the full potential of a repair provision at the Upcycle Mall the interventions should be adapted to the special local circumstances. While the location of the Upcycle Mall at the border of the city can be seen as a disadvantage, as consumers prefer convenience, some parts of the make-up of the Upcycle Mall, introduced in 2.4.4, provide unique opportunities. The following potential was found.

**Inflow of people**
There is a constant stream of people attending the Recycling Center; some can be attracted to the Upcycle Mall. Especially on weekends a larger share of citizens is expected. The recycling center as a universal public service is open to every Rotterdam citizen, displaying the wide variety of people projected to visit every now and then.

**Inflow of electronics**
Because of the location next to the recycling center and people bringing their broken or unused devices there, there is a constant stream of electronics available. WRAP (2011) reports based on a UK Survey,
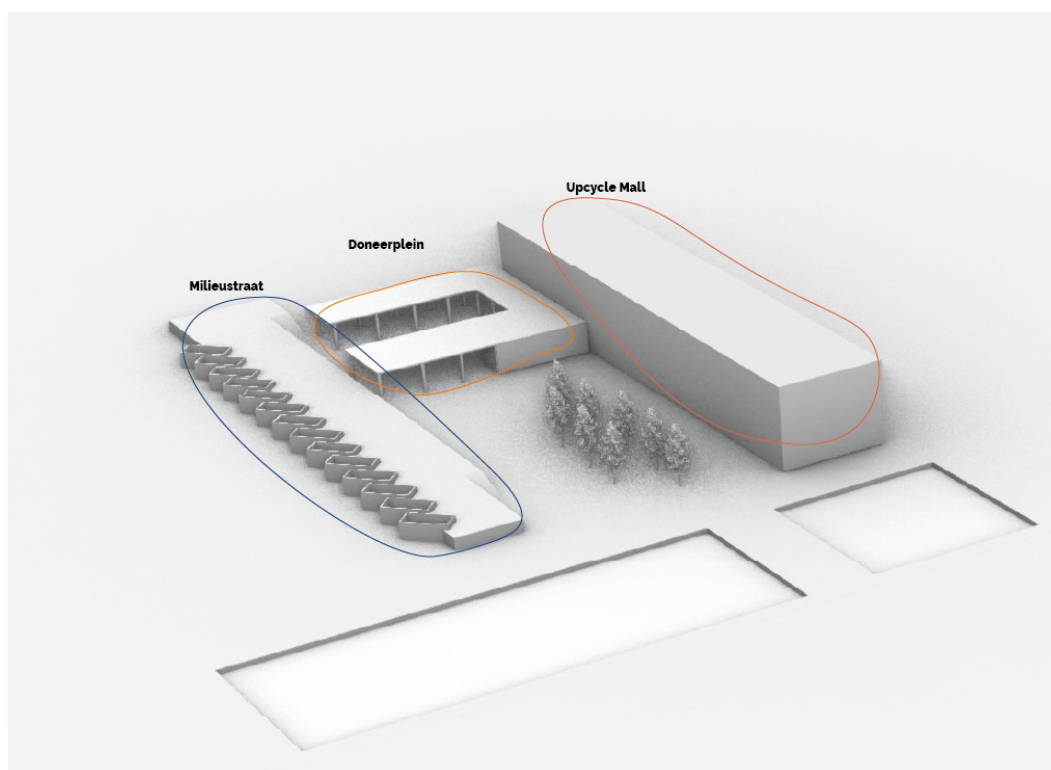


*Figure 12:* *Visualization showing the three distinct functions of the Upcycle Mall (Own Illustration)*

that 32% of items dropped off at recycling centers are believed to be fully functional. 56% of items discarded were believed to be resalable either in the current state or economical repairs by consumers. Although after investigation only 21% of devices had resale potential according to experts. Items that are being disposed of for other reasons than breakage, such as a new acquisition or a change of lifestyle. Furthermore, they found a low awareness for more resource-efficient options of disposal e.g. reselling or donating and even if made aware consumers tend to choose the most convenient option of disposal, throwing it away. Through this behavior, valuable resources are lost since WEEE has a low recycling rate. Additionally, the value of the marketable devices is lost. For the UK, WRAP projects the value of items including the price of repair at 104 million pounds or 121 million Euros. Once the device has been discarded in a waste container, it is classified as WEEE. An effect is that for the recovery of parts to further use in the repair of other items, a costly WEEELABEX certification is necessary for each employee is necessary according to EU Law (NVMP, 2014). If the items are donated beforehand, they are not considered as waste. This shows that it is necessary to filter still usable devices before they are discarded in the waste container.

### Visiting students for School Trips
The Upcycle Mall will be a location for field trips for schools and kindergartens, offering tours of the Recycling Center and workshops for upcycling waste material. The Upcycle Mall is also supposed to have an educational function for citizens. Educative measures will be supported by one full-time education manager.

### The "Doneerplein"
Before Citizens can access containers of the recycling center, they will place them in different containers to diverge specific waste streams, which are in demand by the occupants of the Upcycle Mall. The Doneerplein will be staffed by workers to support the citizens on the decision what is donate and what is disposed of. Functional electronic devices can be filtered out here, before they reach the waste containers.

### Convenient disposal in the correct waste stream if the item cannot be repaired.
Only 50 percent of electronics brought to a repair café can be successfully repaired (European Commission, 2018a). As convenience is an essential factor and uncertainty is also described as a hindrance to repair propensity, a convenient option of disposal is necessary. In the case of repair at a Community Repair organization the client must take the device home even after an unsuccessful repair. In those cases, the item could be disposed of in an incorrect manner, such placing it in the public. In the case of the Upcycle Mall a convenient recycling option is right in front of the door, countering the uncertainty by presenting a convenient option.

### A designated Repair Workspace
Most Community Repair Organizations in Rotterdam do not have a designated space but book meeting rooms in the community centers. A fixed repair workshop at the Upcycle Mall could lead to a more efficient repair process, by having the possibility to store devices and having better access to tools and measuring equipment.

### Co-location with social enterprises
Besides the professional for-profit repair services, many mission-driven social companies are involved in Rotterdam's reuse and refurbishment sector. One of the decisive goals of the Municipality for the Upcycle Mall is the creation of work opportunities for people with a disadvantage in the labor market.

# 2.5.6 Values of the involved Parties

For a RepairHub at the Upcycle Mall, different stakeholders have different objectives and values that need to be taken into consideration to increase the likelihood of a successful operation. Values can be defined as both guiding principles and as qualities with worth (Bos-de Vos, 2020). For the following list both definitions were considered. The following collection of values and needs of the different stakeholders involved are based on literature review and the conducted Interviews.

**Municipality** (General goals of the Upcycle Mall) (Gemeente Rotterdam, 2021)

- Having a low barrier for Rotterdammers to visit and being a place of interest to them

- Collocating a diverse selection of circular trades

- Offering Practical Maker Education

- Delivering the maximum achievable financial outcome

- Creating a maximum of work opportunities for people with employment handicap

- Low as possible administrative work for the Municipality

- Resources preserved as high as possible.

**Non-Profit Repairers** (Community center)

- Being of service to their community

- Doing something where they can apply skills and are proud of

**Citizens** (Interviews with consumers)

- Saving Money

- Convenience

- Avoid Uncertainty

- Fun in Repairing

- Learning new skills

- Support for questions related to repair.

**Social Enterprise** (Reuse & Reintegration Company)

- creating purposeful jobs to reintegrate people into the workforce.

- Having a distinct and individually adaptable work and development plan for each of the employee

- Giving a structure to the employees

**Repair Café Volunteers** (Neighborhood Initiative)

- Connecting with people from the neighborhood

- Repairing and learning together

- Teaching Skills

# 2.5.7 Conclusions Municipality & Upcycle Mall

In this section the organizational makeup of Rotterdam Circulair and the Upcycle Mall has been explained. Possibilities for the municipality to support their citizens in the repair of items were The Setup and components of the Upcycle Mall were analyzed, and unique opportunities were identified. This section ended with presenting a set of values of the key stakeholders of the Upcycle Mall.

From the research the following conclusions can be made:

**Opportunities for the Municipality to promote Repair Services**

- High importance of addressing young people to repair to share skills for Self-Repair, attract new volunteers to Community Repair organizations and make the importance of the circular economy tangible to them.

- Several concepts for education of young people on repair exist and are designed to be adapted to local circumstances. There are different workshop concepts for primary and secondary schools. Workshops are often conducted in a collaboration of a school and local Repair Cafés.

- The setup of an urban repair center fits the goals of the Upcycle Mall. A large variety of examples of this setup already exists, dependent on external partners as supporters and operators of such a space. Different business models are being tested, but there is no functioning business model that has been tested. Since they do depend on outside partners, such as social enterprises or volunteer initiatives, the initiation is heavily dependent on their motives.

**Opportunities of the Upcycle Mall**

- The location outside the city is remote, and although a primary cycling route out of the town passes by, there is little foot traffic. A RepairHub can, therefore, not count on being used directly by the neighborhood but needs to target visitors to the Upcycle Mall and the Recycling Center itself.

- The potential enterprise or repair setup needs to be able to sustain itself and pay rent to the city through direct revenue or donations and grants. This is, therefore, singling out Repair Cafés since there is a doubt that they are not have a sufficient size to create a high enough stable income that can sustain renting space.

- Because of the little integration in the neighborhood, it is expected to have few passersby visitors, so a design solution should either focus on the visitors of the recycling park or create a reason for Rotterdammers to visit the location.

- Because of the location next to the recycling center and people bringing their broken or unused devices there, there is a constant stream of electronics available. Many of these devices are not broken or could be resold with minor repairs (WRAP, 2011)

- The Doneerplein poses an excellent opportunity to preserve the items before being discarded.

- The Municipality wants the Upcycle Mall to fulfill an educational function with a focus on the circular economy. It will welcome classes of students on field trips. This undertaking will be supported by an education manager. Besides a tour and explanation of the recycling center, a hands-on experience of the circular economy could be presented through a repair workshop.

# 2.6 Conclusion Context

So far, this thesis has looked at Consumer Repair in Rotterdam focused on electronics and textiles through five lenses. The first lens "Repair Provision" reviewed common repair alternatives. The second lens analyzed typical "Consumer Behaviour" when it comes to repairs. The third lens was a reflection on repairs based on interviews with citizens. The fourth lens focused on current activities in Rotterdam. And the fifth lens looked at Rotterdam Circulair and the potential of the Upcycle Mall. In this Conclusion Section, the insights from the different lenses are synthesized to provide a basis for the design proposal. The conclusions are combined into five subsections, but continuously numbered to allow a more comprehensible reference later in the thesis.

# 2.6.1    Citizens Barriers

The first research question "What barriers do Rotterdammers experience in repairing or having their belongings repaired?" (see section 1.5) was answered through the means of a Literature Review, a series of Interview, and an analysis of the local repair provisions.

### 1.    Consumer Barriers

The Citizens face a variety of barriers depending on the mode of repair. For the Self-Repair of items, citizens are held back by a lack of time, skills, knowledge as well as access to tools. The lack of knowledge also negatively impacts the repair at Repair Propensity at professional repair shops. Additionally, the expected cost for the repair and the uncertainty about the outcome of the repair and the price play a major barrier. For Community Repair citizens face a lack of knowledge of them, as well as difficulty finding reliable information. Additionally, a lack of time and motivation decreases the likelihood of using the provision, even when the citizen knows about them.

### 2.    A trigger for repair

In the consumer interviews it was shown that even consumers who have enough motivation and ability to repair, they are lacking a trigger to do it. The city can address the motivation to repair by creating awareness for its citizens and focusing on the benefits of it, as well as increase the ability of citizens by offering an accessible and enjoyable repair service. A visit to the recycling center should become a trigger for citizens to repair their belongings; both at the Urban Repair Center as well as the local Repair Cafés.

### 3.    Encouraging Repair in Rotterdam to increase Motivation

A higher rate of repair of textiles and consumer electronics is necessary for the circular economy. The consumers' motivation to repair needs to be increased. To achieve a higher rate of repairs, the Municipality can raise awareness for its citizens to show that repairs are not only often cheaper, but they are also environmentally friendly and can be fun. Since economic reasons are relevant to the motivation to repair, the Municipality can support its citizens either through a directly or indirect subsidized repair scheme. This can raise the demand for repairs at professionals as well as for Repair Cafés, though it depends on a political will and the availability of human resources.

# 2.6.2    Community Repair Barriers

### 4.    Repair Cafés are valuable actors for Rotterdam Repair Culture

Currently, for out-of-warranty repair of small household devices there is no professional option in Rotterdam, although there are plenty of providers for the repair of textiles and ICT equipment. As an alternative, Self-Repair can be convenient because people can do it on their own terms, in their own free time. But it requires skills, knowledge, and tools only a few people have or have the time and money to acquire. The Community Repair organizations fill that gap and take place in the neighborhoods, making it convenient for citizens to pass by. The effectiveness of this repair offer to citizens is limited since they mostly take place in infrequent rhythms of once a week or once a month. As an organization dependent on volunteer work, they can also be unreliable in their opening times, as well as the service quality. Because of the many different Repair Cafés in Rotterdam and their diverse backgrounds (e.g. neighborhood initiative, integration offer) the service they offer varies throughout the neighborhoods and citizens do not know what to expect. Although all the people I interviewed were open and excited about the idea of a Repair Café, none of them had visited one, some of them not even being aware of how close they live to them. Even Repair Cafés have their shortcomings as a repair service, they are often as said the only option. Their significance in the repair sector is increased by the other values they fulfill that promote repair and the circular economy and repair, such as pedagogy, social cohesion and working as change agents (Moalem et al. 2021). Therefore, a city's strategy to increase repair services needs to include and to empower them.

### 5.    Large Variety of local Community Repair organizations

There is no unified voice or major institution advocating Community Repair in Rotterdam, but many single actors and initiatives in different areas. This makes support through the Municipality more difficult because goals and values might be different for the different institutions. It also decreases their effectiveness in spreading a repair culture in Rotterdam. Although Rotterdam has in comparison to other cities no single large Community Repair institution, the substantial number of Repair Cafés is remarkable. Through their placement in the neighborhoods, they act very locally. Furthermore, the diversity in organizational structures, ways of working and identity is significant, and the visitor should be made aware before their visit, to match their expectations.

### 6.    Overcoming the Information Gap

The interviews with Consumers revealed that despite their positive connotation, the consumers barely use the Repair Cafés and are often not aware of them operating in proximity. The mapping exercise showed a likely reason is the unreliability and inaccessibility of information on time and location of them happing. Sharepair, (2023) proposes this as a field of action for support of the Municipality and the Upcycle Mall can play a role here. The placement next to the recycling center allows to communicate to diverse groups that are out of reach of the community center network. Additionally, a repair website can become a reliable source of information for Rotterdammers when they are not at the Upcycle Mall.

# 2.6.3    Actors to be involved in the Urban Repair Center

### 7.    For-Profit Repair Services are not the answer:

With the repair of consumer goods, it is hard to make a profit as a standalone service (Sharepair, 2022). Through my research it has become clear that a for-profit repair service is not a viable business model even at the Upcycle Mall. The Interest of most large companies to offer Repair services is still to attract people to come to their stores, creating revenue through additional purchases. The involvement of not-for-profit repair organizations is detrimental as well as providing value for them.

### 8.    Including Repair Cafés and Building a Repair Network:

The involvement of Community Repair is detrimental. The visits and interviews at the local Community Repair organizations informed me that they are too small, have too little continuity and are thus unreliable as a partner. Furthermore, one of their priorities remains in staying local and providing a service in their own neighborhood, and not at the somewhat remote location of the Upcycle Mall. Currently they are the biggest advocacy group for out of warranty repair in Rotterdam, although they are not organized between each other, which limits their effectiveness in promoting their goal. The creation of a network is seen as vital to promote the issues of the circular economy and facilitates the support though the Municipality (Lechner et al., 2021). The Upcycle Mall can be a place to connect these organizations and start building a repair network.

### 9.    Collaborating with a WISE

Thinking about how an Urban Repair Center would operate involves collaborating with social enterprises. A for-profit repair service is almost impossible to create under the current system. Teaming up with social enterprises is the best bet for the Municipality. Future repair services need to fit in with what these socially driven enterprises need and value. The interview with volunteers at the Repair Café De Esch showed that electronics is a meaningful and fun activity. Repairing also teaches skills that are in demand in a circular economy.

## 2.6.4    Focus of the Urban Repair Center at the Upcycle Mall

### 10.    Rekindling Repair Behavior

A visit to the Urban Repair Center can be the spark for more repair behavior in the future. Nazlı (2021) proposes that past repairs experiences will increase repair propensity in the future, while Korsunova et al. (2023) identifies that a successful repair is not even necessary for that. At the URC the visitors should be made aware of their local repair providers, namely the Repair Cafés. This can help overcome the inconvenience of repair providers being far away, consumers mentioned in one of the interviews conducted. A visitor to the Urban Repair Center should be proud after their visit and motivated and able for the next repair. The feeling of pride can be achieved through a memory object to take away. By kindling that first spark the first of many steps is made for a habitualization of repair.

