Design for participation

A CIRCULAR CENTRE IN DE BUCH

MASTER THESIS

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*Many people don't need
to be served,
they need to be enabled.*

Ezio Manzini, 2010

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Executive Summary

Over the past decades, a culture that rapidly produces, consumes and discards earthly resources is established. The extraction and processing of these resources lead to an increasing amount of greenhouse gas emissions which are warming the planet day by day. In 2016 the European Union signed the Paris-agreement. This agreement aims to avoid this dangerous climate change by limiting global warming to 1.5°C (EU, 2016). To accomplish, the Dutch government (Rijksoverheid), introduced the Klimaatakkoord. Among other things, the Klimaatakkord acknowledges the transition to a circular economy as an essential strategy to accomplish the EU goals. By 2050, the Netherlands aims to be a circular economy where products and materials are reused in endless loops.

This thesis focuses on the disposal of bulky waste, such as household goods or private construction materials. These type of products are usually discarded at the municipal recycling facility. The assignment explores on behalf of de BUCH (Bergen, Uitgeest, Castricum, Heiloo) municipalities alternatives for bulky waste disposal. The project takes off at the idea of a circular centre; a concept developed by Rijkswaterstaat. Circular centres are municipal recycling facilities, where not only waste is processed but also various recycling alternatives are offered.

The role of the residents living in de BUCH area is identified as key-enabler in the transition towards a local circular economy. The plans for a circular centre in de BUCH also describes the active involvement and contributions of residents as an essential success factor. Currently, only a limited amount of people is actively engaged in circular activities. To make the circular centre a broadly supported success, it requires a different attitude and behaviour towards used materials for many residents.

This project investigates how resident participation in circular initiatives can be encouraged in various ways. Literature on behavioural change has been consulted and models developed by Fogg (2009), Tromp (2013) and van Lieren (2018) were practised. The current attitude and the behaviour of residents regarding product disposal was obtained through interviews and a questionnaire. New roles for the residents has been established according to this data. The roles were held against Fischer's model for richer ecologies of participation (2011).

The obtained knowledge was translated into concepts and discussed with residents. A research-through-design approach was practised to identify barriers for participation and apply universal behavioural strategies in more tangible ways. These concepts were assessed by the residents using video prototypes. The following interviews provided insight into the barriers for participation and the possible strategies that could lower them.

Based on these insights and insights from earlier phases, a toolkit has been developed which helps the municipality to design initiatives together with its residents. The toolkit aims to design interventions that overcome the barriers for participation and enhance resident participation at higher levels. A number of the barriers and behavioural strategies have been evaluated through an intervention at the municipal recycling facility.

The toolkit consists of 3 design canvasses poster and a card set.
During the use of the toolkit, interventions are created by means of a user journey. The user journey provides an easy way to identify the barriers for participation. The included cards present a set of common barriers. The barrier cards link to strategies that can be applied to overcome them.
The strategy cards can be used as an inspiration during the enhancement of new participatory circular initiatives.

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I.
PROJECT
INTRODUCTION

Within this first chapter, the topic of this thesis is introduced. The reader will get acquainted with project scope and the involved parties. Thereafter, the chapter elaborates on the project approach and closes off with the formulated research questions. These research questions are the starting point of the up-following chapter.

1. Introduction

1.1 PROJECT SCOPE

Over the past decades, consumerism and economic prosperity have greatly influenced our life-styles. We established a culture that rapidly produces, consumes and discards resources such as food, materials and energy in irresponsible ways. The extraction and processing of these resources lead to an increasing amount of greenhouse gas emissions which are warming our planet day by day.

In 2016 the European Union signed the Paris-agreement. This agreement aims to avoid dangerous climate change by limiting global warming to 1.5°C (EU, 2016). To accomplish, the ministry of 'economic affairs and climate' of the Dutch government (Rijksoverheid), introduced the Klimaatakkoord.

Among other things, the Klimaatakkord acknowledges the transition to a circular economy as an essential strategy to accomplish the EU goals. Therefore, the Netherlands ambitions to become circular by 2050 and be an example for other nations.
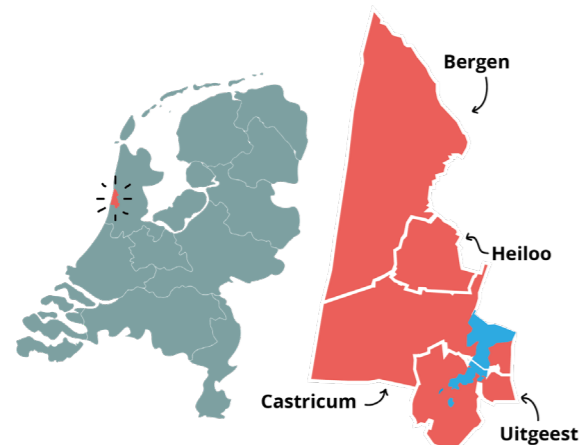

Figure 1 : Location BUCH within the Netherlands

In a circular economy, waste is eliminated from society. Products and materials are reused, refurbished and recycled in endless loops.

Consumers play a significant role in the transition from a linear to a circular economy. They can contribute by, e.g., using items longer, buying second hand and carefully separating items after use. This proposes a break with the inherent, non-circular behavioural patterns people developed over the years. With the familiar and convenient alternatives still prominently present, it requires more effort and motivation to behave circularly.

This thesis focuses on the disposal of bulky waste, such as household goods or private construction materials. These type of products are usually discarded at the municipal recycling facility. To reduce this amount, this project explores circular alternatives for bulky waste disposal. The motives and abilities of a residential group living in the BUCH (Figure 1) are taken into account when designing a strategy to encourage circular behaviour.

1.2 INITIATION OF THE PROJECT

De BUCH is a work organization of four smaller independent municipalities in the Netherlands (Figure 1). The municipalities of Bergen, Uitgeest, Castricum and Heiloo have joined forces to tackle the national target for residual waste. Together they have formulated a new policy regarding raw materials. The policy incorporates an analysis of the feasibility of a circular centre; a place for various circular initiatives that was invented by Rijkswaterstaat.

In the summer of 2019, Rijkswaterstaat

ran a contest for municipalities to develop a well-thought-out plan for setting up a circular centre. A circular centre is a central place where raw materials, products and waste within the municipality are processed and reused. It could unite several institutions such as; a municipal recycling facility, a repair café, a workshop and thrift store in the same location. By means of a centre, most municipalities aim to bring back the amount of bulky residual waste. In case of the BUCH this needs to be reduced to an annual amount of 5 kg per resident.