### 11.    Focusing on small electronics for a collaborative repair service

For the repair of clothing and electronics different skills and tools are necessary, and to avoid the creation of an unused service the needs of citizens must be considered. In the Interviews with consumers, it became clear that people have the necessary skills to conduct small fixes on their clothes themselves, which corresponds to the existing literature (Diddi & Yan, 2019; McLaren & Mclauchlan, 2015). Additionally, in comparison to electronics, the provision of textile repair professionals in Rotterdam is plentiful, and people bring their clothing to these local professionals. In the case of electronics, there are no open service providers for household electronics, especially because of the discussed non-viability.  The make-up of the Upcycle Mall.

### 12.    Upcycle Mall's Potential as an Urban Repair Center

Although the location is on the outskirts of the city, which is inconvenient as a repair provision, the Upcycle Mall combines multiple unique opportunities for such a provision, e. g. the colocation with a recycling center. This allows us to attract users outside of the current network and reach Community Repair organizations. A designated workspace for repair can increase the efficiency of repairing by easier access to tools and an environment made to repair.

## 2.6.5    Activities at the Upcycle Mall

### 13.    A Mix of Offerings

Knowing that one service will not cover all the costs, a mix of offerings makes more sense. This approach addresses the various challenges Rotterdam faces in the repair world. This also maximizes the use time and allows for functions to happen that wouldn´t warrant a full-time occupancy, such as the education of children. The mix of offering can also allow for synergies to happen, making the operation of the Center more effective.

### 14.    Repair Provision at the Upcycle Mall

Increasing the motivation to repair is still insufficient if there is little ability to complete repair. The Upcycle Mall should therefore provide a walk-in repair service for citizens visiting the recycling center. It should overcome the barriers Repair Cafés face, such as reliability or a non-permanent workspace. The service should both be a source for advice if a repair is feasible after a diagnosis and a practical guide, that conducts the repair together with the consumer. Data from the Repair Monitor (2023) suggests that many devices can be fixed by cleaning and without the need for additional parts. If replacement parts are necessary, the repair expert should support with ordering the right part.

### 15.    Sorting and Fixing Electronics can fulfill various values for the Circular Economy

The Upcycle Mall can do even more by becoming a hub for fixing electronics. This involves fixing electronic devices and refurbishing them for resale on the second-hand market. According to (WRAP, 2011) 23% of WEEE has a viable resale potential, including the cost of repair and cleaning.  Increasing the availability of high value and clean, reusable electronics accelerates the circular economy and facilitates purchasing secondhand goods (Cole et al., 2018). This takes advantage of the location at the recycling center and the concept of the" Doneerplein" to filter out still usable items and material before they go to recycling. The interview with Het Goed revealed that there is currently no such place in the company but would facilitate everyday operations.

### 16.    Repair Education for Young Citizens

The need to instruct young people repair skills is widely recognized by experts. The education of repair skills can support education on the circular economy and makes it tangible.  There are several concepts for repair workshops available, that can be adapted to fit the need of the Upcycle Mall. Education is also one of the goals of the Upcycle Mall and school classes are projected to visit the adjacent recycling center. This makes the Upcycle Mall a suitable location for the education on repair.

# 3. Design Requirements

## 3.1 Design Statement

To bridge from the insights to the Design Proposal, a statement was crafted, that higlight the main objective of the Design. From this five subtasks were derived.

"**Design a self-sustaining Urban Repair Center that uses its location to act as a trigger to repair at the Upcycle Mall, introduces the Community Repair Concept, educates the citizens of Rotterdam on repair and links to and promotes the local Community Repair Organisations.**"

**1** Design a Repair Service that acts as a first trigger to rekindle repair behavior and suits the needs of visitors of the Recycling center

**2** Make visitors of the recycling center aware of the Repair Service at the Upcycle Mall and the Repair Cafes throughout Rotterdam

**3** Design a Repair Function as an additional value proposition for a Work-Integration Social Enterprise

**4** Adapt a program to educate young citizens on Repair at the Upcycle Mall

**3** Create suitable information material linking to the Repair Cafes in the Rotterdam and support the overcome of the visibility gap

# 3.2 Design Requirements:

The following requirements for the proposed design are derived from the conducted research and conclusions:

### Partner:
Since the Municipality cannot operate the RepairHub by itself a Partner must be found. Reintegration and reuse companies exist in Rotterdam and have experience both in hosting Volunteer and reintegration Workers and the resale of electronics. The RepairHub should integrate and connect the Repair Cafés in the Neighborhoods and guide the visiting citizens to them.

### Staff
The Sort and Fix activities should be conducted by a team of the social enterprise and people at a distance from the workforce. They should be open to volunteers joining if done regularly.
The Repair Education activity should be organized by the Manager for education activities at the Upcycle Mall, although the workshops themselves should be conducted together with volunteers from different Repair Cafés in Rotterdam.

### Revenue Model:
Because of the non-viability of out of warranty repair for small electronic devices, the RepairHub requires an alternative Business Model in comparison to a Fee-for-Service-Model. It needs to fulfill values for a partner organization to cover the costs of rent. The location of the recycling center could be used to facilitate remarketing of used electronics.

### Repair Service:
The RepairHub should be positioned between a professional service and community repair, to overcome the service inconveniences of unreliability, infrequent opening times and in comparison, to non-profit repair it should also include the client in the repair, like a Repair Café, to educate and spread knowledge and skills. The Service should create an environment for people to learn about repairing and overcome with a feeling of pride after the repair and reduce frustration. After an unsuccessful repair attempt, discarding the device should be made convenient.

### Location:
The workshop needs to be designed in a way to facilitate a variety of activities. Since the space is limited to 75 Square meters, some activities might need to take space on an irregular basis in the Education or Meeting Rooms of the Upcycle Mall. There should be space for both Community Repair and repair by the experts alone. Additionally, storage space is necessary for the devices repaired at the Upcycle Mall. The focus is on small household devices and consumer electronic, meaning that the space necessary should cater to them.

### Clients:
The Urban Repair Center should fulfill a variety of roles:
It should attract people dropping of things at the recycling center (walk-in clients)
It should attract people who plan to visit a repair café and want reliable opening times and know what to expect.

### Collection of WEEE
The collection of WEEE should be done with consideration of minimizing effort and avoid an overprovision of broken or unsellable devices at the Repair Hub.
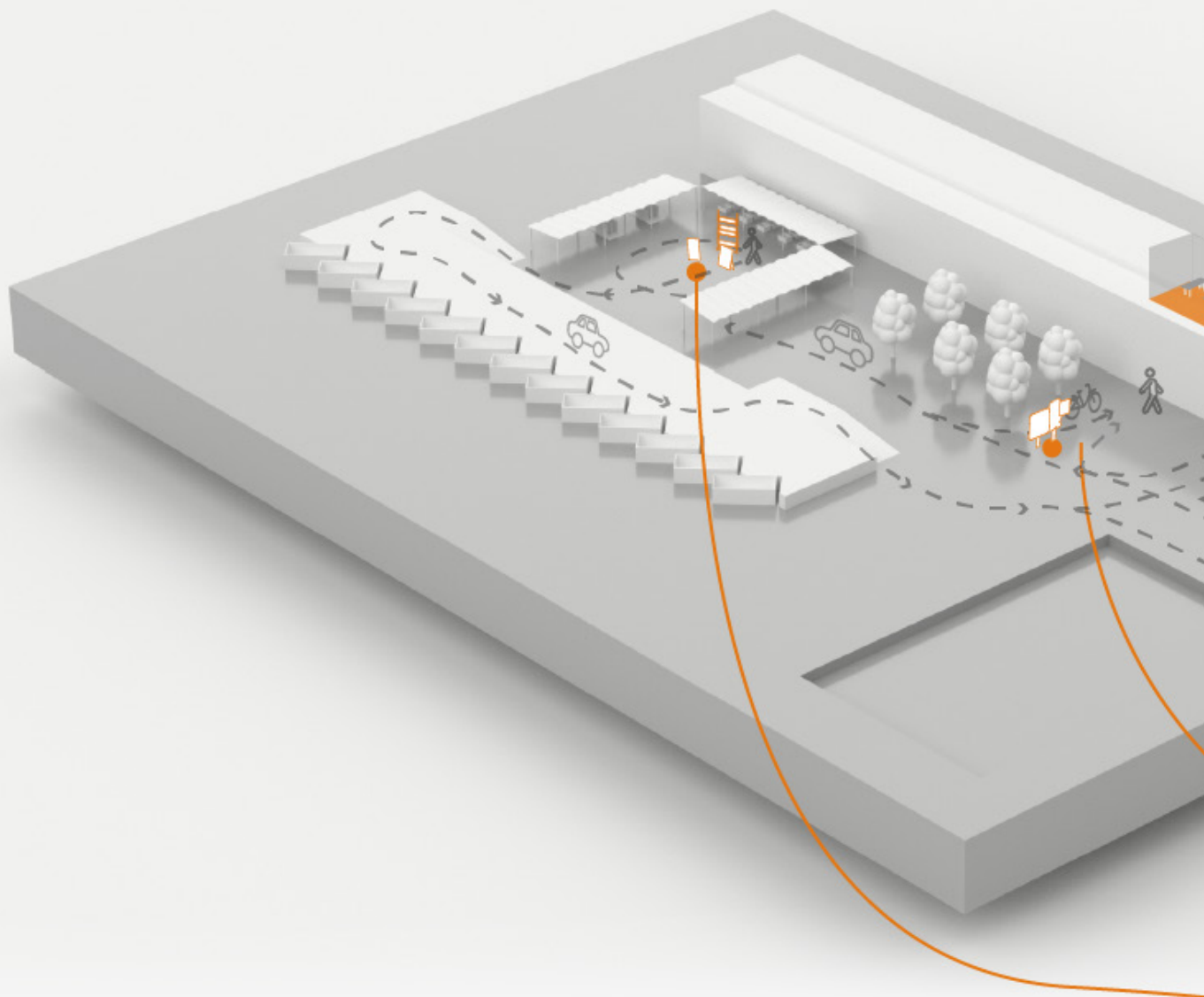
### Communication:
To capture the attention of visitors and attract walk-in clients, the option of repairing at the RepairHub can be brought to their attention several times during the approach. The many options for community repair should be advertised to people who do not have time to repair now. To attract citizens to both the RepairHub and the Repair Cafés, the values of repair to the citizens should be highlighted. The concern of costs should be addressed, but also the little time needed, the fun it entails, and the environmental consciousness should be appealed to. Communication on Repair Cafés should be simple to update, because of the inconsistencies in time and location. To manage expectations, the mode of operation, skills and activities should be communicated. It should be highlighted that those are volunteer activities.
A website should be trustworthy, easy to adjust and leave room for adaptions and changes.

Figure 13: Logo of the RepairHub

# 4. Design Proposal

Offering only one single service with a repair function at the Upcycle Mall, would not only be ineffective to meet the variety of problems surrounding repair the citizens are facing, but would not be viable and would not building a space for the repair of consumer electronics for one space for the whole week. Therefore, the design proposal is a concept that integrates several functions and can align with the values and needs of the stakeholders. The concept proposes a Work Integration Social Enterprise to rent and operate one room of the Upcycle Mall and conduct and help to conduct several activities here under the name RepairHub. The name RepairHub should display the outreach of the functions of the Urban Repair Center and the influence it has all over Rotterdam.

The design proposal consists of 8 concepts and is divided into three subgroups: The RepairHub activities, the Signage System at the Upcycle Mall and the Awareness for Repair Provisions in Rotterdam, displaying how the Upcycle Mall can fulfill a role as a center for the repair in Rotterdam. This chapters starts with an overview of of the different parts of the design proposal (Figure 14)

Figure 15 shows how the conclusions from the research inform the design proposal. Afterwards the individual parts of the RepairHub will be presented. Three user journeys narrate how a user would experience their visit. The range of concepts are only partly interdependent and have synergies that are discussed in section 4.7, the Value Map.

# RepairHub Overview



**Awareness for Community Repair in Rotterdam**

**7. Repair in Rotterdam Webplatform**

Webplatform showing Location, Opening Times and Profile of Community Repair Organizations in Rotterdam

**8. Repair in Rotterdam Map**

Z-Fold Flyer showing Locations and Opening times of Community Repair Organizations in Rotterdam

*Figure 14: Overview of the Design Proposal*

**RepairHub Activities**

1. **RepairTogether**
   Consultation of Citizens and the Repair of Items together with them

2. **Sort and Fix**
   Sorting, Cleaning and conducting small economic fixes on items to be resold at Rotterdams second hand stores

3. **RepairEducation**
   Educational Workshops for School Classes

**Signage System at the Upcycle Mall**

4. **Attention Billboard**
   First Billboard to make Citizens aware of the RepairTogether offering at the Upcycle Mall

5. **Map Billboard**
   Second billboard showing the way to the RepairHub and the location of the different Community Repair Organization in Rotterdam

6. **Doneerplein**
   Location where reusable electronic devices or devices with reapirable defects can be donated to cleaned and possibly repaired in the RepairHub

# Conclusions influencing the Design Proposal



**Actors to be involved**

① Consumer Barriers

② A trigger for repair

③ Encouraging Repair in Rotterdam to increase Motivation

**Community Repair Barriers**

④ RCs are a valuable actor for Rotterdams Repair Culture

⑤ Large Variety of local RCs

⑥ Overcoming the Information Gap

**Actors to be involved**

⑦ For Profit Repair Services are not the answer

⑧ Including RCs and building a network

⑨ Collaborating with a WISE

**Focus of the URC**

⑩ Rekindling Repair Behaviour

⑪ Focussing on small electronics for a collaborative repair service

⑫ The Upcycle Mall's potential as an URC

**Activities at the URC**

⑬ A mix of Offerings

⑭ Repair Provision at the UM

⑮ Sorting and fixing electronics provides several values CE

⑯ Repair Education for young people
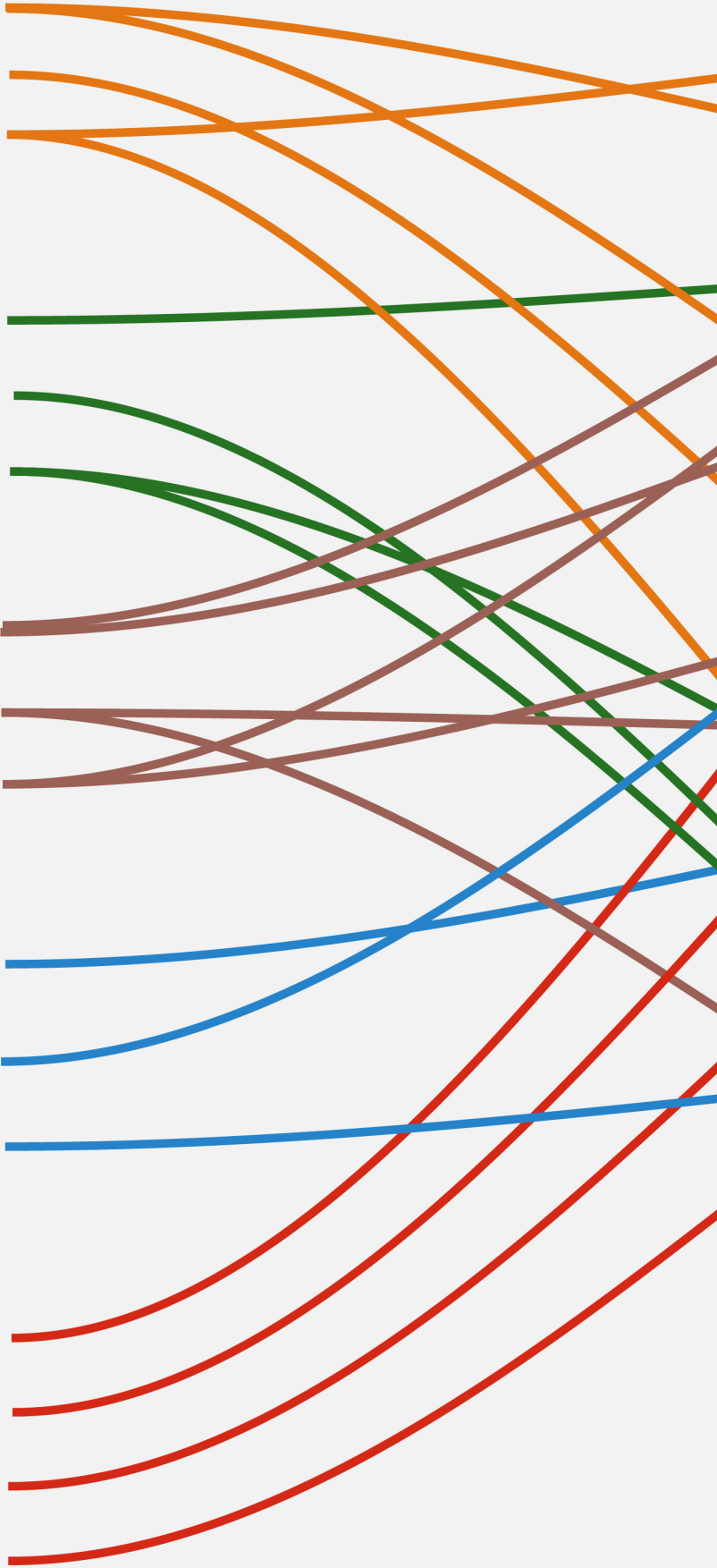
*Figure 15:* *Diagram connecting the conclusions from the Research to the Design Proposal*