The plan submitted by de BUCH differentiated itself by its participatory approach. An independent jury reviewed awarded it with a subsidy for further development. By collaborating with BSc Industrial Design Engineering students of Delft University of Technology and the Bonhoeffer College Castricum, de BUCH already obtained design knowledge and various (product) ideas that re-purpose waste material (Appendix A2).

Next to the collaboration with schools and the university, the submitted plan describes the ambition to actively involve residents by offering workshops, educational modules and events at the circular centre. Youth with a distance from the labour market will occupy the workshop and seize the opportunity to develop skills that help them transform local waste into valuable products. The circular craft centre will be a convenient go-to, where circular awareness is raised, and residents contribute to a local circular economy.

Nevertheless, it remained unclear how and if residents want to participate in the envisioned circular centre. To give a voice to the residents and involve them in the development of a local circular economy de BUCH has called upon the Participatory City Making Lab.

1.3 PARTICIPATORY CITY MAKING LAB

The Participatory City Making Lab is part of The Delft Design Labs. The Delft Design Labs is an initiative of the Faculty of Industrial Design Engineering at Delft University of Technology. The Labs serve as a platform for prolific collaborations with all kinds of societal stakeholders. Each Delft Design Lab enhances the integration of design and research and outlines that scientific and societal contribution go hand-in-hand.

The Participatory City Making Lab aims to develop a framework that enhances participatory city-making. It explores the interactions between grassroots initiatives and public administration through smaller studies and experiments. These smaller studies and experiments can be used as a way to catalyse larger changes or even transitions .

1.4 DESIGN BRIEF

The transformation from a municipal recycling facility to participatory circular centre leaps towards a new local economy with a different attitude towards used materials. Assuming, this transformation can only be successful when it is broadly supported by the residents of de BUCH municipalities.

To design an effective intervention which will ease this transformation, it is important to understand how (and if) individuals want to contribute to a circular craft centre. By identifying the barriers and motives for participating in a local circular economy, interventions can be designed which sparks the contribution of residential groups.

The designed intervention(s) will enhance the circular disposal of household goods and set course towards a participatory circular economy.

2. Design approach

2.1 PROJECT SCOPE

Design can be considered a way of gathering resources to create value (Nonaka & Konno, 1976; Ramaswamy, 2009)
With this definition, the role of design within the circular economy can be identified rather straight forward:
In a circular economy, the way of gathering resources (raw materials) differs, and therefore designs have to change accordingly. In the past years, considerable knowledge is obtained about how physical products should be designed to fit within a circular system (e.g. design for repair or long-lasting products) Yet, the role of the consumer and its break with behavioural patterns is oftentimes overlooked (Wastling, Charnley & Moreno, 2018). These behavioural patterns are studied within the scope of this project.

When looking at the above-mentioned definition of design in an abstract way, the process of transitioning towards a circular economy can also be considered as a design process. Thinking of a transition as a design process, can help in understanding activities towards sustainability transitions and can be a source for new methods, activities and ways to collaborate with stakeholders (De Koning, Puerari, Mulder, & Loorbach, 2019, p.4).

In case of the BUCH, De Koning et al. (2019) acknowledge a participatory approach as a way to enrich the value of the local circular economy. The Participatory City Making approach connects top-down (institutional) initiatives with bottom-up (citizen) social innovation. It makes use of a human-centred design perspective to guide the entire process.

As much participatory design seems to be about finding the best solution for all people involved, more important is the activity of collaborative framing and prototyping of what the 'object' to design needs to be. The focus on obtaining complete and integral viewpoints enable many to design for resilience. (Mulder & Loorbach, 2018, p.6). Therefore, the role of design is not only a means to achieve a goal, but the application of design methods itself is already a valuable experience to initiate crossover collaborations.

This project aims to set sail towards a participative environment which brings together otherwise unconnected individuals and ideas. It provides a structure to create participatory initiatives which can be seen as small seeds in the development of a local circular economy. The interventions created, facilitates a way to participate in a local circular economy in an empowered manner.

2.2 DESIGN PROCESS

This project follows a rather typical double-diamond process (Design Council, 2005) which is a visualization of diverging and converging stages (Figure 2). The process is divided into four main phases which are: discover, define, develop, and deliver.
During each phase, various design elements and methods that were taught at the Industrial Design Engineering faculty are used. Within every phase, the human perspective is highly considered, making the design approach a human-centred one.

DISCOVER
The first diamond helps to understand, rather than simply assume what the current problem is. Within this project, the discover phase is split up in two chapters: Understand and Empathize.
In the Understanding chapter, literature research is conducted to obtain a better understanding of definitions and theoretical mechanisms. Additionally, the contextual state of the art is explored through a case study.
In the next chapter, people come in. By empathizing through speaking and spending time with people who are affected by the issue, the human perspective is explored.

DEFINE
All the insights gathered from the discovery phase are now structured to narrow your scope. This phase is about defining how to tackle the challenge. Different tools are used to define the target group and identify opportunities.

DEVELOP
The second diamond tries to give answers to the earlier defined design statement. It seeks inspiration from

elsewhere and involves others into the design process.
Within this project, the development phase followed research through design approach in which ideas were discussed and polled amongst residents and others who were affected by the issue. Proposing ideas encourages people to think along and identified latent needs and strategies to encourage circular behaviour.

DELIVER
The previous phase concludes with strategies to overcome the barriers for participation in circular initiatives. In the delivery phase, the strategies have been incorporated into a toolkit. With the toolkit, initiative takers and the municipality can get started on designing circular initiatives in which residents play a significant role. With the use of behavioural strategies, participation on different levels is stimulated.
The strategies used in the toolkit were evaluated through an intervention. This lead to some final recommendations for the toolkit.
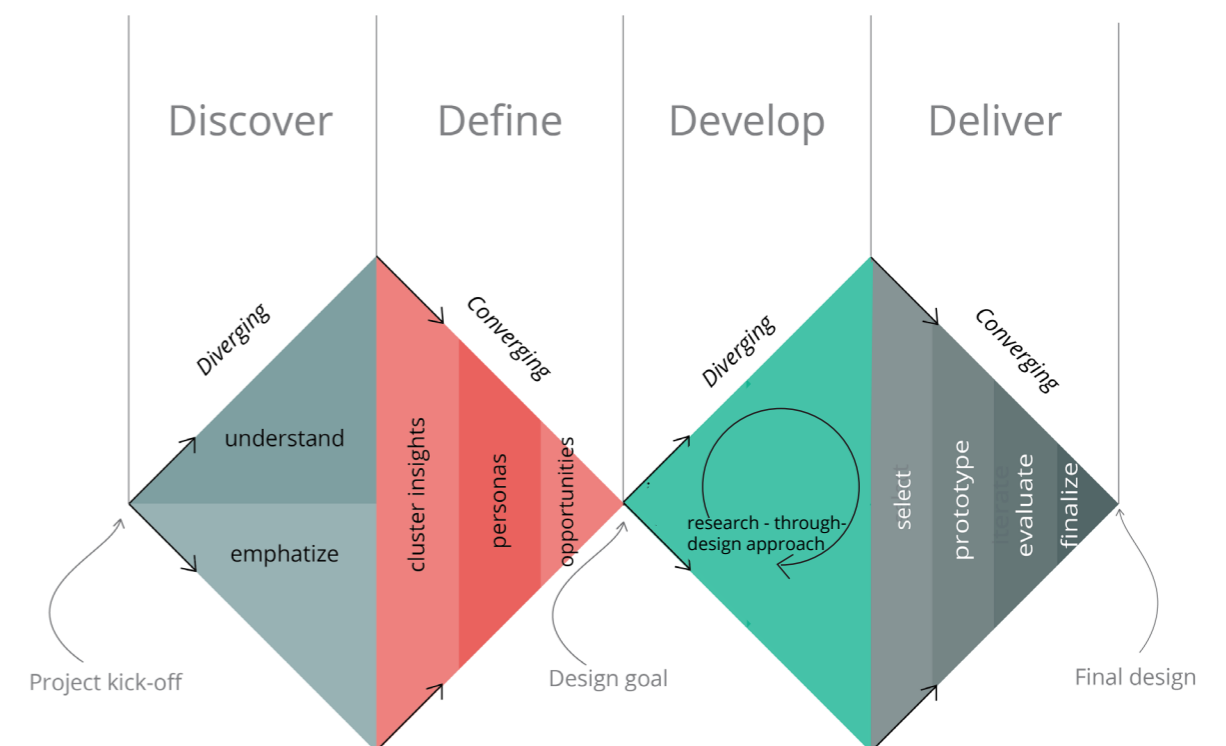
Figure 2 : Project approach visualized as a double diamond

2.3 DESIGN ELEMENTS

This project makes use of the following key design elements, which are part of a designers skill set. Yet, civil servants, area directors or initiative takers are also very likely to possess these capabilities but might need to exploit them more consciously. This process requires to exploit the following capabilities:

Divergent or creative thinking can help you look at your ideas or problems from different angles

DIVERGENT THINKING

The needs of the people who will be affected by the design project should be at the core of the process

HUMAN CENTREDNESS

Make your complex problem or ideas understandable and engaging through stories and visualizations.

STORY TELLING
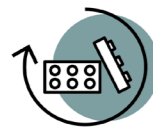
Go through multiple cycles of ideation, prototyping, and small-scale validation.

EXPERIMENT

2.4 RESEARCH QUESTIONS

Ultimately, this design brief desires an answer to the question: What should we offer to BUCH residents empower them to reduce their residual bulky waste?

De BUCH believes transforming the recycling facility to a circular craft centre will contribute to this. The first step of the research is, therefore finding out why the BUCH should consider a circular centre(why). Additionally, it is evaluated

how residents prefer to contribute and how design can enable participation (how). Finally, a solution is designed that reduces the amount of bulky residual waste (what') (Figure 3).

In this graduation project, the following main research questions will be answered by following the intended approach and applying multiple tools and methods (van Boeijen and Daalhuizen, 2013)

RQ1: Why should de BUCH consider a participative circular centre?

RQ2: How do residents want to contribute to a circular municipality?

RQ3: How can design trigger circular participation?

RQ4: What should be offered to BUCH residents to empower them to reduce their amount of bulky residual waste?

The project brief, as approved by the IDE board of examiners, can be found in Appendix A1.
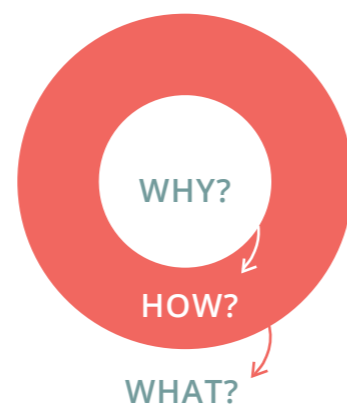
Figure 3 : Golden Circle Simon Sinek; start with the why

II.
DISCOVER

Now the project is introduced, this chapter tries to answer the first research questions and explores the current context of product disposal. This is done in a two-folded manner, which corresponds to the following two sub-chapters:

1. Understand
This chapter elaborates on definitions; maps the current waste system and consults literature on behavioural change and participation.

2. Empathize
Within this chapter, field research is performed to explore the perspective and behaviour of residents regarding product disposal.

© Careman, S. (2017) Gooi toch weg, die zooi. Gaby Suhr, 'ontspul'-coach helpt familie Pellemans met het opruimen [Photo].

1. Circular Economy

01
UNDERSTAND

This sub-section was created to group the background information on definitions; the resource management systems and literature on behavioural design and participation.
Knowledge was mainly gathered through desk research and interviews with BUCH employees.

In the past 15 decades, we have been living a linear economy, in which we take, make, use and discard like a one-way street. Since the introduction of the production belt mass production has taken off. Consumerism has found its way to our deeply rooted habits that make us buy something new when our product does not obey the latest trend or lack the newest functionalities. Products are discarded despite their perfect condition.

Although this economic model has brought much wealth, it is in the long term not sustainable from an environmental perspective. It is necessary to use raw materials sparingly because the earth's resources are not endless. At the same time, the demand for raw materials is increasing, as the world population continues to grow and to become increasingly prosperous.

In a circular economy (CE), the economic and environmental value of materials is preserved for as long as possible. This can be done by extending the lifetime of the products or by bringing materials back in the system (Figure 4). The idea of waste does not exist in a CE, because products and materials are reused and cycled indefinitely (den Hollander, Bakker & Hultink, 2017) .