RepairHub (General)
3 7 9 13

RepairTogether
1 4 7 11 14

Sort & Fix
9 15

RepairEducation
1 8 10 16

Signage System
2 6 12

Outreach
3 5 6 8

Website

Z-Fold Flyer
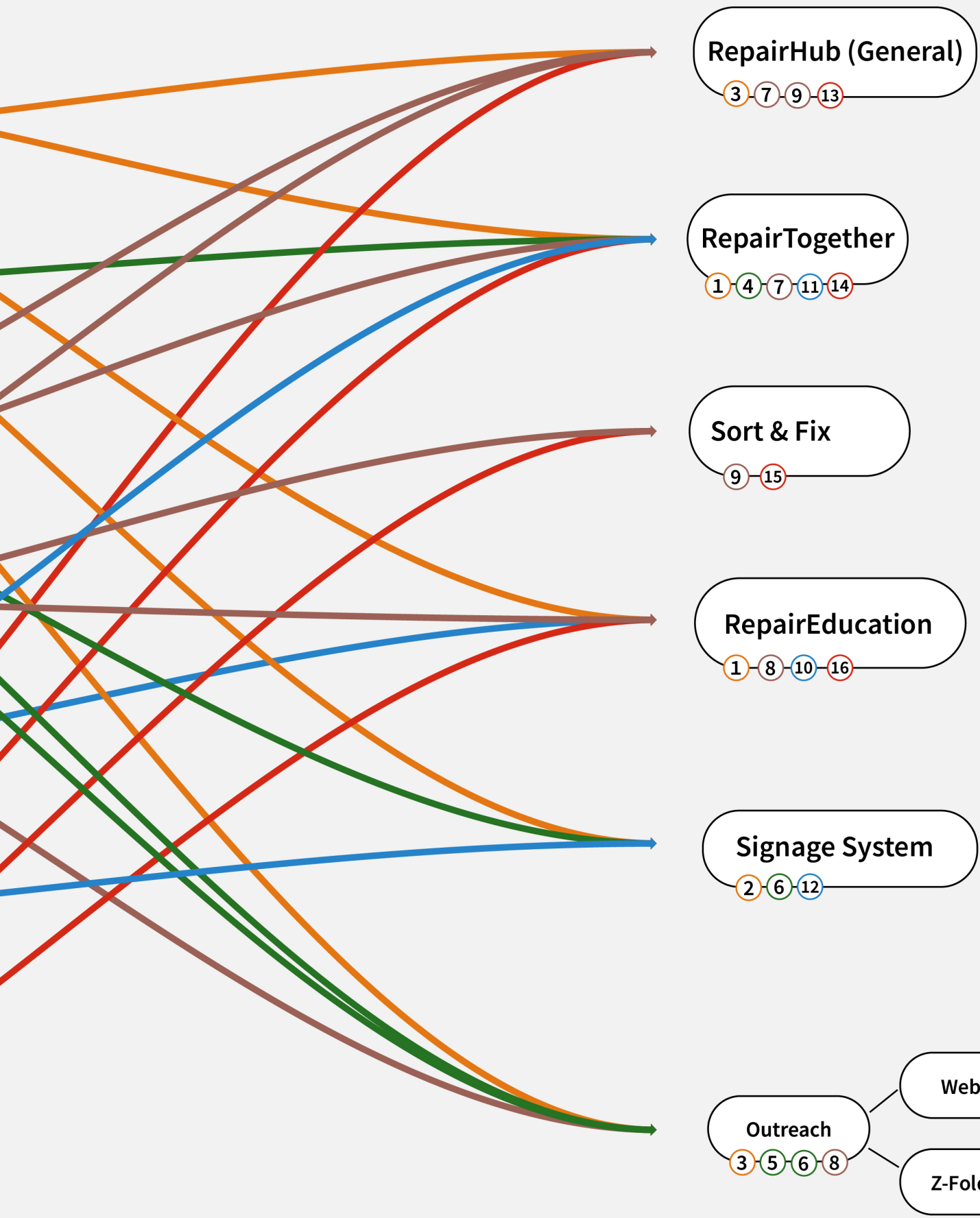
## 4.2  RepairHub Activities

At the RepairHub three repair-related activities take place each week. The activities RepairTogether, Sort and Fix Center and RepairEducation are explained on the following pages.

### 4.2.1    RepairTogether (1)

For passerby visitors a visit to the RepairHub should be seen as a last option before donating or disposing of the device. Even if a repair attempt is unsuccessful or the citizen has definitively made his mind up on the disposal, a repair attempt will spur more repairs in the future and introduce the concept of Community Repair, and the provision of Repair Cafés in Rotterdam. The goal is to offer a low barrier repair service adapted to the concept and location at the Upcycle Mall: as there is currently no repair infrastructure for the out-of-warranty repair of small electronics, besides the local Repair Cafes, that come with the caveats of infrequent opening times This all kinds of repair awareness campaigns can only guide people to the local Repair Cafés. The RepairTogether service should fill this gap by being reliable and easy to find alternatives for people that planned their repair. Additionally, it should be a resource for Self-Repairers if help is needed.

RepairTogether is a walk-in repair service at the Upcycle Mall where visitors can repair their electronic devices under the guidance of an expert. The service focuses on two kinds of groups: Visitors to the recycling center, who encounter the possibility of repair upon their arrival at the recycling center and people, who plan to visit the Upcycle Mall to repair their objects. Most "Passerby Visitors" of a recycling center intend to throw away items that they bring to the recycling

center and have already replaced them with functional ones. This reduces the motivation even further to repair an object. A repair service at the Upcycle Mall should focus on giving quick advice on the repairability of a device and help to conduct repairs directly, if possible. Common spare parts such as fuses and cables should be kept in stock to allow changing if needed, as well as cleaning agents and equipment for maintenance, such as lubricants and descaling fluid. If non-standard spare parts are necessary, the volunteers assist with sourcing the right part either via a local shop or the internet. The visitor should then acquire the part themselves and either return or visit a Repair Café in their neighborhood. The proposed process of a customer and the operational necessities can be read in Figure 17, the Service Blueprint. For people that plan their visit, the repair service should be foremost reliable, but also give a convenient option to discard the device if the repair is unsuccessful.

Repairs will be conducted on portable electrical and electronic devices and appliances, such as IT and telecommunication equipment, leisure and sports, lamps, power tools and coffee machines. The RepairTogether function is operated by volunteers under the umbrella of the WISE company. The operational size and experience with handling and recruiting volunteers, can facilitate consistency and reliability.  Additionally, it should be a resource for Self-Repairers if help is needed. To let the visitor display their pride of a successful repair a sticker can be optionally placed on the repaired device (Figure 18). In the continued use of the device, this should work as a reminder of the repair, and advertise community repair and the RepairHub in Rotterdam.With the RepairTogether offer the RepairHub addresses the identified need for reliable repair provision for electronic devices in Rotterdam, by adapting the concept of Community Repair to the circumstances of the Upcycle Mall.
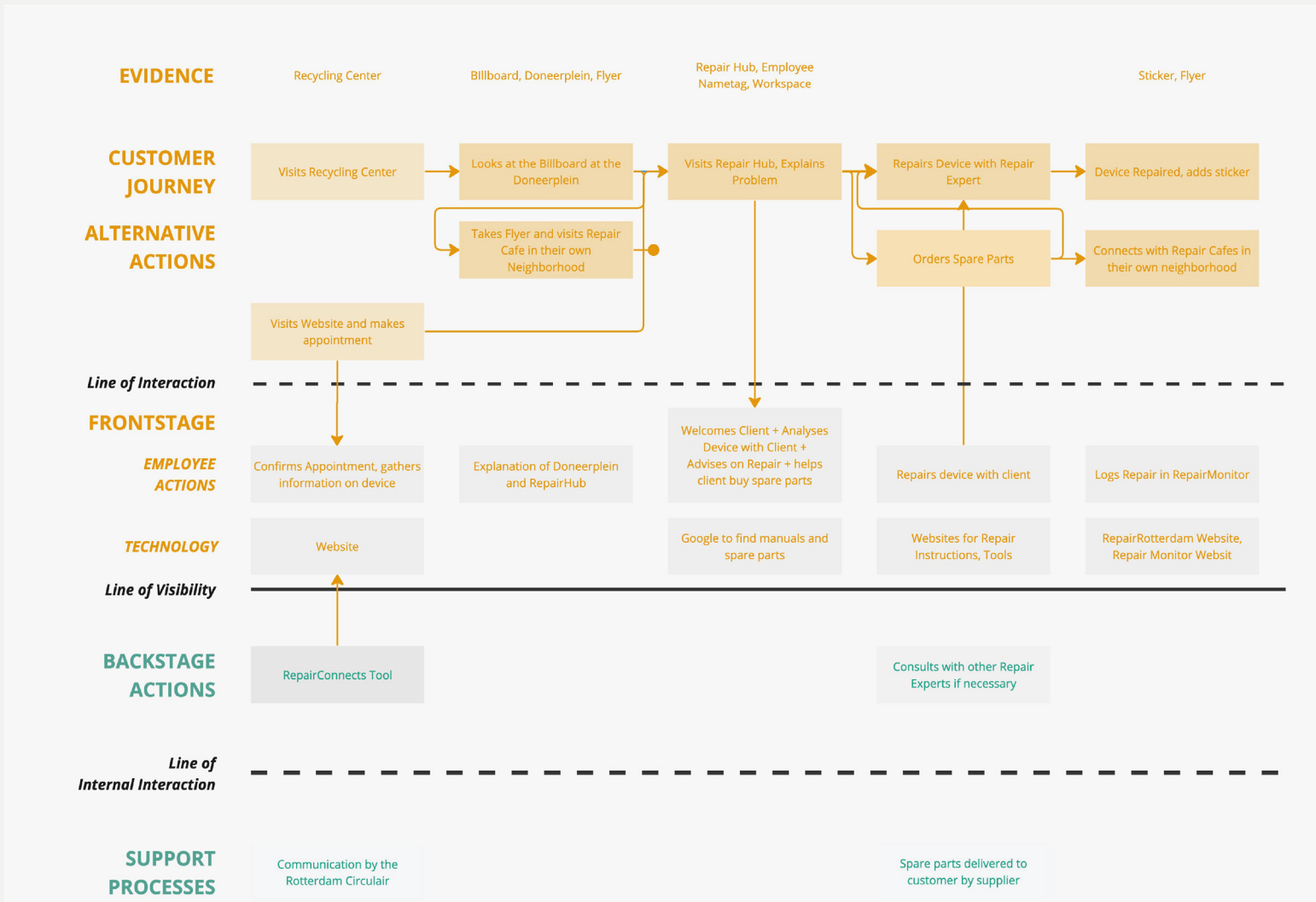
*Figure 17:* *Service Blueprint of RepairTogether*

Repair Pride Sticker



*Figure 18:* *Repair Pride Sticker*

### 4.2.3   Sort and Fix

At the Recycling Center, citizens will deliver various electronic and electrical devices. Some of them are broken beyond repair. Others can be filtered out before being recycled on a material level to give them a second life (see Section 4.4) Before the devices are returned to the market, they must be checked for functionality to ensure that only functioning devices reach the customers. Also, the RepairHub can conduct simple and cost-efficient repairs for devices with a high value and resale market demand. For example, many pieces need to be cleaned only or otherwise maintained to work correctly again (Repair Monitor, 2022). Therefore, a variety of maintenance products, such as descaling fluid, lubricants, oil and sealing rings should be kept in stock.

Because of the short distance to the Recycling Center, the Upcycle Mall presents a suitable location for such a facility. It ensures that the coordination is simple and efficient. The amount of work can be steered and adapted to the workforce through the accepted quality of devices for resale. Additionally, the RepairMonitor can suggest filtering out items with a low chance of a successful repair, such as printers. By requesting the donors of the items to indicate on a sticker what is broken, the test and repair steps can be conducted more efficiently

The process from being donated to being resold is described in six steps (Figure 19).

**Step 1:**
Reusable Electronic and electrical devices need to be collected. At the Upcycle Mall, this can happen at the Doneerplein by placing a container for still useable devices with or without minor defects. A worker of the Doneerplein pays attention, that only items are put into the box, that have a potential to be resold (The collection will be further explained in Section 4.3.3). Additionally, if a device is donated at one of the second hand-stores of the wise, and it is non-functional it will be delivered here.

**Step 2:**
Items with a low likelihood of being resold, e.g. old computers are sorted out.

**Step 3:**
The items are then brought to the Repair Hub. The workers here test them and sort them with labels into three categories:

      A. Functioning and ready to use
      B. Repair necessary
      C. Repair not possible/viable

**Step 4:**
Simple repairs are conducted; complicated repairs or the exchange of electronic parts will not be conducted (or could only be done by people with an electronics background). For Example only standard parts, like fuses, sealing rings or connectors will be replaced. More intricate spare components will only be ordered if seemed viable for the resale.

**Step 5**:
If the repair fails on an item, the device is brought back into the recycling stream.

**Step 6:**
If the repair was successful, the respective items are transported to one of the stores of the reuse company or secondhand shop, ready to be resold.
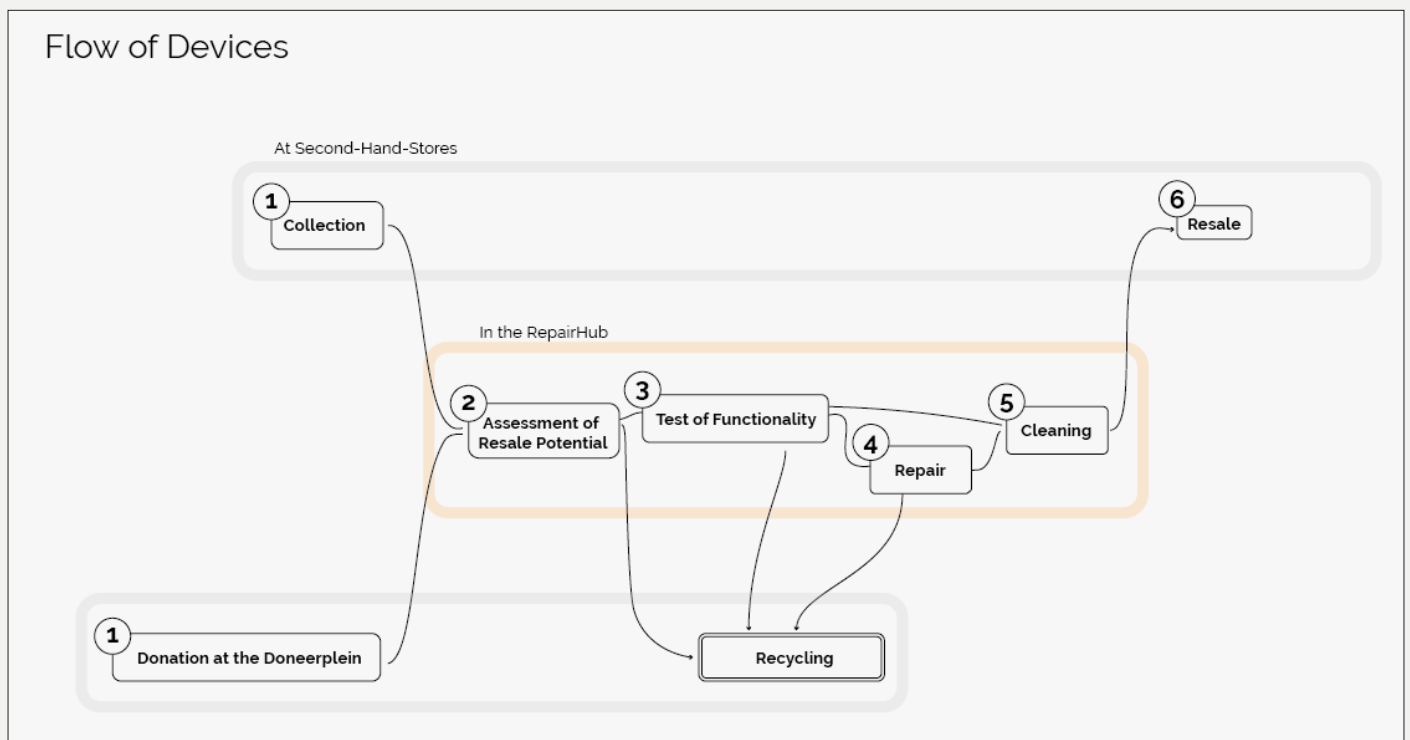


*Figure 19:  Flow of Device through the RepairHub*

*Figure 20 :  RepairEducation Workshop*

### 4.2.3    RepairEducation

A repair workshop can be offered to elementary schools as part of a visit to the Upcycle Mall. These workshops help to educate children about the value of repair to the environment, introduce them to the concept of a Repair Café, and teach repair skills that will make them more independent. The workshops will be conducted by Volunteers, active in the various Repair Cafés in Rotterdam.
The concept is based on the Repair Café Education concept developed by Repair Café Hamburg in collaboration with Network Reparaturinitiativen. It is conducted by volunteers with diverse skills in the Repair Hub. It focuses on students from third to sixth grade. The Level of depth and independence of the repair attempt can be adapted to the age group.

**Workshop Content:**
The Workshop concept was created to familiarize the children with general repair techniques. If possible, they should get the chance to repair or at least assess the repairability of a broken item that belongs to them. Some repairs are not practical due to the limited time of the workshop or organization. For this reason, Volunteers should prepare some exemplary objects to show the general repair process, for example a bike with worn out break blocks. The following list shows the general Skills: Students can be shown at each station, but this is to be adapted based on the items the students bring.

Electronics:
•        Safety
•        Diagnostics
•        Soldering a connection
•        Replacing a component

Textiles:
•        Fixing Buttons by hand
•        Mending a hole
•        Use of patches
•        Use of a sewing machine

Bicycles:
•        Changing, patching and pumping up a tube
•        Changing Break Blocks
•        Adjusting seat height
•        Cleaning and oiling a bike chain

Other (Ceramics, Plastic, Wood):
•        Using of different glues
•        Use of Patches

A list of materials and tools necessary for the Workshops is available in the appendix (Appendix 4). The tools can be shared with the RepairTogether-Activties.

**Workshop Process**
1.        The Volunteers prepare the four stations electronic repair, textile repair, others (ceramics, plastics, wood), Bicycles (outside), as seen in Figure 20.

2.        The students bring respective broken items from home. The volunteers have items available in case the student forgets to or cannot bring one.

3.	The class has an introductory session about waste, the value of repair and a Repair Café. Then, they are split into small groups of three to five students.

4.	At the repair stations, the volunteers repair together with the group the objects brought to them. Attention is paid to letting the children do tasks that fit their capabilities.

5.	In an ending session, the children explain in the group how they repaired the objects and what they have learned.

A full workflow showing all the steps to conduct a RepairEducation Workshop is shown in Figure 21. Since the proposed room for the RepairHub is limited in terms of space, two repair stations should be placed inside while two stations in addition can be put into the education rooms on the same level. These rooms need to be reserved by the Education Manager of the Upcycle Mall, who will also oversee assembling the necessary volunteers, by contacting the Repair Cafés. Furthermore, the Education Manager needs to contact and invite schools to the workshops as well as coordinate the schedule with them, as well as recruit the

volunteers via the Repair Cafés. The Volunteers will be payed a volunteer fee, which is a maximum of 5,50€ per hour and 210€ per monthlastingsdienst, n.d.. Funding for the function can be accessed for example via the subsidy for Nature and Environment Education of the Municipality of Rotterdam (Rotterdam.nl, n.d.). By asking for help of Repair Café Volunteers, the city can show their recognition, and openness to support to the Community Repair organizations, and create a space for exchange and networking. The Repair Café Volunteers can promote their causes and fulfill their wish to educate.

Netzwerk Reparaturinitiativen prepared educational material to conduct the workshops, that can be later adapted to the circumstances of the Workshop.

The Research has shown a clear need for the education of students to promote repair in Rotterdam. Offering Repair Workshops here furthermore helps fulfil one of the purposes of the Upcycle Mall, Education, and can be a platform to connect the different Repair Cafés in Rotterdam and involve them in the RepairHub.
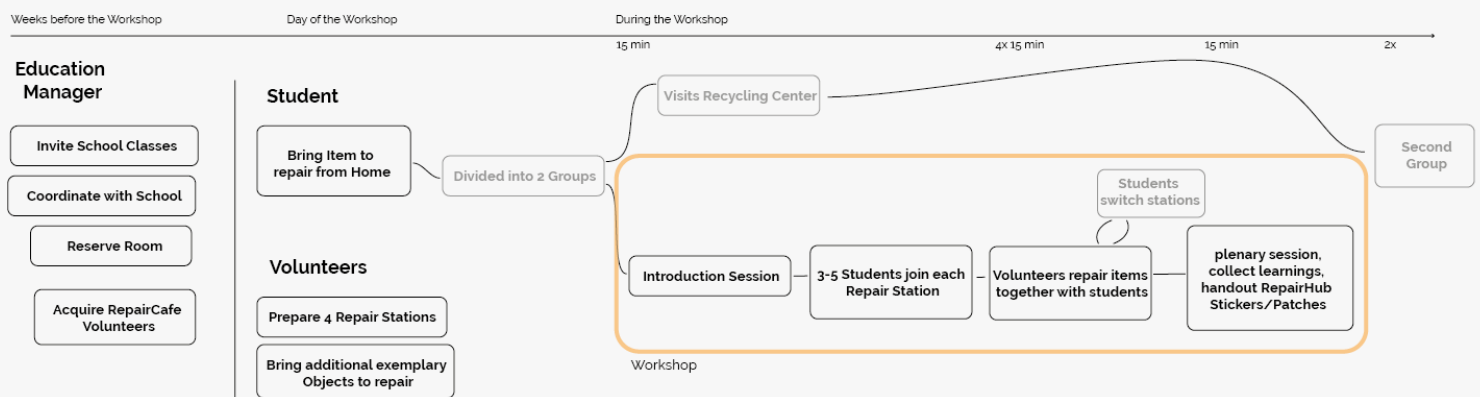


*Figure 21 :  RepairEducation Workshop Diagram*

### 4.2.4 Operations

This section explains the practicalities necessary for the RepairHub to operate.

**Schedule**
An exemplary schedule (Figure 19) was compiled to show the time distribution between the distinct functions of the RepairHub. The RepairEducation needs to happen during normal school hours during the week. The RepairTogether function is positioned on the weekend, when most citizens are expected, and they have a little more time to participate. Sort and Fix Center takes place on 4 days during the working week.

**Staff**
The RepairHub requires the involvement of several parties. Figure 22 displays the distinct roles.

*Education Manager:* Operates the RepairEducation function.

*Community Manager:* Coordinates the distinct functions at the RepairHub and acquire Volunteers for RepairTogether

*Recycling Center Workers:* Advises citizens on the donation of electronic devices at the Doneerplein

*Social Worker:* The Social Worker is the main person of contact with the WISE at the Upcycle Mall. The Social Worker oversees the Sort and Fix Center and the personal development, education, and progress of the workers here.

*People at distance from the labour market:* Conduct the sorting and repair of devices arriving at the RepairHub based on their own competences.

*Volunteers:* Conduct the RepairTogether function. At least two volunteers should be present each opening day.

**Room**
The physical location of the RepairHub is designed in a way to accommodate the variety of functions proposed and to the realistic size of the proposed room. Two large tables provide enough space for the sorting and testing of devices, but also to conduct RepairEducation Workshops. A counter serves as separation from the publicly accessible area for RepairTogether and a space for staff only. Here a computer is located to search for repair instructions on and schematics, either on the manufacturer's website, or on pages like iFixit or YouTube.
Additionally, one workspace is equipped with a desk lamp, testing equipment and a laboratory power supply for more concentrated repair operations. A shelf on the wall provides space to store devices waiting to be repaired. Under the counter space is available to store common spare parts, more tools and equipment necessary for maintenance.

**Business Model Canvas**
The Business Model Canvas (Figure 24) displays the logic behind the Business Model of the RepairHub in a structured system.

**Cost Structure**
An estimation of the costs in order to operate the RepairHub, is shown in Figure 23. It shows that a total of 67979€ is necessary to operate the RepairHub each year.
Part of the costs can be covered by subsidies. The RepairHub also creates higher value electronics that can be sold by the WISE. Assuming that each worker on average cleans and or repairs seven devices a day, and the average resale value is increased by 5 euros for each device, 35.700 Euros of resale value can created. This is roughly half of the funding lacking for the RepairHub.

## Examplary Schedule

| Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|---|---|---|---|---|---|---|
| Repair Education | Sort + Fix Center Electronica | Sort + Fix Center Electronica | Sort + Fix Center Electronica | Sort + Testcenter Electronica | Repair Together | Repair Together |
| 9.00-13.00 | 10.00-16.00 | 10.00-16.00 | 10.00-16.00 | 10.00-16.00 | 10.00-16.00 | 10.00-16.00 |

*Figure 21 :  Examplary Schedule of the RepairHub*

# Staff involved with the RepairHub

## Staff Upcycle Mall

**General Manager**
Overall Manager for the Operations of the Upcycle Mall

**Education Manager**
Education Activities at the Upcycle Mall

**Community Manager**
Main contact person for the different Users of the Upcycle Mall

## Staff Recycling Center

**Recycling Center Workers**
Operating the Recycling Center and Doneerplein

## Staff Social Enterprise

**Social Worker**
Supporting the development of the People at a distance form the Labour Market

**People at distance from the Labour Market**
Operating the Sorting and Testing Operation

**Volunteers**
Conducting the RepairTogether Function

**Repair Experts**

*Figure 22 : RepairHub Staff*

### Overview of Costs to Operate RepairHub

| Element | Quantity | Yearly Amount | Total Amount | Comment |
|---|---|---|---|---|
| Rent (incl. Utilities) | 1 | 9000 | 9.000,00 € | |
| Workers Sort & Fix Center | 6 | 20040*0.3 | 36.072,00 € | 70% of salary covered by Loonkostensubsidie |
| Social Worker | 1 | 30000*0 | 0,00 € | 100% of salary covered by UWV |
| Volunteers | 8 | 500 | 4.000,00 € | contribuition to expenses for RepairTogether Volunteers |
| *Overhead cost on personnel* | 1 | 10% | 3.907,00 € | |
| Training | 6 | 1000 | 10.000,00 € | Training on Repair and Maintenance of Devices |
| Tools | 1 | 2000 | 2.000,00 € | |
| Various | 1 | 3000 | 3.000,00 € | Cleaning Material, Consumables, etc |
| | | **Total Costs** | **67.979,00 €** | |

*Figure 23 : Overview of the estimated Costs*

## RepairHub Business Model Canvas

Municipality     WISE

### Key Partners
- Workers Integration Social Enterprises reselling Household Electronics
- Municpality
- Rotterdam Repair Cafes
- Schools

### Key Activities
- Consulting Rotterdammers on the Repair of their Items
- Conducting Repairs together with the visitors
- Sorting, cleaning and fixing Items to be resold
- Educating the youth on Repair and teaching them repair skills

### Key Ressources
- Skills
- Workers
- Volunteers
- A network of Repairers
- the Attention of Citizens
- Tools
- Donated Electronics

### Value Propositions

*RepairTogether*
- Convenience
- expending the life time of products
- Cost Reduction
- Reliability

*Sort and Fix Center*
- Preservation of materials
- higher quality of resellable electronic devices
- an educative work opportunity
- More circularrity

*RepairEducation*
- Education on Self-Repair Skills

### Customer Relationships
- Personal Assistance and Consultation
- Invitation to Schools to participate in RepairEducation through the Education Manager

### Channels
- Attention Billboards at the Upcycle Mall
- Web platform
- Flyer
- Education Manager
- The Secondhand Stores of the WISE

### Customer Segments
- Visitors of the Recycling Center
- Planned visitors
- Customers at the Secondhand shops
- Schools

### Cost Structure (Detailed in 4.3 Estimation of Costs)

**Fixed Costs**
- Rent for the Room at the Upcycle Mall
- Salaries for Repair Persons and Social Worker
- Utilities

**Variable Costs**
- Training on Repair for Repairers
- Costs for Tools, maintenance products and consumables
- Volunteer Payment for RepairEducation Workshops

### Revenue Streams
- Resale of Electronic Devices
- State Support for Workers
- Subsidie for environment education*

* e. g. Subsidie natuur- en milieueducatie https://www.rotterdam.nl/subsidie-natuur-en-milieueducatie-jaarlijks-aanvragen

*Figure 24 : RepairHub Business Model Canvas*

*Figure 25 :  Overview of the Signage system*

# 4.4  Signage System at the Upcycle Mall

The RepairTogether service is open focusing on two groups of clients: first, citizens planning repair a device and in the need of help and second, citizens visiting the recycling center with the intent to dispose of items. Since the RepairHub is in a building next to the proposed pathway of visitors through the Recycling Center, it bears the question how the visitors can be made aware of the services offered there during their visit. The visitors are given a variety of options, and they can choose depending on their own motivation, skills, and time limit. The first aim is to convince people to try to repair their broken Item, before they decide to dispose of it. If the visitor doesn´t have time that day but still a motivation to try to fix this or another device in the future, they are made aware of the option of visiting a Repair Café. If the visitor cannot be convinced of these options, they are suggested to donate their items for repair and resale at the Doneerplein. In case the item

is broken beyond repair or has an unlikely repair and resell success, such as electronic toothbrushes or consumer printers, the device is put in the brought by the citizen to the WEEE- Container.
This scheme (Figure 24) leads the citizen through a va

riety of options in a descending order of value for the circular economy, with repair and continued use (R4) as the most desired result. The individual Billboards are explained below. Their location is made clear in Figure 25.
The Signage System should help to make a visit to the Upcycle Mall a clear trigger to repair items, either directly in the RepairHub or later by visiting the Repair Cafés. It further preserves devices from being discarded as waste and makes it possible to recover value from devices directed to the waste container.
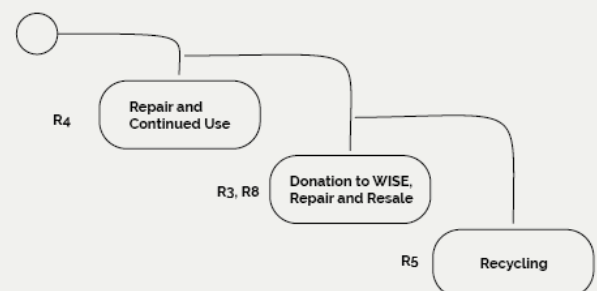


*Figure 24 :  Circular Options at the RepairHub*

Figure 26

**Attention Billboard**
*First Billboard to make Citizens aware of the RepairTogether offering at the Upcycle Mall*

**Map Billboard**
*Second billboard showing the way to the RepairHub and the location of the different Community Repair Organization in Rotterdam*



Figure 27

**Doneerplein Billboard**
*One Billboard serves a a last Reminder of the Repair Service, one presents a guide for donating dfor reuse*



Figure 28

### 4.4.1 Attention Billboard (4)

The Attention Billboard (Figure 29) is the first sign, placed at the two entrances of the Compound. It is designed to capture the visitor's attention to the option to repair at the Upcycle Mall and make the visitor intrigued to find out more on the Map Billboard. This Billboard also shows one key visual element, combining the billboards, the green hand. This element should function both as a logo, displaying the hands on repair aspect of the RepairHub and also work as a guidance sign, pointing towards the Upcycle Mall.



*Figure 29 Attention Billboard*

### 4.4.1 Map Billboard (5)

The Map-Billboard (Figure 30) is placed at the Doneerplein of the Upcycle Mall. It serves two main purposes, first to display a map of all the locations of Community Repair organizations in Rotterdam and to make visitors aware of them. The information for the map was collected in the during the research on the repair provision in Rotterdam.  Secondly to show the opportunity to repair one's electronic devices right there at the Upcycle Mall. The Billboard is supposed to grab the attention of people visiting the recycling center and motivate them to use the repair service at the Upcycle Mall or at one of the neighborhood Repair Cafés. This is made clear through the descriptions REPAIR HERE & NOW (at the Upcycle Mall) and REPAIR IN YOUR NEIGHBORHOOD (at one of the Community Repair Organizations). To allow the visitor to access the map later, the billboard also displays a QR-Code that leads to the online version of it and has a weather-protected container for printed physical maps of these organizations. The tags for location and timing are glued on as stickers, making it possible to easily adapt the billboard if location or opening times change (Figure 31) The right side displays the opening times of the RepairHub at the Upcycle Mall, an activating description, and some illustrations of the Service.

The Upcycle Mall billboard fulfills two essential purposes: it serves as a beacon and trigger for repair, raising awareness about Community Repair organizations in Rotterdam by providing a centralized source with clear information on locations and opening times. Secondly, it highlights the immediate option to fix electronic devices at the Upcycle Mall's RepairHub. This combination not only spreads awareness about Community Repair but also promotes both the immediate repair provision at the Upcycle Mall and local repair provisions in Rotterdam's Neighborhoods. This billboard targets people unaware of the repair services.
The billboard makes it possible to address the following identified challenges identified in the Context research:

Information Gap: It is an observation that there is a need for more centralized information about Community Repair organizations in Rotterdam, making it challenging for individuals to discover their locations and opening times. The Billboard addresses this information gap by providing a tangible and visible map, making these repair services easily accessible.

• Visibility Challenge: Community Repair organizations, especially those outside the network of the community centers, need help to attract new visitors. Despite a positive perception of Repair Cafés, potential attendees are often unaware of their existence, even when residing nearby. Placing the Billboard at the recycling center and Upcycle Mall, frequented by diverse groups with an existing interest in waste and materials, is a strategic move to introduce these organizations to new and varied audiences, thereby boosting community engagement.

• Timing and Convenience: Visitors to the recycling center may not always plan to seek repair services immediately. The Billboard recognizes this behavior by offering a „Repair in your Neighborhood" option, acknowledging that people might not be ready for immediate repairs but providing information on local Community Repair organizations for future consideration. This caters to individuals who may return later or explore repair services in their neighborhood at their convenience.

A large scale version of the Billboard can be found in the Appendix.