1.1 CIRCULARITY IN THE NETHERLANDS

EU climate regulations put pressure on all participating nations to undertake ambitious efforts to combat climate change and preserve resources. As a consequence, the Netherlands rolls out a government-wide programme to become a CE by 2050. This means that by 2050 all raw materials will be used

and reused efficiently without harmful emissions into the environment. In order to achieve this, technological, social, and system innovations will have to be implemented (Ministry of Infrastructure and Environment, & Ministry of Economic Affairs, 2016).

VANG
The VANG (Van Afval Naar Grondstof) program is a part of the Government-wide Program for the CE and focuses on household waste. The VANG - Household waste program contains objectives towards a CE which municipalities can use when drawing up their local policies (VANG HHA, 2018). The objective of the program includes an ambition to achieve 75% waste separation by 2020. This ambition has been further substantiated into an aim to produce a maximum of 100 kg residual waste (household and bulky combined) per resident per year.
In the following years, VANG aims to reduce this amount even more significant by limiting it to 30 kg residual waste in 2025. By focussing on better waste separation and thereby reducing the residual waste, more resources can be recycled and less end up in landfills.

90% of all Dutch municipalities have embedded ambitions derived from the VANG program in their current policy. (VANG HHA, 2018). Different strategies such as implementing DIFTAR and Reverse Collection proof to be effective ways to reduce residual household waste of inhabitants. These strategies come down to letting residents pay waste charges according to the amount of residual waste they generate (DIFTAR) and increasing services around separated waste streams such as paper, organics and plastics (reverse collection).

Besides technological developments and governmental policies, the involvement of individuals is a crucial factor in this transition. Without the support and initiatives of citizens most technological and regulatory stimuli become useless (Sanders & Timmeren, 2018).

2. Resource Management in the BUCH

2.1 DEMOGRAPHICS BUCH

Only since 2017, the municipalities of Bergen, Uitgeest, Castricum and Heiloo have joined their forces for the sake of improving the quality of life of its residents and (cost)efficiency. Located in between Alkmaar and the coastline, the BUCH consists of multiple villages which arise out of green scenery, lakes, dunes and beaches. The coastal area is a popular beach resort among tourist.
A total of 101,000 people live within the four municipalities. This is equal to the size of Delft. Most residents (+ 30%) are between 45-65 years old (CBS, 2017) (Figure 5).
Uitgeest accommodates relatively the youngest population, while Bergen is more aged. The average income within the municipalities is slightly above the national average.

Figure 4 : Rightside of the Circular Economy Model of Ellen MacArthur Foundation

AGE DISTRIBUTION BERGEN UITGEEST CASTRICUM HEILOO (NH)
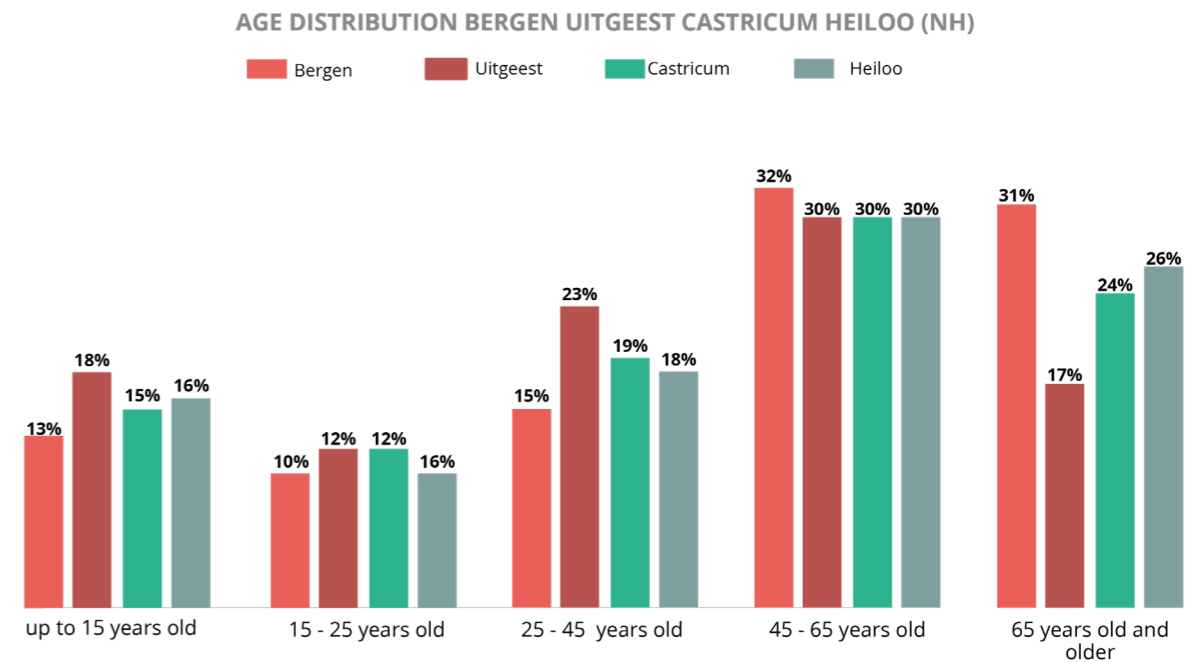
Figure 5 : Age Distribution Bergen Uitgeest Castricum Heiloo (CBS, 2017)

2.2 RAW MATERIALS POLICY

The BUCH municipalities recently (2019) updated their waste-management policy, which they will pursue until 2025. The new policy applies measures to make waste separation at home easier.
3 BUCH municipalities use a common collection service for waste. Only Bergen collaborates with an external party (HVC) which means that HVC is responsible for the waste collection.

In 2018 the BUCH set out a questionnaire among all residents, to gather input for the new raw material policy. The results of Castricum show that 89% of the respondents (total 1101) agreed that waste separation and the reuse of materials is important to highly important. (de Jonge Milieu Advies, 2018)

The questionnaire together with inspiration derived from the VANG program, lead to a new policy for raw materials. In the new policy, materials such as PMD(plastic, metal, drink cartons) and organic waste are collected at home on a regular basis and free from expenses. Less service applies to residual waste. This is collected less frequently and residents need to pay each time they roll the residual container outside, or throw in a garbage bag. Those who have little residual waste due to carefully separating materials will benefit from this by paying fewer waste charges. (Gemeente Castricum, 2019)

This policy can be held against the following model that balances out ambitions for expenses, environmental impact and services (Figure 6) For example, higher ambitions in the field of waste separation (environment) or in terms of services (convenience for the resident) have a negative impact on costs for citizens (NVRD, 2019)

The measures as stated in the new policy, require a behavioural change of
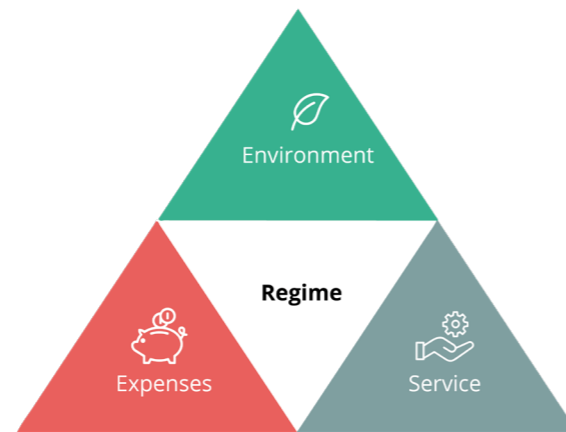
Figure 6 : Policy-making model for resource management

the residents. From now on, residents are expected to carefully separate their waste and they need to acknowledge its importance. In order to make this happen, the BUCH municipalities prepare a strategy that emphasizes a change in social norms; by showing that the majority is already doing it. By means of rewards, the BUCH aims to motivate residents to change their behaviour. The resistance will be reduced by acknowledging the situation, offering choices and making things simple. (Gemeente Castricum, 2019)

MUNICIPAL RECYCLING FACILITY

Bulky and chemical waste needs to be brought to the municipal recycling facility. In addition to paper, glass and plastic, the recycling facility also encompasses iron, cardboard, plasterboard, chemical waste, white goods, brown goods and more.

If you are not able to bring your bulky waste to the recycling facility, you can pay an amount of € 14 for the use of a collection service. The service is provided by the municipal recycling facility and picks up the goods for the recycling centre at people's homes. Previously, this service was free of charge but this has changed with the new policy. The

waste collected by means of this service was incinerated by default and therefore did not correspond with the new vision. Furthermore, the municipalities agreed that the truck was inefficient since it often drove all the way up to an address to collect only a few goods.
In the Castricum, this measure has led to 60% fewer bulk-waste collection requests. BUCH residents can discard their waste at the municipal recycling facility for free. (Gemeente Heiloo, 2019)

In an interview with Hans Tielen foreman of the municipal recycling centre in Heiloo, he explains that on a sunny Saturday around 600 cars visit the recycling centre. As foreman Tielen is responsible for staffing and has been around for 18 years now. Tielen and his colleagues assist and instruct visitors to discard their materials to the designated container. Refer to Appendix B2 for a summary of the interview.

According to Tielen, due to the relatively wealthy residents, some home products of fine quality are discarded at the recycling centre out of convenience. Over the past years, more and more waste streams are collected at the facility. Most fully loaded containers are collect by waste processor GP Groot. For some waste streams, the municipality pays to process them, such as wood and residual waste. Other waste streams such as scrap metal are bought up by GP Groot. In this case, the municipality earns money by selling 'clean' material streams.

In the past years, Tielen observed improved separation behaviour among people. Especially younger generations seem to understand the importance, Tielen elaborates. The recycling centre holds peak moments around spring clean-up and is more crowded on sunny days. On rainy days visitors tend to separate worse. Apparently, there are
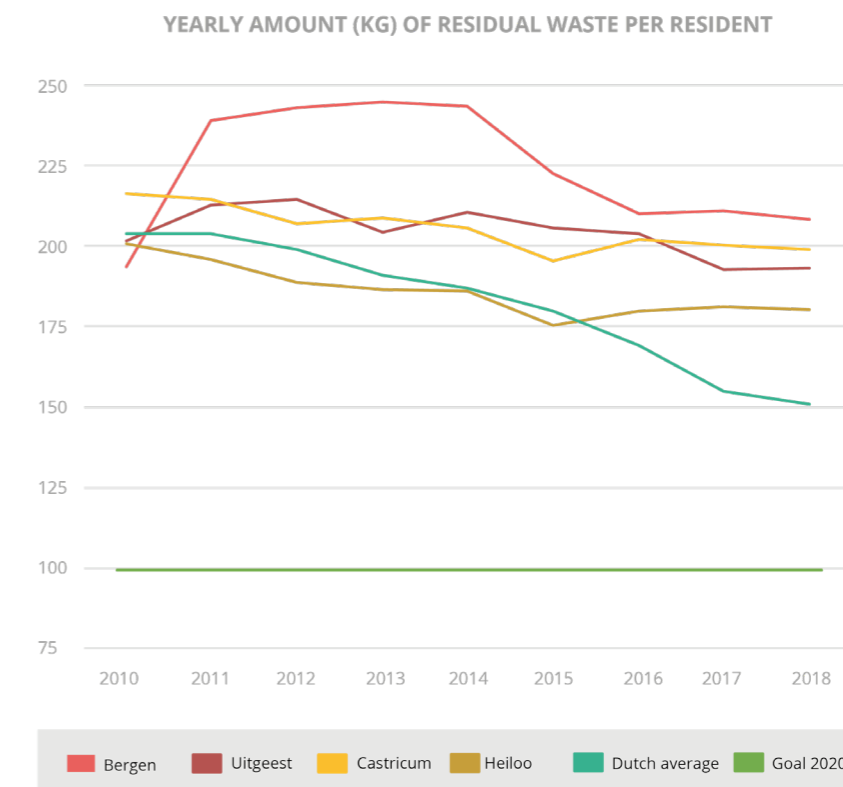
Figure 7 : Yearly mount of residual waste per resident CBS, 2018

also frequent visitors who just bring a small amount of cardboard or household plastic with some styrofoam. This can be an effect of the new policy where paper and plastic is collected only one time a month.

With the new policy, opening hours of the recycling facility extended and an employee constantly supervises the bulky waste bin to prevent raw materials from being wasted. The signage is updated to better instruct and inform residents.

By means of a new policy, the BUCH makes steps towards keeping up with the progress that is made in the rest of the Netherlands (Figure 7).