*Figure 30 Map-Billboard*



*Figure 31 Map-Billboard*

### 4.4.3 Billboards at the Doneerplein (6)

At the Doneerplein (Figure 32), the visitor is made aware one last time of the option to repair in the RepairHub via a Billboard (Figure 34, right side).

Even if visitors finally decide to dispose of items, being now aware of the RepairHub, it might convince them for a visit to the RepairHub and make a repair attempt, either at their next visit or the next time they have a defective item. At the Doneerplein, items that are good for resale are placed at on one of the carts, that can later be pushed to the RepairHub for further sorting. A second Billboard (Figure 33, left side) provides a guideline for the items accepted. In general, the visitor is made aware to donate items they would not be ashamed to donate to a neighbor. Furthermore, if an item is not working, the citizen should indicate what is not working about it on a sticker and put it on the device. This facilitates the testing and sorting later at the RepairHub. The Doneerplein is staffed by at least one Recycling center worker, who can consult the visitors if necessary and make sure that only devices in need are taken on to evade an overprovision. Figure 30 displays the electronic donation site on the Doneerplein.



*Figure 32 Overview of the Doneerplein*



Sticker to facilitate Sorting

**Help us to save this device, by letting us know what is broken**

RepairHub
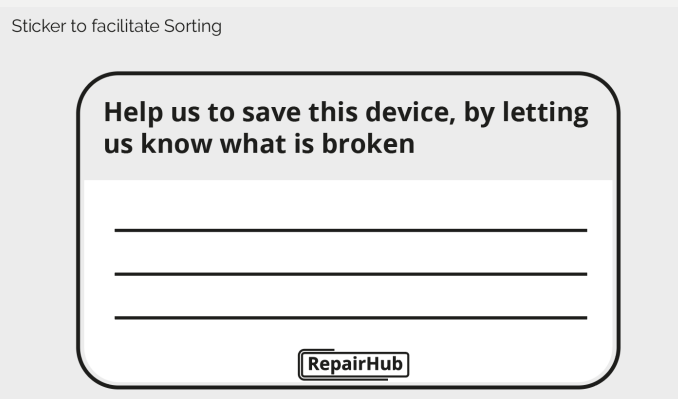
*Figure 33 Overview of the Doneerplein*



Donate your devices to give t
a second life

In the RepairHub we will sort, clean and repair them if possible. The
later found at Secondhand Shops throughout Rotterdam

As a general guideline:
Donate items you wouldn't feel ashamed
gift to your neighbour.

Do you know what is
the device? Help us t
by letting us know or

Not sure if the item is can be
saved? We are here to help!
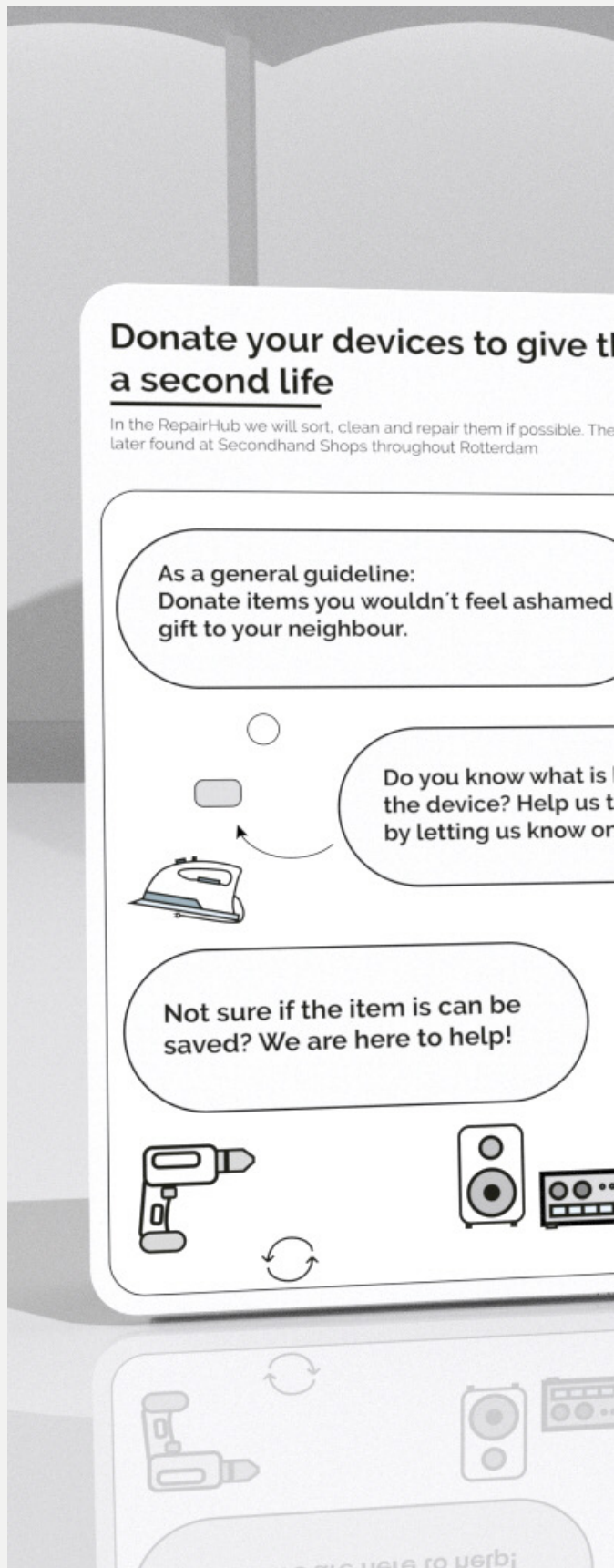
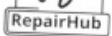*Figure 33 Billboards at the Doneerplein*

Are you sure you and your device want to part?

Can it still be fixed?

Get free and fast advice and repair it together with Experts in the RepairHub.

RepairHub

No time today?

Bring it to a Repair Cafe in your Neighborhood!

# 4.5 Awareness for Community Repair in Rotterdam

The map of Community Repair organizations on the Map-Billboard (5) would be limited in effectiveness if the only options to inspect them were at the municipal recycling centers. The following two parts of the concept are making the citizens aware of the functions and opening times of the RepairHub and other Community Repair Organizations in Rotterdam.

### 4.5.1 Website

A website will display the different Community Repair organizations in Rotterdam and provide pictures and a brief explanation for each of them. A calendar will be displayed to be a reliable source of opening times in Rotterdam, as well as show alternatives fitting a citizen's preferred date of use. A brief explanation of each Repair Café provides information on the different identities and services provided. This shows the variety of the different Community Repair Organizations in Rotterdam and avoids confusion or frustration due to unmet expectations. Additionally, links to the own communication channels of the repair café are provide here.

The web platform exists to display basic information as a start. Additional features such as video calls with repair café volunteers as a fast option for advice and an

appointment making system can be integrated in the future. For both applications to integrate into websites were developed by ShaRepair. The video call feature allows citizens to have a consultation with a Volunteer about repairing a device, without the need to travel to the RepairHub.  A QR Code on the previously mentioned Billboard will link to the website. To increase the likelihood of it being found via a google search, it should be hosted as a subsite of the existing Rotterdam Circulair website. This increases the amount of content on the overall website, usually leading to a higher ranking on search engines.
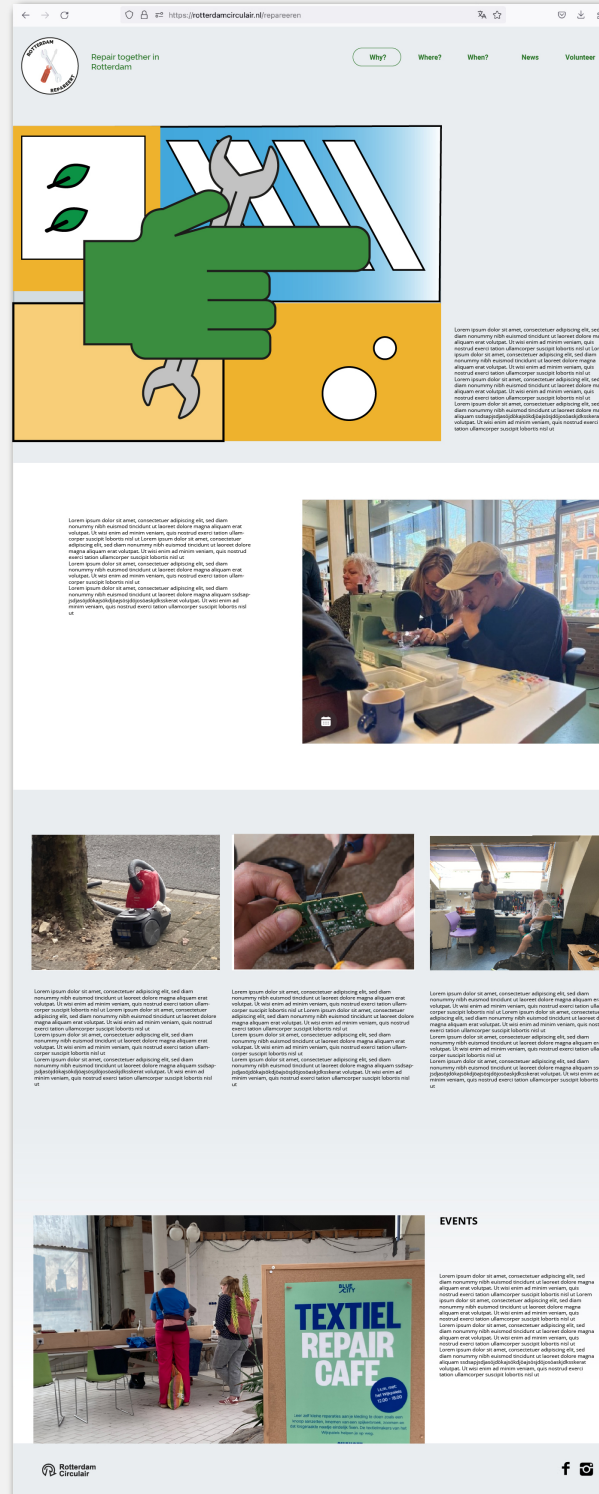
**Rotterdam Repair Website Mockup**



*Figure 34 Mockups for a Repair Website*

## Repair Together in Rotterdam

### Community Repair

Your old CD-Player doesn't work? There is a hole in your favourite jumper? Don't despair and fix it:

Repair Cafés are free meeting places and they're all about repairing things (together). In the place where a Repair Café is located, you'll find tools and materials to help you make any repairs you need.

On clothes, furniture, electrical devices, bicycles, crockery, appliances, toys, et cetera. You'll also find expert volunteers, with repair skills in all kinds of fields. Visitors bring their broken items from home. Together with the volunteers they start making their repairs in the Repair Café. It's an ongoing learning process.

There are over 20 places for Community Repair in Rotterdam. Take a map, so you know where they are and visit one in your Neighborhood to fix one of your beloved items.

### Benefits

Repairing your goods has multiple benefits, not just for society but also for you personally:

**You are saving money:** Overall repairing is cheaper then buying a new object. Especially with the free help of the volunteers

**You are saving a beloved object:** That old sweater you once bought with your mom, the camera you have since childhood. Sometimes things can break but keep them and the memory alive by repairing them

**You are learning a new skill with fun people:** Repairing together allows you to learn more about creative ways to bring objects back to live. It's often easier then you think and volunteers are happy to lead the way for you.

**It's good for the Environment:** By repairing you are not only limitizing the creation of potentially hazardous waste, but alspreserving precious resources and habitiats all over the world

MORE INFORMATION →

### How it works?

Community Repair Events and repair cafes are organized by Citizens. The people involved are volunteers and are happy to spend their free time assisting you with the repairs.

Are you a Handy-Harry yourself and like to be part of a community of makers helping their neighborhood? Jus visit a repair cafe and ask them to joi. They'll gladly give you more information.

Listed below Repair Cafes in rotterdam as on the map on the other side of this leaflet

Listed below Repair Cafes in Rotterdam as on the map on the other side of this leaflet

**1** **Repair Cafe Schiebroek**
Third Wednesday of the Month 9.30-11.15
Larikslaan 200, 3053LG Rotterdam

**2** **Repair Cafe De Esch**
Tuesday, Wednesday, Thursday 13.00-16.00
Rijnwaterstraat 23, 3063HC Rotterdam

**3** **Repair Cafe Het Mooite Waard**
Saturday, 10.00-12.30
Claes de Vrieselaan 72, 3021JS Rotterdam

**4** **Repair Cafe Thuis in West**
1st and 3rd Wednesday of the Month 10.00-13.00
Robert Fruinstraat 28, 3021XE Rotterdam

**5** **Repair Cafe West**
1st and 3rd Saturday of the Month, 13.00-17.00
Gaffelstraat 61B, 3014RC Rotterdam

**6** **Doe-het-Zelf Werkplaats**
Tuesday, 18.00-20.00
Schout Heynric-Straat, 3032SX

## Map of Community Repair



**7** **Repair Cafe Zevenkamp**
Monday 14.00-16.00
Ambachtsplein 141, 3030XA Rotterdam

**8** **Repair Cafe Het Lage Land**
Wednesday 14.00-16.00
Duikerstraat 29 3067TK Rotterdam

**9** **Repair Cafe Noord**
Second Sunday of the Month, 10.00-12.00
Noordplein 12, 3032XL Rotterdam

**10** **Repair Cafe Charlois**
Last Wednesday of the Month 18.00-21.00
Slinge 250, 3085EX Rotterdam

**11** **Miks Fix Service**
Mondays 10.00-12.00
Cypruslaan 406, 3059XA Rotterdam

**12** **Repair Cafe Halte**
Wednesdays 14.00-16.00
Hoge Schiefof 39, 3042AZ Rotterdam

**13** **Repair Cafe Hoogvliet**
Last Saturday of the Month, 9.00-12.00
Mosoelstrat 20, 3193EL Hoogvliet

**14** **Repair Cafe Rozenburg**
Tuesday 13.00-14.00
Lekstraat 2, 3193EL Rozenburg

**15** **Repair Cafe Hoek van Holland**
Tuesday, Wednesday 11.00-16.00
Badweg 67, 3151HA Hoek van Holland

**RepairHub at the HER**
Saturday and Sunday 9.00-17.00
Bovendijk 121, 3017OP

*Figure 34 Flyer Showing the Maps of Community Repair*

### 4.5.1 Take-Away-Map

For digitally disadvantaged people and as a physical reminder of the billboard, a Z-Fold Flyer will be handed out at the Billboard. It contains Information on Location and opening times. As well as information on the reasons for repairing it and the concept of Repair Café.

*Figure 35*

# 4.5.1 User Journeys

To display how the proposed concepts provide a mix of services to various clients, I created personas. based on the interviews conducted and supplemented with additional Literature and information from the field visits.

For the different personas, I created three User Journeys that highlight the different routes they can encounter with the different concepts presented. The user journeys were created to illustrate the desired Function and Impact of the RepairHub. (Figures 34, 35, 36)



User Journey 1

Sarah, 46

Parent, working in Communications

Only wants to drop off items, since her children leave very little time

Motivated by: Environmental Concerns, Convenience

Sarah clears out his basement and has plenty of things to bring to the Milieus-traat

Upon
Repa

A few days later...

At home she checks the website to see which cafe is open the next.

RepairHub

The workers and Volunteers at the RepairHub bring the electronics from the Doneerplein into the Repair-Hub

*Figure 34 User Journey Sarah*

arrival he sees a the large
air Billboard.

Today she is running out of time. But she sees there is a repair cafe closeby hes house. She takes a map.

She drops off some still usable electronics at the doneer plein.

REPAIR CAFE

Can repair an item when she has time

Found a place for help in the neighbor-hood

Hands in devices for the second hand shops

Sarah brings her stockpiled broken mixer to the Repair Cafe in her neigh-borhood where they repair it success-fuly

After this first experience, Sarah will attend the cafe in the future, when something is broken

Here the Objects are sorted and made fit for resale in he ReUse Stores in Rotterdam. The RepairMonitor can elp assessing the likelyhood of successful repair.

The Devices are distributed to different stores throug-hout Rotterdam

Here the Objects are sorted and made fit for resale in the ReUse Stores in Rotterdam. The RepairMonitor can help assessing the likelyhood of successful repair.

## User Journey 2

**Anissa, 24**

Psychology Student

Affraid of being belittled for having limited skills and knowledge for fixing electronics

Motivated by:
Environmental Concern, little money
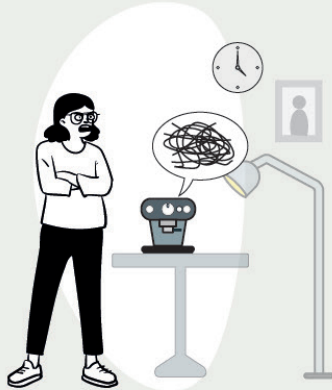
Her Coffee Machine Breaks, so but the warranty has expired.

She expects the repair to be expensive and never bothers to analyse the defect. Upon arrival he sees a the large Repair Billboard.

She follows the s... pairHub

RepairHub

Together they repair the Machine

After they s... they put a s...