2.3 CIRCULAR CRAFT CENTRE THE BUCH

To limit the amount of yearly residual waste to 30 kg per person in 2025, municipalities also need to incorporate a new approach for residual bulk waste. Residual bulk waste is waste collected at the municipal recycling facility that ends up in the residual waste container. For the municipality of Heiloo, this amount is currently 32 kg per resident and transcends the Dutch average of 22 kg considerably. In the new policy, the

amount of residual bulk waste needs to be reduced to only 5 kg in 2025.
This can be achieved by applying multiple strategies. The BUCH was inspired by the concept of a circular craft centre that was proposed by Rijkswaterstaat. A circular centre is one central location where resources, products and waste is processed and reused within the municipality. It accommodates a thrift store, a repair cafe and a workshop underneath the same roof. In the summer of 2019, the Rijkswaterstaat ran a contest for municipalities to develop a well-thought-out plan for setting up a circular craft centre. The BUCH submitted a plan which differentiated itself by involving residents and its collaboration with TU Delft and the local Bonhoeffer college. This was awarded a subsidy for further development.

Prior to the competition, the municipality surveyed the preferences for a new recycling centre in the aforementioned questionnaire (de Jonge Milieu Advies, 2018). The results of Heiloo are shown in Figure 8.

Heiloo'ers (N= 686) find it most important that they can discard all waste streams at the collection facility. Protracted opening hours, close to home and with short waiting times are also important. Less important are a repair shop or

	very important (%)	important (%)	neutral (%)	unimportant (%)
Close to home	28	47	22	3
Extended opening hours	37	49	14	1
Repair shop on same location	10	22	41	27
Thrift store on same location	10	29	33	28
Short waiting time	22	53	21	4
Facilitates disposition of all waste streams	59	37	4	0
Lower containers so things can be tossed down	22	41	28	8
Borrowing a trailer	12	35	36	17
Borrowing a cargo bike	5	18	44	33

Figure 8 : Table obtained from survey conducted by de Jonge Milieu Advies;

thrift shop at the same location, or the possibility to borrow a cargo bike.
The results are somewhat surprising since no less than 91% of the same respondents consider better separation of waste and more reuse of raw materials to be important or very important. The municipalities of Castricum and Uitgeest show similar results.

2.4 CONCLUSION

The recent update of the resource policy of the BUCH sets sail towards the national ambition to reduce the annual amount of residual waste to 30 kg per person per year in 2025. By applying less service on residual waste, and more support on separated waste streams, the BUCH intents to reduce the amount of household waste significantly. In terms of household waste, de BUCH follows upon other municipalities who have successfully experiment with DIFTAR and reverse collection systems.

When looking at bulky residual waste, there is still much work to be done. Currently one person living in de BUCH discards on average 32 kg bulky residual waste. BUCH residents discard materials at the municipal recycling facility for free, and on sunny days around 600 cars visit the recycling facility. The ambition is to rebuild the recycling facility into a place that encourages reuse and repair of products instead of discarding them.

Prior to the new resource policy , the municipality surveyed the preferences for resource collection systems and asked about wishes for a new recycling facility.

The questionnaire reveals interesting insights. Even though 9/10 BUCH residents agree that waste separation and recycling is important, a circular centre is not something that seems to enthuse many.
When thinking of a municipal recycling

facility, accessibility and opening hours seems to be more important than circular activities.
From this it can be concluded, that people find it especially important that they can get rid of their products quickly and easily.
To understand the working of a circular craft centre and its effect on the reduction of bulky residual waste, one of the first circular craft centres in the Netherlands was visited.

3. Case Study: Circular Craft Centre Oss

3.1 AN INTERVIEW WITH LEO JANSSEN AND A TOUR

Duurzaamheidsplein (Sustainability Square) Oss is the first circular craft centre established in the Netherlands. It combines a thrift store, disassembly hall and municipal recycling facility.(Figure 9) It was opened in 2018 and is located at an industrial zone, on the outskirts of the city of Oss. Leo Janssen was interviewed, supervisor of *Duurzaamheidsplein* Oss. Afterwards, a tour was given by the managers of various departments.

The thrift store has been located right next to the municipal recycling facility since 1990. There has always been cooperation, but this intensive mutual one only started about two years ago. The municipality of Oss was planning on renovating the waste collection facility, and due to close contact with

the thrift store, they became part of the renovation plan. Leo mentions that the number of donations to the thrift store has increased by 30 - 40%. Also, the quality of the donated product has improved considerably.

Apart from being the supervisor of the *Duurzaamheidsplein*, Janssen also works for the municipality. This plan was initially set up to achieve the VANG objective. "We put the right heads together which quickly resulted in this idea".

Duurzaamheidspleins works together with e-waste collector WeCycle. In the disassembly hall, washing machines and other white goods are separated and returned to the e-waste recycling centre. Tabletops are separated from old tables and the long wooden selves are used to make new furniture for the city town hall. Leather and textiles from the brought in sofas are sold to a Moroccan company

to make decorative cushions. "By this means, we try to convert as many waste streams as possible into new products", explains Janssen.
Duurzaamheidsplein aims to keep the acquired materials within the local environment but European legislation around the sale of materials complicates this goal. Above a certain amount, you have to set out your offer to every European company, Leo explains.

A visit to *Duurzaamheidsplein* starts at a checkpoint near the entrance. Here, visitors are referred to the designated drop-off point by an operator. Are you carrying something that can be reused? The visitor is sent to the first drop-off point; the thrift store (Figure 12). In case of washing machines, leather sofas or scrap metal one is referred to the second drop-off point (Figure 10 & Figure 11).
Around 600 cars visit the facility every day. This requires a fast and smooth process flow. When arriving at the containers, almost one employee per container is spotted. The drop-off points are also occupied with at least two people. Most employees here have a certain distance from the labour market, explains Samantha, supervisor of the thrift store.

The thrift store is quite spacious, including an efficiently designed warehouse. Items that enter the warehouse via the drop-off point are directed to different departments; glassware and earthenware are checked for damage and rinsed in the dishwasher. Electronics are tested and, if necessary, repaired by an electrician. Bicycles are being refurbished and for clothing, a distinction is made between suitable for the store or of better use in developing countries. Furniture is checked for damages and stored in the centre of the warehouse. Everything that on closer inspection cannot be sold is passed on to the neighbours.

Figure 10 : Figure 7: Disassembly hall (scrap metal)

Figure 11 : Disassembly hall (scrap metal)

In the disassembly hall, a group of men are at work in the presence of some cheerful background music. The working atmosphere is pleasant, people have fun and regularly give each other a firm pat on the back. The fun comes first, explains the manager of the dismantling hall. We don't have a nine to five mentality. Materials such as scrap iron, textile, leather, concrete are obtained from discarded products and sold in large numbers to interested parties. Around the corner, a hallway is filled with huge bags with duvets, leather and other textiles.