## User Journey 3

**Henrik, 16**

Vmbo Student Product and Dienstverlening

His console controler broke and he doesn't have the money for a new one

Motivated by:
Little financial ressources, fun

Henriks Controller is broken
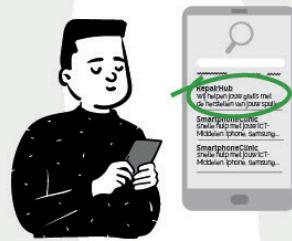
He searches on the internet „Repair+Rotterdam"

Since cost is... go's to the R... repair it toge...

*Figure 34 User Journeys Anissa & Henrik*

RepairHub

...signs to the Re-

A Repair Expert opens the machine with her. A the hose is broken. But luckily they have the spare part.
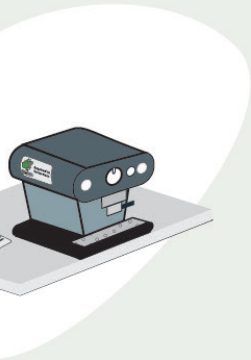
...successfully repair it ...sticker on the machine

Saved Money

Learning new Skills and being proud of the outcome

Learning of the offe- rings of the neighbor hood

After this first experience, Anissa will attend the Re- pairhub in the future, when something is broken or go to a Repair Cafe in her neighborhood

RepairHub

Learning a new skill

Being able to play again
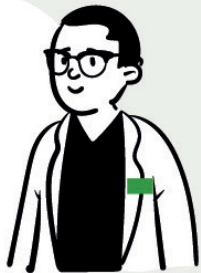
Finding a new hobby

...his main motivator he ...epairHub and trys to ...ether with an experts

He enjoys it and comes back as a volunteer

# Value Map



**WISE**

**Workers with disadvantages**

**Volunteers**

**Community Repair Organisations**

Rent €

Higher quality of second hand electronics

Workforce

Training of skills in demand

Self Efficacy
Fun

Knowledge and practical work

Support to attract Visitors & Volunteers

Work and knowledge

Recognition by the municipality

A Volunteer Compensation

A place to network with other CROs

Providing a Location

Sharing tools and Space

Attention for Service

SORTING AND TESTING FOR REUSE

REPAIR TOGETHER

BILLBOARD

REPAIR WEBSITE

FLYER

REPAIR EDUCATION

promoting a repair culture

additional foot traffic for the Upcycle Mall

Support to find Volunteers

Saving an Object
Reliable and free repair option
Educative Repair
Saving Money

Reliable and easy to find Information

Re-Skilling for the Future

Promoting Self-repair

M...

Rot...

Creating Loca...

*Figure 35 Value Map*

## 4.7  Value Map

The value map (Figure 38) sets the distinct functions of the RepairHub and stakeholders involved in relation. It communicates which needs and values are fulfilled by each of the proposed concepts. It furthermore shows the interplay between the different concepts.

## 4.8  Conclusion Design Proposal

The Design Proposal displays a broad variety of Concepts that can systematically contribute to promote both Repair Awareness as well as Repair Ability in Rotterdam. The proposed concept is designed to advance the culture of repair in Rotterdam, use the unique context of the Upcycle Mall, and provide a range of values to the stakeholders involved.

# 5. Finalization

# 5.1  Validation

With this vision for a RepairHub at the Upcycle Mall set in the form of a design proposal, it is necessary to prove the validity of the design. By involving project stakeholders, the desirability, feasibility, and effectiveness can be tested, and insight into the barriers the stakeholders see in the offered proposal can be gained. Additionally, it presents a last round of feedback to make adjustments to improve the design proposal. Because of the eight solutions presented and the stakeholders involved, it was decided to hold several validation sessions to test different aspects of the design. The Stakeholders chosen for the validation were:
The Municipality as the client of the project
Consumers, to test the attractiveness and understanding of the RepairTogether Activity, the Signage System, the Website and Flyer
Repair Cafe Volunteers to test their desirability, barriers, and drivers for their involvement.

## 5.1.1 Municipality

The validation session for the Municipality was set up as a presentation of the research insights and an Overview of the design proposal. The results were openly discussed, and short feedback was provided individually by the participants via PostIt notes. Seven employees of the Municipality and Rotterdam Circulair, including the Upcycle Mall Project Team, were involved.
The first general impressions were overall positive. The mix of activities in the same space was well received as it makes the overall concept viable, adds more diversity to the UM offering, and invites citizens to visit it. The RepairEducation activity was seen as feasible and fit the goals of the Upcycle Mall.

The involvement of Community Repair Organizations was seen as valuable. Further, supporting them in their actions was seen as highly important in rekindling a Repair culture. The Billboard showing the various Repair Cafes was seen as beneficial for citizens interested in or needing Repair. Clearly, the information must also be available in other places in the city. It was suggested that the QR Code leading to the website be displayed in other suitable locations in the city and communicated through the Rotterdam Circulair channels.
It was questioned whether Billboard and the involvement in RepairEducation are enough to start the networking between Repair Cafes.
One of the barriers to the proposal was the reliance on volunteers for the RepairTogether Activity, as a lack of volunteers is a known problem at other Repair Cafes in the city. The participants, therefore, asked for ideas for incentives for volunteers. The participants proposed one incentive: an annual dinner for the different community repair organisations organized by the Municipality. This could also be a moment for discussion and an exchange of ideas between the other organizations.

The main point of discussion was whether there were enough human resources within Rotterdam Circulair to realize the project proposal at the Upcycle Mall. It was noted that no one within the organization currently facilitates Repair in the city; however, it touches the fields of action of several employees.

## 5.1.2 Potential Users

Subsequently, parts of the concept were tested with potential users. In three individual sessions, the citizens were presented with the signage system, the RepairTogether Concept, the Flyer, and the Website. This led to final iterations for the visual design and copy text and insights presented below.

### Signage System &: RepairTogether:
The interviewees reacted positively to the signage system. They understood the purpose of the signs and felt that it urged them to repair their items. All three of them were impressed by how conveniently the board text framed Repair and were intrigued if the RepairTogether Offer could hold up to that promise. One interviewee noted, "It is essential to me that I can try to repair the item there right away. If I don't do it there, I will never do it,. Another respondent would like to be made aware of the Repair Cafes in their Neighborhood: "It really depends on how much time I have that day, but remember the last time I was at a recycling centre, I tried to leave as soon as possible. I would take the flyer with me and visit a Repair Café when I have time."

### Website/ Flyer
The consumers mentioned that the Website and Map would allow them to visit Repair cafes depending on their schedule. They preferred travelling longer distances to a Repair Café that is open when they have time, compared to waiting for the one closest to them to open the next time. One interviewee pointed out that the opportunity for Repair Cafes to present themselves is beneficial for him in knowing what to expect from a visit and would mitigate possible confusion about the organization. He was also wondering if the Municipality, by putting them on a website, somehow vouchs for the Repair Cafes being open and providing a kind of service quality.

### 5.1.2 Community Repair Organizations
The identified barriers to community repair organization from my research and the proposed concepts were discussed with one Organizer of a Repair Café.
The benefits of building a network were discussed, especially those related to sharing resources, overcoming common difficulties, attracting volunteers, and facilitating communication among Rotterdam citizens. The Organizer was enthusiastic about the Idea of the website and the flyer. He responded initially: "This makes me want to visit them all on a little tour. He sees a benefit in it, mainly for the visitors of Repair Cafes, by presenting them with more options. The individual Repair Cafes can promote each other, for example, for special Repairs or if they run out of time during an event. Additionally, by being placed on one map,

the Interviewee was certain that more collaboration between the Community Repair Organizations would occur.

The organizer stated the importance of clearly communicating that they are volunteer-run organizations independent of the municipality and was worried about appropriation by the city. Community repair organizations come to life through the efforts of many volunteers and should not be presented as a service to the town. Still, recognition by the city would be very welcome through continued support, for example, with a direct spokesperson to help with a funding application, the search for volunteers, and communication with citizens. Also, the Idea of an award for incredibly involved volunteers or initiatives came up; additionally, the Idea of a master class was discussed, and professional training for repair café volunteers on the Repair of items was provided. This would enable them to repair Items faster and with a higher success rate.

# 5. 2 Conclusion

During the research for this thesis, I encountered that municipalities' space of action to change the downfall of Repair is limited. Systemic Changes in the production of goods and product design are necessary, and they would need to be warranted by national and EU-wide regulations.
The actions the Municipality can take in the special circumstances of the Upcycle Mall are even more limited, especially because making a viable business case for repairing small electronic devices is difficult.

The proposed concepts would lower the barrier to repairing broken items when visiting the Recycling centre and in Rotterdam in general.
Overall, it makes repair more convenient than without the proposed concepts. Still, compared to ordering a new item, it takes more time and is burdened by the uncertainty of whether the repair will be successful. This means the solution needs a certain amount of interest and motivation in saving money, conserving the environment and  manual work by the citizens, and this is not prevalent at everyone.

As the proposed concepts for the RepairHub can not be operated by the municipality, the realization of the concepts depends on finding a partner, a social enterprise involved in work integration and the reuse economy, as well as their willingness to invest in the development of the Hub. This presents a major barrier, and can only be tested in discussions with these companies.
Additionally the right volunteers must be found for conducting repairs for RepairTogether Function. The network of the a social enterprise will be beneficial for that search.

The RepairHub concept would be a unique opportunity to address citizens on the importance and benefits of repair practices.

# 5.3  Recommendations

As a final outcome of this research I propose a few recommendations to the municipality.

**Raising Awareness of Repair:**
The municipality can continue their efforts to raise awareness for repair as an option to replacement, highlighting the benefits of saving costs, doing something good for the environment and the fun it could entail. The idea of the Repair Café especially needs to be introduced to the citizens since, in my interviews, a lot of misconceptions about what they are were perceived.

**Community Repair Organizations;**
Unique in Rotterdam is the situation that Repair Cafes are small in size, with few volunteers each, in comparison to larger unified Organizations in other cities. This limits them in the actions they can fulfill, however often they provide a higher community aspect for the individuals. To support them and facilitate exchange between the organisations, creating a network can be supported by the interventions presented in this thesis. Providing a balance between individual support , network support and independence and individuality is key for the success, aswell as recognizing the efforts of these volunteer organizations.
In the appendix a list is supplied of all the 16 Community Repair organisations found in my research.

**RepairHub:**
The proposed RepairHub at the Upcycle Mall, presents a vision of what could be possible, but would need to be further developed with the involvement of a ReUse Social Enterprise. Parts of it , such as the Billboard

linking to Repair Cafes or RepairEducation can, with adaptions, also take place if no suitable social enterprise is found

**Education:**
Educating young people on repair, and teaching them necessary skills, is a very effective option of promoting repair and entails other benefits, such as teaching about waste and responsible consumption. Several Guides are available, that could be implemented or adapted for the future. To include such an lesson in an event, such as the E-waste Race or Textile Race could support both concepts.

**Website:**
The website would present a possibility to spread reliable information on the different repair options in Rotterdam. Professional Repairers, as far as available could also be included. To provide a level of reliability, the information should be checked once a year to take the changing schedules and locations of Repair Cafes into account.

**Flyer**
Also the flyer needs to be updated on a regular basis, to ensure the reliability of information and prevent frustration. It can be handed out at the Wijkhubs, the Huizes van de Wijk, Repair Cafes and local Recycling centers.

By implementing this concept or parts of it, the municipality can take first steps in promoting consumer repair in Rotterdam.

The End

# 6. References:

Bizer, K., Fredriksen, K., Proeger, T., & Schade, F. (2019). Handwerk und Reparatur – ökonomische Bedeutung und Kooperationsmöglichkeiten mit Reparaturinitiativen.

Bos-de Vos, M. (2020, September 10). A framework for designing for divergent values. https://doi.org/10.21606/drs.2020.374

Brusselaers, J., Bracquene, E., Peeters, J., & Dams, Y. (2020). Economic consequences of consumer repair strategies for electrical household devices. Journal of Enterprise Information Management, 33(4), 747–767. https://doi.org/10.1108/JEIM-12-2018-0283/FULL/XML

Diddi, S., & Yan, R. N. (2019). Consumer perceptions related to clothing repair and community mending events: A circular economy perspective. Sustainability (Switzerland), 11(19). https://doi.org/10.3390/SU11195306

Dobson, C. (2007). The Citizens Handbook: A guide to Building Community

EU agrees new law granting consumers a 'right to repair' products – Euractiv. (n.d.). Retrieved February 9, 2024, from https://www.euractiv.com/section/energy-environment/news/eu-agrees-new-law-granting-consumers-a-right-to-repair-products/

European Commission. (n.d.). Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on common rules promoting the repair of goods and amending Regulation (EU) 2017/2394, Directives (EU) 2019/771 and (EU) 2020/1828.

European Commission. (2018a). Behavioural study on consumers engagement in the circular-. https://doi.org/10.2818/921596

European Commission. (2018b). Behavioural study on consumers' engagement in the circular economy : executive summary. Publications Office of the European Union. https://doi.org/10.2818/921596

Fachbach, I., Lechner, G., & Reimann, M. (2022a). Drivers of the consumers' intention to use repair services, repair networks and to self-repair. Journal of Cleaner Production, 346. https://doi.org/10.1016/J.JCLEPRO.2022.130969

Fachbach, I., Lechner, G., & Reimann, M. (2022b). Drivers of the consumers' intention to use repair services, repair networks and to self-repair. Journal of Cleaner Production, 346, 130969. https://doi.org/10.1016/J.JCLEPRO.2022.130969

Fogg, B. (2009). A Behavior Model for Persuasive Design. Proceedings of the 4th International Conference on Persuasive Technology, 279.

Forti, V., Baldé, C. P., Kuehr, R., & Bel, G. (2020). The Global E-waste Monitor 2020

Gobert, J., Allais, R., & Deroubaix, J. F. (2021). Repair and reuse: Misalignments between stakeholders and possible users. Journal of Cleaner Production, 317, 128454. https://doi.org/10.1016/J.JCLEPRO.2021.128454

Godfrey, D. M., Price, L. L., & Lusch, R. F. (2022). Repair, Consumption, and Sustainability: Fixing Fragile Objects and Maintaining Consumer Practices. Journal of Consumer Research, 49(2), 229–251. https://doi.org/10.1093/JCR/UCAB067

Huang, J., Esmaeilian, B., & Behdad, S. (2016, August 21). Design for Ease-of-Repair: Insights From Consumers' Repair Experiences. Volume 4: 21st Design for Manufacturing and the Life Cycle Conference; 10th International Conference on Micro- and Nanosystems. https://doi.org/10.1115/DETC2016-59685

Jaeger-Erben, M., Frick, V., & Hipp, T. (2021). Why do users (not) repair their devices? A study of the predictors of repair practices. Journal of Cleaner Production, 286, 125382. https://doi.org/10.1016/J.JCLEPRO.2020.125382

Jin, C., Yang, L., & Zhu, C. (2023). Right to Repair: Pricing, Welfare, and Environmental Implications. Management Science, 69(2), 1017–1036. https://doi.org/10.1287/MNSC.2022.4401

Korsunova, A., Heiskanen, E., & Vainio, A. (2023). Consumer decision-making on repair in a circular economy: A process model based on experiences among young adults and stakeholders in Finland. Journal of Cleaner Production, 405. https://doi.org/10.1016/j.jclepro.2023.137052

Laitala, K. (2014). Consumers' clothing disposal behaviour – a synthesis of research results. International Journal of Consumer Studies, 38(5), 444–457. https://doi.org/10.1111/IJCS.12088

Lechner, G., Wagner, M. J., Diaz Tena, A., Fleck, C., & Reimann, M. (2021). Exploring a regional repair network with a public funding scheme for customer repairs: The 'GRAZ repariert'-case. Journal of Cleaner

Production, 288, 125588. https://doi.org/10.1016/J.JCLEPRO.2020.125588

Magnier, L., & Mugge, R. (2022). Replaced too soon? An exploration of Western European consumers' replacement of electronic products. Resources, Conservation and Recycling. 185. https://doi.org/10.1016/j.resconrec.2022.106448

Manoochehri, M., Schluep, M., Dams Y, Mehlhart, G., Bekkevold Lingås, D., Marin, G., Nicolau, M., & Colgan, S. (2022). An overview of Europe's repair sector. https://www.eionet.europa.eu/etcs/etc-ce/products/etc-ce-products/etc-ce-report-6-2022-an-overview-of-europes-repair-sector

Mclaren, A., & Mclauchlan, S. ; (2015). Crafting sustainable repairs: practice-base approaches to extending the life of clothes. 17.

Moalem, R. M., & Mosgaard, M. A. (2021). A critical review of the role of repair cafés in a sustainable circular transition. Sustainability (Switzerland), 13(22). https://doi.org/10.3390/SU132212351

Möbius. (2020). Survey of the repair sector for small household electrical appliances.

Nazlı, T. (2021). Repair motivation and barriers model: Investigating user perspectives related to product repair towards a circular economy. Journal of Cleaner Production, 289, 125644. https://doi.org/10.1016/J.JCLEPRO.2020.125644

Paulhus, D. L. (1984). Two-component models of socially desirable responding. Journal of Personality and Social Psychology, 46(3), 598–609. https://doi.org/10.1037/0022-3514.46.3.598

Right to Repair Europe. (2023, March 9). There is life on Mars! Success stories of financial incentives to make repair affordable -. https://repair.eu/news/there-is-life-on-mars-financial-incentives-to-make-repair-affordable/

Rogers, H. A., Deutz, P., & Ramos, T. B. (2021). Repairing the circular economy: Public perception and participant profile of the repair economy in Hull, UK. Resources, Conservation and Recycling, 168. https://doi.org/10.1016/J.RESCONREC.2021.105447

Rotterdam.nl. (n.d.). Subsidie natuur- en milieueducatie. Retrieved February 11, 2024, from https://www.rotterdam.nl/subsidie-natuur-en-milieueducatie-jaarlijks-aanvragen

Scott, K. A., & Weaver, S. T. (2014). To Repair or Not to Repair: What is the Motivation? (Vol. 26). http://www.jrconsumers.com/Academic_Articles/issue_26/

Sharepair. (n.d.). How to become a repair city? | Sharepair. Retrieved May 22, 2023, from https://www.sharepair.org/repair-network-for-cities

Sharepair. (2021). Urban Repair Centres - Overview of best practices (URC). https://www.sharepair.org/repair-network-for-cities/urban-repair-centres

Sharepair. (2022). Feasibility Study for Urban Repair Centres. https://www.sharepair.org/files/Feasibility-study-for-URC-Report.pdf

Svensson-Hoglund, S., Richter, J. L., Maitre-Ekern, E., Russell, J. D., Pihlajarinne, T., & Dalhammar, C. (2021). Barriers, enablers and market governance: A review of the policy landscape for repair of consumer electronics in the EU and the U.S. Journal of Cleaner Production, 288. https://doi.org/10.1016/J.JCLEPRO.2020.125488

Svensson-Hoglund, S., Russell, J. D., & Richter, J. L. (2022). A Process Approach to Product Repair from the Perspective of the Individual. Circular Economy and Sustainability 2022, 1–33. https://doi.org/10.1007/S43615-022-00226-1

Vrijwilligersvergoedingen. (n.d.). Retrieved February 12, 2024, from https://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/prive/werk_en_inkomen/werken/werken-als-vrijwilliger/vrijwilligersvergoedingen/

WRAP. (2011). Realising the Reuse Value of Household WEEE. available at: http://www.wrap.org.uk/sites/files/wrap/WRAP%20WEEE%20HWRC%20summary%20report.pdf, Retrived 05.03.2024

# 7. Appendix

**Florian Henschel**

# Interview Guide
## with Citizens of Rotterdam
**Barriers and Drivers of Repair**

## 1. Explanation of Research

Explain thesis context , Ask for Consent to Record (Form)

## 2. Warmup Questions

| *Question* | *Purpose* |
|---|---|
| **Can you tell me a little bit about yourself?** | Establish rapport and make the interviewee feel comfortable. |
| **Do you currently have a broken item that needs to be repaired? For how long have they been broken?** | Personal urge to repair |

## 3. Main Questions

| *Question* | *Phases* | *Topics to Dive Deeper* |
|---|---|---|
| **Can you tell me about a time when you had to repair a broken product?** | Event Phase | Costs of repair, time spent on repair, difficulty of finding repair options. |
| **How did you go about finding information on how to repair your product?** | Investigation Phase | Reliability of sources, ease of finding information, trust in ability to repair, Who were the sources |
| **Why did you repair your product rather than replacing it?** | Decision Phase | Costs of repair vs replacement, environmental concerns, emotional attachment to product. |
| **How did you decide if you repair it yourself, bring it to a professional repairer, or repair it in a repair cafe?** | Decision Phase | Skills necessary |
| If Service: **Can you tell me about your experience arranging for your product to be repaired? How did you find a place?** | Arranging Phase | Availability of repair options, ease of scheduling, communication with repair provider, trust |
| If Repair Cafe: **Can you tell me about your experience going to a repair cafe? How did you find a place?** | Arranging Phase | Information online, Communication before |
| **How did the repair professional diagnose the product when you brought your product in for repair?** | Diagnostic phase | Clarity of problem, communication with repair provider, trust in diagnostic assessment. |
| If Service: **Can you tell me about your experience with the repair service itself?** | Repair Phase | Quality of repair, time spent on repair, communication with repair provider. |

# 4. Future

| Question | Topics to Dive Deeper |
|---|---|
| How could the repair process be made more convenient for you? Are there any additional services or features that would enhance your experience? | |
| How would the perfect repair service look like for you? | |
| Is there anything else you want to share about your experience with repairing products? | |

# 5. Additional Questions

| Question | Topics to Dive Deeper |
|---|---|
| Who do you ask for help when a product is broken? | |
| Is there anything else you want to share about your experience with repairing products? | |

# 6. Wrap-up

| Question | Purpose |
|---|---|
| What was the most important thing you shared today? | |
| Is it okay if I follow up with you in the future if I have any additional questions? | |
| Thank you so much for taking the time to speak with me today! | |

## 7.2 Interviews Master Thesis

### Experts

| Code | Name | Organisation | Role |
|------|------|--------------|------|
| E1 | Ludo de Gooije & Alex Klootwijk | Repair Café Wijkpalais | Organizers & Repairers |
| E2 | Bas Flipsen | TU Delft | Lecturer with focus on Repair |
| E3 | Danielle van der Wouden | Het Goed Rotterdam Zuid | Store manager |
| E4 | Jean Kap | Repair Café de Esch | Repair Volunteer |
| E5 | Virpi Heybroek | Gemeente Rotterdam | Transition Manager Consumer Goods |

### Consumers

| Code | Code Name | Age/ Gender | Occupation | Items |
|------|-----------|-------------|------------|-------|
| C1 | Maren | 26/ F | Student, Psychology | Shoes, Laptop, Milkfoamer |
| C2 | Karel | 31/ M | Architect | Coffee Machine, Pants |
| C3 | Joanna | 24/ F | Student, Design | Smartphone, Shirt |
| C4 | John | 41/ M | IT Manager | Laptop, Phone, Coffee Machine |
| C5 | Ann | 39/ F | House Maker | Coffee Machine, Jacket, Pants |
| C6 | Lauren | 31/ F | Student, Business Administration | Pants, Bikes |
| C7 | Gijs | 29/ F | Designer | Coffee Machine, Pants, Keyboard |

## 7.3    List of Material Necessary for the RepairEducation Workshop

**General**
- Laptop (to look for instructions and parts)

| **Electronics:** | **Textiles** | **Bicycle:** | **Various** |
|------------------|--------------|--------------|-------------|
| • Set of pliers<br>• Set of screwdrivers<br>• Multimeter<br>• Lab Power supply<br>• Soldering iron<br>• Isopropyl Alcohol<br>• Cotton Swabs<br>• Batteries<br>• Fuses<br>• Cables<br>• Lead-Free Solder<br>• Screws<br>• Safety Glasses<br>• Various Lubricants, cleaners and oils | • Yarn in various colors and thicknesses<br>• Buttons<br>• Needles<br>• Sewing Machine<br>• Patches<br>• Zippers<br>• Glue | • Patches & Solvent<br>• Tire levers<br>• Chain Oil<br>• Degreaser<br>• Penetrating Oil<br>• Rag<br>• Set of Screwdrivers<br>• Set of Hex Keys<br>• Pliers | • Glues<br>• Tapes<br>• Cleaning Supply<br>• Hand Tools<br>• Cordless Drill<br>• Drill Bits<br>• Zip-Ties |

## 7.4 List of Repair Cafes in Rotterdam

Last checked: 11 Jan 2024

Repair Cafes Rotterdam

| | Name | Area | Adress | Opening Hours | Contact | Organisation | Visited | Notes | Confirmed |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Repair Cafe Schiebroek | Schiebroek | Larikslaan 200, 3053 LG Rotterdam, Netherlands<br><br>Huis van de Wijk 'de Buurvrouw' | third wednesday of the Month 9.30-11.15 | repaircafeschiebroek@gmail.com<br><br>https://repaircafeschiebroek.nl/ | | no | opened November 2023<br><br>Very Close to Upcycle Mall | https://repaircafeschiebroek.nl/ |
| 2 | Repair Cafe De Esch | De Esch | Rijnwaterstraat 23 3063 HC Rotterdam<br><br>Huis van de Wijk Pompgebouw De Esch | Tuesday, Wednesday, Thursday 13.00-16.00 | 06 24 30 43 95 | DOCK | yes | | https://www.dock.nl/locaties/rotterdam/kralingen-crooswijk/huis-van-de-wijk-pompgebouw-de-esch/ |
| 3 | Repair Cafe Het Mooite Waard + Textiel Repair Cafe | Middelland | Claes de Vrieselaan 72 3021 JS Rotterdam | Saturday, 10.00-12.30 | https://www.wijkpaleis.nl/ | Wijkpaleis | yes | Textiles and Electronics, Bikes | https://www.wijkpaleis.nl/ |
| 4 | Repair Cafe Thuis in West | Delfshaven | Tues | first and third Wednesday of the Month 10.00-13.00 | info@thuisinwest.nl<br><br>https://www.thuisinwest.nl/repair-cafe/ | Thuis in West | yes | | https://www.thuisinwest.nl/repair-cafe/ |
| 5 | Repair Cafe West | Oude Westen | Gaffelstraat 61B 3014 RC Rotterdam | First and third Saturday of the Month 13.00-17.00 | repaircaferotterdamwest@gmail.com | Socialistische Partij | yes but was closed | | |
| 6 | Doe Het Zelf Werkplaats | Agniesebuurt | Schout Heynric Straat | Tuesday 18.00-21.00 | doehetzelfwerkplaats@gmail.com | | yes | Bikes | |
| 7 | Repair Cafe Oost | Zevendijk, Prins Alexander | Ambachtsplein 141, 3030 xa, | Monday 14.00-16.00 | https://www.facebook.com/repaircaferotterdam/ | | yes, but closed early that day | | |
| 8 | Repair Cafe Oost | Prins Alexander | Duikerstraat 29 3067 TK Rotterdam | Wednesday 14.00-16.00 | | | | | |
| 9 | Repair Cafe Noord | Oude Noorden | Noordplein 12, 3032 XL Rotterdam<br><br>De Villa | every second saturday of the month<br><br>10.00-12.00 | repaircafe.rotterdam.noord@gmail.com<br><br>https://repaircaferotterdamnoord.wordpress.com/<br><br>https://www.facebook.com/RepairCafeRotterdamNoord/?locale=nl_NL | | no | | https://www.facebook.com/repaircaferotterdam/ |
| 10 | Repair Cafe Charlois | Charlois | Slinge 250 3085 EX Rotterdam<br><br>Huis van de Wijk Middelpunt | Last Wednesday of the Month 18.00-21.00 | https://repaircafecharlois.nl/<br><br>info@repaircafecharlois.nl | | no | | |
| 11 | Miks Fix Service | Nesselande | Cypruslaan 406 3059 XA Rotterdam<br><br>Huis van de Wijk Kristal | Mondays 10.00-12.00 | | BUURTWERK | No | Klussendienst Small Fixes | https://www.gro-up.nl/media/n05neuns/activiteitenoverzicht-nesselande.pdf |
| 12 | Repair Cafe Halte | Overschie | Hoge Schiehof | Wednesdays | https://www.wmoradar | WMO | No | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 39<br>3042AZ<br><br>Huis van de wijk de Halte | 14.00-16.00 | .nl/district/huis-van-de-wijk-de-halte/ | RADAR | | | |
| 13 | **Repair Cafe Hoogvliet** | Hoogvliet | Mosoelstraat 20, 3193 EL Hoogvlie<br><br>Huis van de Wijk 'De Zevensprong' | Last Saturday of the month<br>9.00-12.00 | https://www.dock.nl/locaties/rotterdam/hoogvliet/huis-van-de-wijk-zevensprong/ | DOCK | No | | https://www.dock.nl/media/fvpntwlr/_activiteiten-volwassenen-hoogvliet-liggend-32.pdf |
| 14 | **Repair Cafe Hoek van Holland** | Hoek van Holland | Badweg 67, 3151HA Hoek van Holland | Tuesday, Wednesday<br><br>11.00-16.00 | https://www.kringloopcentrumhvh.nl/repaircafe<br><br>repaircafe@kringloopcentrumhvh.nl<br><br>06 85414729 | Kringloop Center Hoek van Holland | No | | |

# Repair in your Neighborhood

**Miks fix Service**
Electronics
Mondays 10-12 uur
Cypruslaan 404, 3059XA

**RepairHub DE HER**
Electronics
Saturday 10-15 uur
Sunday 10- 15 uur
Bovendijk 141
3034PD

**Repair Cafe Schiebroek**
Electronics & Textiles
3rd Wed of the Month 14-16 uur
Larikslaan, 3053LG

**Repair Cafe Zevenkamp**
Electronics
Wednesdays 13.30-15.30 uur
Ambachtsplein 141, 3068GV

**Repair Cafe Lage Land**
Electronics & Textiles
Mondays 13.30-15.30 uur
Duikerstraat 29, 3067 TK

**Repair Cafe Halte**
Electronics & Textiles
Wednesdays 14-16 uur
Hoge Schiehof 39, 3042AZ

**Doe-Het-Zelf Werkplaats**
Bicycles
Tuesdays 18-21 uur
Schout Heynricstraat 3032PH

**Repair Cafe Het Mooite Waard**
Electronics & Textiles
Saturdays
10-12.30 uur
Claes de Vrieselaan 72, 3021JS

**Repair Cafe Noord**
Electronics & Textiles
2nd Sat of the Month    10-12 uur
Noordplein 12, 3032XL

**Repair Cafe De Esch**
Electronics
Tue, Wed, Thu
13-16 uur
Rijnwaterstraat 23 3063HC

**Repair Cafe Thuis in West**
Electronics & Textiles
1st and 3rd Wednesday of the Month
14-16 uur
Robert Fruinstraat 26, 3021 XE

**Repair Cafe West**
Electronics & Textiles
1st and 3rd Saturday of the Month
13-17 uur
Gaffelstraat 61B, 3014RC

**Repair Cafe Hoogvliet**
Electronics & Textiles
last Saturday of the Month
9-12 uur
Mosoelstraat 20,  3193EL

**Repair Cafe Rozenburg**
Electronics & Textiles
Tuesdays 13-14 uur
Lekstraat 2,  3193EL

**Repair Cafe Charlois**
Electronics & Textiles
Last Wed of the Month 18-21 uur
Slinge 250, 3085EX

**Repair Cafe Hoek van Holland**
Electronics & Textiles
Tuesdays, Wednesdays 11-16 uur
Badweg 67, 3151HA

MORE INFORMATION

TAKE A MAP WITH YOU

Your old CD-Player doesn't work? There is a hole in your favourite jumper? Don't despair and fix it:

Repair Cafés are free meeting places and they're all about repairing things (together). In the place where a Repair Café is located, you'll find tools and materials to help you make any repairs you need.

On clothes, furniture, electrical appliances, bicycles, crockery, appliances, toys, et cetera. You'll also find expert volunteers, with repair skills in all kinds of fields. Visitors bring their broken items from home.

Together with the specialists they start making their repairs in the Repair Café. It's an ongoing learning process. If you have nothing to repair, you can enjoy a cup of tea or coffee.

There are over **16** places for Community Repair in Rotterdam. Take a map, so you know where they are and visit one in your Neighborhood to fix one of your beloved items.
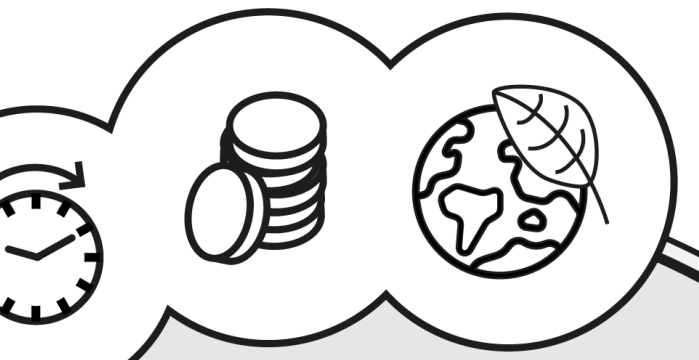
...et fast and free Advice

# Repair Here & Now

...here, at the RepairHub

**Saturday 9-16 uur**
**Sunday   9-16 uur**

You  brought a broken device and
want to find out if it might be
repairable?
In the Repair Hub our Repair
Experts  will help you by assessing,
if a repair is possible or not, how
much it will cost, and how long it
will take. They will help you with the
repair and order the right parts for
replacement with you if nescessary.