The thrift store on the Maaskade in Oss is the only one in its area. The same holds for the bulky waste facility, meaning they have no competition from other stores or facilities.
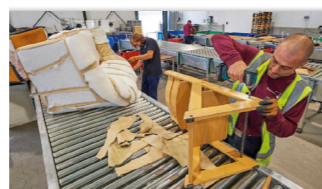
waste colletion   **disassembly hall**   **thrift store**

drop off disassembly hall

drop off thrift store

Entrance
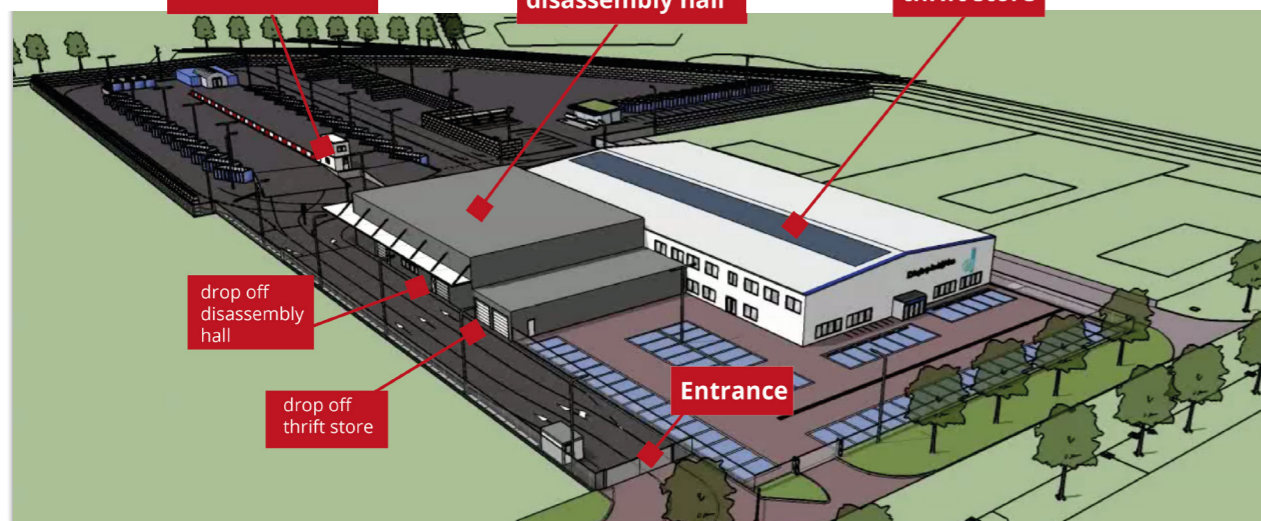
Figure 9 : Circular Craft Centre Oss: Overview

On the question, if the centre contributes to better waste separation and a more circular mindset in the heads of people, the answer is vague. Visitors just separate here since they have nowhere else to go with their old products. They are behaving more circular because they have to. Employees at every container ensure a careful separation process. The first 2 m³ of waste can be discarded for free at the *Duurzaamheidsplein*, some exceptions excluded.

The visit can be summarized in the following insights/observations:

· The drop-off point is hiding a lot of the disassembly process. The same holds for the thrift store drop-off point. People are not aware of what is happening to their products.

· It is likely that not all visitors are motivated to discard circular since there is no reward- or feedback system to acknowledge their behaviour. They are just instructed to discard in a certain way.

· A smooth collaboration between different parties is essential to make a circular centre work. There is mutual sympathy and a good relationship with the municipality.

CONCLUSION
A circular centre is an efficient way of organizing a sustainable waste collection system. It successfully combines sustainable and social business and sets an example of how a municipality can collaborate with new parties, like thrift stores.

In case of *Duurzaamheidsplein* in Oss, limited attention has been paid to involving residents in the discarding process. Residents are poorly educated or motivated to perform sustainable behaviour. The BUCH ambitions a

Figure 12 : Thrift store drop off point

Figure 13 :   Decorations inside the thriftstore

Figure 14 : Me in front of Duurzaamheidsplein Oss

circular craft centre as a place where circular awareness is raised and residents contribute to a local circular economy in more participatory ways.

In order to stimulate this participatory behaviour, it is important to first understand the principles that underlie

4. Behavioural Theories

Human behaviour is a complex phenomenon. The field of behavioural design studies how design can shape human behaviour by creating artefacts. This research has produced a range of theories, strategies and tools to design for a behavioural change.

This chapter looks into discarding behaviour and tries to identify the underlying principles that cause this behaviour. It elaborates on popular theories and strategies which are used to understand and influence our decision-making process.

4.1 DISPOSAL BEHAVIOUR

When decided to dispose of home products, people can make use of various disposal channels within and across categories of goods. Despite extensive research into the purchase and use of products, literature on disposal behaviour is still inconsistent and relates mainly to general household recycling or clothing. What is hipping to our home products and which factors influence our decision is left to research (Hibbert, Horne & Tagg, 2005).

What is known, is that furniture and home products have a relatively high environmental impact during extraction or production phases and that they are particularly suitable for reuse. One generally used channel for reuse are online platforms like *eBay* and *Marktplaats* where numerous home products are sold. A common reason for selling products is because products are replaced and/or became unnecessary overtime, but might still yield something. Appearance and reliability are common motives for replacing these types of products(Gullstrand Edbring et al, 2016). Other common disposal channels are

thrift stores, garage sales, giving to friends/family, or throw away. Events that prompt disposition(redecorating, purchase, and bereavement); the frequency of disposal; the tasks and logistics involved, all define the situation and therefore greatly influence the choice for disposition channel (Hibbert, Horne, Tagg, 2005). In order to generally explain our choices, the behaviour model developed by a social scientist BJ Fogg (2009) can be used.

4.2 FOGG'S BEHAVIOUR MODEL

Fogg's behaviour model (Figure 15) claims that behaviour can be explained by an interplay of three elements: motivation (do people want to do it), ability (can they do it) and triggers (are they provoked to do it).
Motivations can positively influence the desired behaviour, but can also negatively effect our behaviour (pleasure/pain). Anticipative motivations like hope or fear can make people perform a behaviour because they think it will benefit them in the future. The aim to be socially accepted or avoid social rejection greatly motivates people's in their daily choices.
Abilities can differ from person to person. Some tasks are easier for one person than holds for the other. Ability can be expressed in time, money and physical effort. Cognitive effort or social deviance can also refer to one's ability.
Lastly, triggers can be explained as something that pushes people to perform a behaviour. Fogg (2009) describes three sorts of triggers:

• **Sparks** strengthen the person's motivation for instance, by evoking a feeling of pleasure.
• **Facilitators** strengthen a person's ability. This means that the person is

already motivated, but is lacking the ability.