**Save your device, save money and
learn a new skill.**

**OPEN**

# 7.4 Webpage Mockup (Details)



https://rotterdamcirculair.nl/repareeren

NL En

Repair together in Rotterdam

Why?  Where?  When?  News  Volunteer

**Open Today** *Repair Together Upcyle Mall ••• Repair Cafe De Esch ••• Naai Cafe Overschie*

## February

| 1 | 2 | 3 |
|---|---|---|
| **Zevenkamp** *12-15 uur* | **Zevenkamp** *12-15 uur* | **Thuisinwest** *12-15 uur* |
| **Middeland** *18-20 uur* | **Middeland** *18-20 uur* | |
| | **Upcycle Mall** *10-16 uur* | |

| 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|
| **Upcycle Mall** *10-16 uur* | **De Esch** *10-16 uur* | **De Esch** *10-16 uur* | **De Esch** *10-16 uur* | **Zevenkamp** *12-15 uur* | **Zevenkamp** *12-15 uur* | **Thuisinwest** *12-15 uur* |
| **Zevenkamp** *12-15 uur* | **Zevenkamp** *12-15 uur* | | **Zevenkamp** *12-15 uur* | **Middeland** *18-20 uur* | **Middeland** *18-20 uur* | |
| **Charlois** *18-20 uur* | **DHZ Werkplaats** *12-15 uur* | | **Charlois** *18-20 uur* | | **Upcycle Mall** *10-16 uur* | |

| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|

**Repair together in Rotterdam**

Why?    Where?    When?    News    Volunteer



Repair Cafe De Esch

Electronics & Textiles
Every Day 14-16am
Bovendijk

**Repair Cafe Zevenkamp**

Electronics & Textiles

Wednesdays 14-16am

Ambachtsplein 141
3068GV

**RepairCafe De Esch**

Electronics

In the neighborhood De Esch, three days a week the four volunteers will help you to Repair you Electronics. The repair cafe is located on the third floor of the neighborhood community center De Pomp. Unlike most other Repaiir cafes in Rotterdam, they will support you with ordering parts and repairing the device for you. Just drop by!

Wednesdays 12-16pm
Thursdays 12-16pm
Fridays 12-16pm

Rijnwaterstraat 11,
3063HC Rotterdam

## How it works?

Community Repair Events and repair cafes are organized by Citizens. The people involved are volunteers and are happy to spend their free time assisting you with the repairs.

Are you a Handy-Harry yourself and like to be part of a community of makers helping their neighborhood? Jus visit a repair cafe and ask them to joi. They'll gladly give you more information.

Listed below Repair Cafes in rotterdam as on the map on the other side of this leaflet

Listed below Repair Cafes in Rotterdam as on the map on the other side of this leaflet

**1** **Repair Cafe Schiebroek**
Third Wednesday of the Month 9.30-11.15
Larikslaan 200, 3053LG Rotterdam

**2** **Repair Cafe De Esch**
Tuesday, Wednesday, Thursday 13.00-16.00
Rijnwaterstraat 23, 3063HC Rotterdam

**3** **Repair Cafe Het Mooite Waard**
Saturday, 10.00-12.30
Claes de Vrieselaan 72, 3021JS Rotterdam

**4** **Repair Cafe Thuis in West**
1st and 3rd Wednesday of the Month 10.00-13.00
Robert Fruinstraat 28, 3021XE Rotterdam

**5** **Repair Cafe West**
1st and 3rd Saturday of the Month, 13.00-17.00
Gaffelstraat 61B, 3014RC Rotterdam

**6** **Doe-het-Zelf Werkplaats**
Tuesday, 18.00-20.00
Schout Heynric-Straat, 3032SX

## Community Repair

Your old CD-Player doesn't work? There is a hole in your favourite jumper? Don't despair and fix it:

Repair Cafés are free meeting places and they're all about repairing things (together). In the place where a Repair Café is located, you'll find tools and materials to help you make any repairs you need.

On clothes, furniture, electrical devices, bicycles, crockery, appliances, toys, et cetera. You'll also find expert volunteers, with repair skills in all kinds of fields. Visitors bring their broken items from home. Together with the volunteers they start making their repairs in the Repair Café. It's an ongoing learning process.

There are over 20 places for Community Repair in Rotterdam. Take a map, so you know where they are and visit one in your Neighborhood to fix one of your beloved items.

## Benefits

Repairing your goods has multiple benefits, not just for society but also for you personally:

**You are saving money:** Overall repairing is cheaper then buying a new object. Especially with the free help of the volunteers

**You are saving a beloved object:** That old sweater you once bought with your mom, the camera you have since childhood. Sometimes things can break but keep them and the memory alive by repairing them

**You are learning a new skill with fun people:** Repairing together allows you to learn more about creative ways to bring objects back to live. It's often easier then you think and volunteers are happy to lead the way for you.

**It's good for the Environment:** By repairing you are not only limitizing the creation of potentially hazardous waste, but alspreserving precious resources and habitiats all over the world

MORE INFORMATION

# Repair Together in Rotterdam

# Map of Community Repair
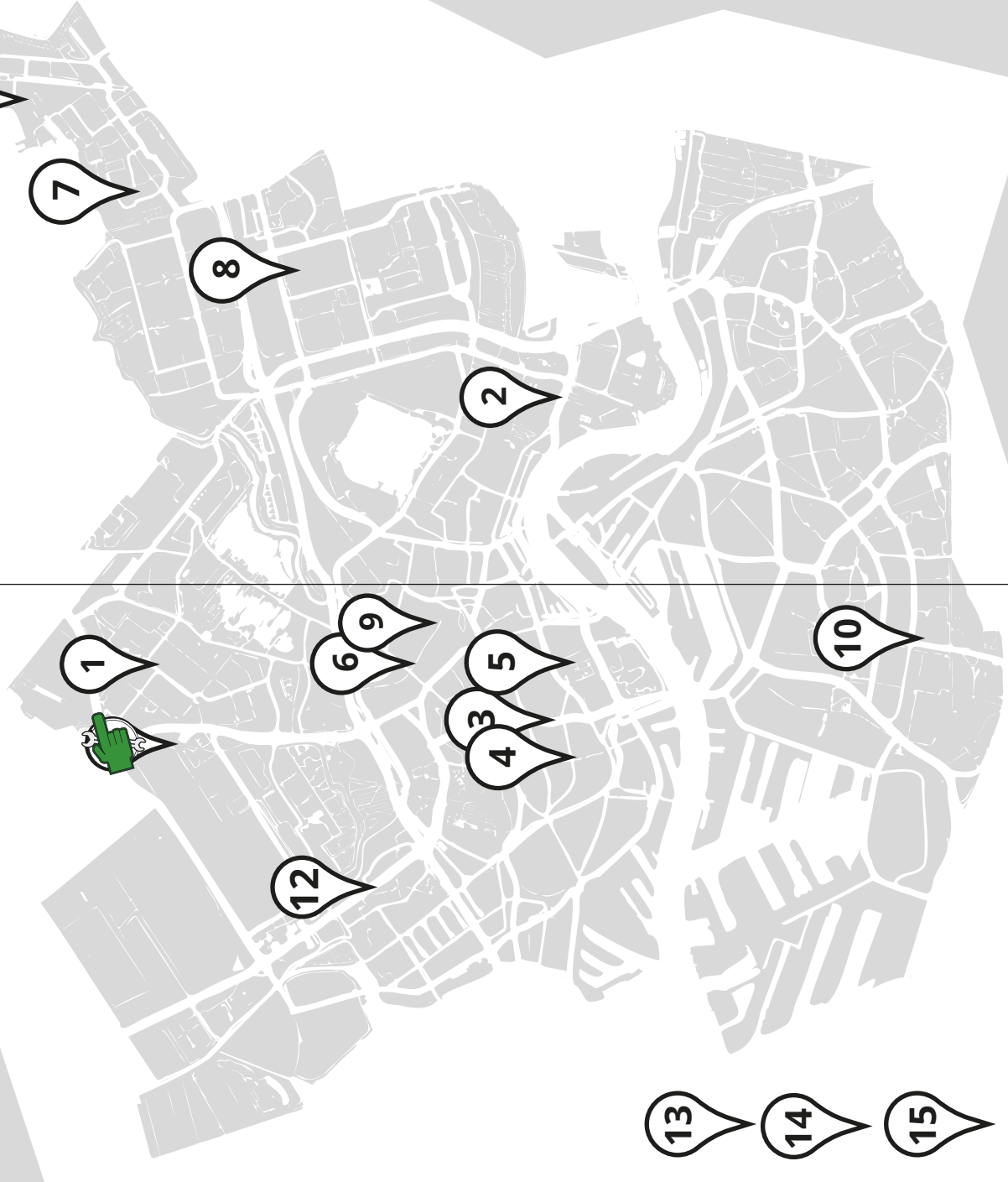
**7 Repair Cafe Zevenkamp**
Monday 14.00-16.00
Ambachtsplein 141, 3030XA Rotterdam

**8 Repair Cafe Het Lage Land**
Wednesday 14.00-16.00
Duikerstraat 29 3067TK Rotterdam

**9 Repair Cafe Noord**
Second Sunday of the Month, 10.00-12.00
Noordplein 12, 3032XL Rotterdam

**10 Repair Cafe Charlois**
Last Wednesday of the Month 18.00-21.00
Slinge 250, 3085EX Rotterdam

**11 Miks Fix Service**
Mondays 10.00-12.00
Cypruslaan 406, 3059XA Rotterdam

**12 Repair Cafe Halte**
Wednesdays 14.00-16.00
Hoge Schiehof 39, 3042AZ Rotterdam

**13 Repair Cafe Hoogvliet**
Last Saturday of the Month, 9.00-12.00
Mosoelstrat 20, 3193EL Hoogvliet

**14 Repair Cafe Rozenburg**
Tuesday 13.00-14.00
Lekstraat 2, 3193EL Rozenburg

**15 Repair Cafe Hoek van Holland**
Tuesday, Wednesday 11.00-16.00
Badweg 67, 3151HA Hoek van Holland

**RepairHub at the HER**
Saturday and Sunday 9.00-17.00
Bovendijk 121, 30170P

## Overcoming the citizens of Rotterdam barriers to repair

project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple.
Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date   29 - 03 - 2023          18 - 09 - 2023   end date

**INTRODUCTION** **
Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

The municipality of Rotterdam is making an effort to become a circular city by 2030. As a part of this initiative the lifespan of products in use of consumers need to be prolonged.

Although the practice of repair is widespread and has been a cultural practice for millennia, in the most recent year this practice has been on a decline. According to a 2018 survey from the European Commission, only a share of 64% of EU-28 consumers repaired their products. The reasons for this can be found in the throwaway society, harder to repair and cheaper products, and the decrease repair service providers in the last decades. These barriers make buying a new product often the more convenient and even exciting and sometimes the cheaper option for people.

An important field of activities for designers to solve this problem is designing goods to be easily repairable (design for repair), making repairs possible, as well as faster and cheaper. But even with easy-to-repair products, people without a strong DIY attitude need to rely on repair services to repair. Despite the need for repair services for a functioning circular economy, the amount of repair businesses has been on the decline. Research suggests a general mismatch between customers' needs and repair service offerings. Depending on the product to be repaired people have a variety of different options such as neighborhood shops, DIY, or repair cafes.

The Municipality of Rotterdam is soon closing the two recycling centers and will build a larger one close to the airport in the neighborhood of Overschie as a replacement. Part of this new recycling center will be the Upcycle Mall, a place for the citizens of Rotterdam to experience the aspects of a circular economy, including different circular economy practices, such as upcycling, recycling, reselling and possibly repairing . The Upcycle Mall will offer spaces for education, but also several spaces to use as workspaces for circular companies, entrepreneurs, designers, and artists, but also services to the Citizens of Rotterdam. It is intended that the residents and citizens will have access to use the materials arriving at the recycling center. The municipality will rent out these various spaces to entrepreneurs and companies with circular ambitions to create a new circular business hub for the city.

The new Upcycle Mall could play a valuable role in enhancing the repair ecosystem of Rotterdam. In supporting the citizens to repair their products and by that reducing wastage of valuable ressources, saving the citizens money and creating local jobs will help maximize the effect of the Upcycling Mall as a lighthouse project of the circular economy.

space available for images / figures on next page

introduction (continued): space for images



image / figure 1:    Rendering of Building of the Upcycle Mall

**TO PLACE YOUR IMAGE IN THIS AREA:**
- **SAVE THIS DOCUMENT TO YOUR COMPUTER AND OPEN IT IN ADOBE READER**
- **CLICK AREA TO PLACE IMAGE / FIGURE**

**PLEASE NOTE:**
- **IMAGE WILL SCALE TO FIT AUTOMATICALLY**
- **NATIVE IMAGE RATIO IS 16:10**
- **IF YOU EXPERIENCE PROBLEMS IN UPLOADING, COVERT IMAGE TO PDF AND TRY AGAIN**

image / figure 2:

112|

## PROBLEM DEFINITION **
Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

Prolonging the use of a product saves resources, money for the citizen and minimizes waste. To enhance the product longevity of the belonging of the citizens, I will uncover why Rotterdammers often do not repair the products.

The Upcycle mall should display different aspects of the circular economy, and I will find out how it best can fulfill a role to support Rotterdam in repairing their broken belongings. Solutions will be developed to overcome the barriers and convince Rotterdammers of the benefits of product repair. This projects' scope though is not limited to the Upcycle Mall, other promising interventions outside of the Upcycle Mall context, that support the goal making Rotterdammer repair their belongings shall be explored as well. The outcome of this projects are innovative service offerings or campaign concepts executable by the municipality of Rotterdam.

## ASSIGNMENT **
State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, ... . In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

I'm going to research barriers and drivers of repair in Rotterdam and explore opportunities for the municipality to support the citizens in repairing. These opportunities will take the possibilities of the Upcycle Mall into account but are also open to other possibilities of Rotterdam Circulair, in order to maximize the possible impact of the solution.

To display the different aspects of the circular economy, the question is raised of how repair services can be integrated into the concept of the Upcycle Mall. Through the means of qualitative design research answers to the following research question shall be found:

· What barriers do people experience in repairing or having their belongings repaired?
· What opportunities do companies, socially oriented enterprises and NGOs in Rotterdam see for a repair facility in the Upcycle Mall?

Based on this research, recommendations on how a repair facility for clothing and small electronics can be established at the Upcycle Mall will be given to the municipality. Furthermore, opportunities will be explored on how to encourage Rotterdammers to repair or have their belongings repaired more often. These will take shape in the proposal of new service or campaign concepts to be executed by the municipality.

**Personal Project Brief** - IDE Master Graduation

start date   29 - 3 - 2023          18 - 9 - 2023   end date

| Week | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Calendar week | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |
| Date | 29.04. | | | | | | | | | | 05. Jun | | | | | | | | | 14. Aug | | | | | | 18.09. |
| Days Working | 3 | 3 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 0 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | 5 | 5 | 5 | 5 | 0 | 5 | |
| Events | KICKOFF Easter | | | | | | | | | Vacation MidTerm | | | | | | | | | | GreenIg Vacation | | | | | Graduation |

| Task | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Discover** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Literature Review | | | | | | | | | | | | | | | | | | | | | | | | | | |
| State of the Art | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Research of Context | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Interview Setup | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conducting Interviews | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Analysis | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Visualizing Results | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Define** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Co-Creation of Interventions | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Develop** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Design Interventions | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Iterate | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Validate | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Deliver** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Intermediate Report to Municpality | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Presentation | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Report | | | | | | | | | | | | | | | | | | | | | | | | | | |

I will first start with a literature review on the barriers and drivers of repair behavior and mapping the context with expert and stakeholder interviews. Furthermore, in this first stage, the current situation of repair options for Rotterdammers will be mapped, as well as best practice examples from other municipalities and countries will be collected. To understand the different attitudes on repair personas will be created.

The second part will be identifying key factors influencing behavior. It will consist of a user journey mapping study, to map of different citizen's experiences of multiple services into one deliverable. The data for this will be created through multiple in-depth Interviews with Rotterdammers and enriched with a qualitative survey. I will design one visual experience map as an outcome, explaining the barriers, drivers, and facilitators of repair.

Based on the research and the requirements, in the later stage, interventions will be designed to promote circular behavior regarding repairing. This will be done through creative sessions and a workshop integrating citizens and possibly stakeholders in the development of these options and a prototype will be further developed under consideration of the feasibility and viability of the municipality, and the applicability to Upcycle Mall. The final intervention will be qualitatively validated with a bootstrapped pilot test of a minimum viable product, a prototype to test and communicate the general function of the concept.

Initials & Name _____     Student number _____

Title of Project    Overcoming the citizens of Rotterdam barriers to repair _____

## MOTIVATION AND PERSONAL AMBITIONS

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, ... . Stick to no more than five ambitions.

I've set up this project as it matches my interest as designer to work on facilitating sustainable behavior within cities. I want to build upon competencies learned in the courses 'Design and the City' and 'Social Venturing' and expand my knowledge on my participatory city making. With the topic of Repairing, it also involves a personal interest of mine, as I've been volunteering in a bike kitchen/ Repair Cafe since I've moved to Rotterdam one and a half years ago. Furthermore, I'm excited to work with the municipality of Rotterdam, which is my current home and will hopefully stay that after my graduation.

Over the course of this project, I want to broaden my skills in conducting a practical qualitative research study and acquire a better understanding of how to co-create feasible design proposals based on them. I want to enhance my interviewing skills as well as the skill of conducting structured analysis. The project addresses the needs and the interests of multiple stakeholders, the citizens, the municipality and businesses in the city and I'm looking forward to encountering different perspectives on the topic and challenge my own views. Alongside this project gives me the opportunity to work on my project management skills as well as practicing communications to different stakeholders.

The proposed project suits my vision for my professional career as a designer, first because of the thematic focus and second because of the hands on approach with the aim to deliver feasible concepts supporting a more sustainable behavior of urban citizens.

## FINAL COMMENTS

In case your project brief needs final comments, please add any information you think is relevant.

Initials & Name _____     Student number _____

Title of Project     Overcoming the citizens of Rotterdam barriers to repair _____