- **Signals** are triggers that work if a person is motivated and has the ability needed; they often serve only as a reminder.

Triggers have a higher chance of success when there is plenty of motivation and when it is easy to do so. However, if people really want to do something (high motivation), they are more likely to put some effort into it. The same can be said for the other way around; when it is really easy to do something, one can do it without having motivation to do it.

Fogg (2009) states that the moment when a motivation, an ability and a trigger unite, the behaviour will be performed. However, it is important to understand that there can be conflicting motivations or triggers in the environment of an individual.

Looking at *Duurzaamheidsplein* Oss, it is assumed that visitors are not motivated to donate their items to a thrift store or give them up for the disassembly. This because the experience of the donation does not attempt to be more pleasurable nor does it address anticipative motivations or social control. However, the effort it takes to perform circular behaviour is brought to a minimum,

which results in the desired behaviour anyway (Figure 15) (Fogg, 2009).

When looking at motivations for circular behaviour, some people seem just to do it because it feels right. Not because it immediately benefits their personal life, but because it will benefit our society as a whole in the future. In this case, people do not act upon personal concerns, but on social concerns.

4.3 SOCIAL STRATEGIES

Throughout our evolution, it is in human nature to be empathic and helping others without any direct individual gain as long as this has been beneficial to the survival of the group. Yet, when it comes to big groups (for example society) or estimating the long term consequences, it becomes easier to respond to personal and immediate benefits instead (Tromp, 2013). In these cases, it requires willpower to act altruistically, which can sometimes be too much on our cognitive plate. This lack of willpower lowers the ability to perform the behaviour, which causes a fall back into routines and focus on short term consequences.
One can argue that discarding home products is not part of our routine behaviour and that it requires some physical or cognitive effort to discard these products. It is hypothesised that in these cases, it requires so much

willpower, that there is not much left to care about the needs of others or our global sustainability concerns.

Luckily, products and services are a part of the external influences that play an important role in the movement towards a different behaviour (Tromp, 2013).People's willingness to change affects people's sensitivity to these external influences. Tromp introduces four different strategies to apply to products or services to influence people's behaviour. The strategies are usually presented in a framework which makes a distinction between the effect on the individual (weak or strong) and the manner in which the strategy is presented (implicit, explicit) (Figure 16).

DECISIVE
Decisive design is generally experienced as externally regulated. It is strong but implicit in its influence. People do not recognize this regulation as a deliberate decision of the designer. Examples are buildings without elevators to secure physical exercise or the limited lifetime of certain products.

COERCIVE
The public and institutional fields are commonly used for coercive design. Coercive design is strong and explicit in its influence. Coerced people are aware of the influence and experience this influence as something they are forced to do. The coercive influence is very restricting and it, therefore, requires the approval of the authority. An example of coercive designs is the speed bump.

PERSUASIVE
Persuasive design is weak, but the designed elements are recognized. Many interventions that use persuasion are health or safety-related issues, which are easily related to and accepted by individuals. In this case, it is easier to project collective concerns upon personal concerns and align the two. Examples of persuasive designs are

Figure 16 : Tromp's social strategies

healthcare warnings on cigarette boxes or sober driving campaigns. However, persuasive interventions can easily fail as soon as they concern behaviour that has long-term implications which collide with short-term concerns.

SEDUCTIVE
Seductive design is weak and the intentions of the designer are not recognised. Seductive influences can be useful when eliciting desired behaviour in situations that do not allow for enforcement or explicit arguments. Many social issues are constructed around collective concerns that are not directly caused by short term personal concerns. Explicit influences, in this case, might cause reactants which counters the desired behaviour. A seductive approach suits soft social problems where personal concerns are in conflict with collective concerns. An example of seductive design is a coffee machine which is positioned in the hallway to facilitate causal interactions between different departments.

The scope of this project addresses long term goals. Therefore a seductive design strategy seems like an appropriate tactic. Nonetheless, since it is still

Figure 15 : Foggs Behavioural Model

unclear what personal concerns arise when decluttering it cannot be stated that conflicting personal and collective concerns are present. Therefore, persuasive strategies might also be considered.

When looking at persuasive and seductive design strategies we enter fields of behavioural economics and heuristics.

4.4 BEYOND NUDGING

The persuasive and seductive design strategies described, encourage people to act upon social concerns. Within the behavioural economics discipline, similar tactics were found. Yet, they are focused on the individual behaviour and decision-making process. Research by Van Lieren, Calabretta and Schoormans (2018) has explored how behavioural economics can be applied in service design.

It is often assumed that people make outweighed decisions in daily situations; comparing the pros and cons and exploring possible alternatives fitting to the motivations and needs. However, this requires large amounts of cognitive power, as mentioned in the previous paragraph. Therefore, the intuitive, subconscious mindset is often times at work. The mind takes shortcuts to limited the required cognitive capacity. In behaviour economics these are named heuristics. Heuristics are universal and are strongly influenced by the environment we are in. Design interventions that play with behavioural heuristics are familiar under the name of nudges (Figure 17). These simple interventions make information or a particular behaviour easy, attractive or social and seduce people to perform it. Although nudges have been proven to be very useful, they are not always scalable, sustainable or suitable to apply in a complex context. Nudges are

designed to effect immediate behaviour in the present moment (Dholakia, 2016). In situations where people move across different touchpoints over different time spans, it is hard to predict behaviour and apply nudges successfully. A second limitation is that nudges can make customers lazy and inactive. People rely on their automatic, intuitive thinking which makes the performance of the behaviour almost unnoticed or unseen.

Van Lieren, Calabretta and Schoormans (2018), developed an approach to design interventions which go beyond a nudging effect. They conclude on applying a set of nudges and rational overrides across touchpoints of a customer journey. Rational overrides can be described as micro-moments of friction, which can be used to disrupt mindless automatic interactions. A moment of friction prompt moments of reflection and more conscious decision making.

This project will dive deeper into the steps people go through while decluttering and explores when moments of friction could be applied to prompt these moments of reflection and conscious decision making.

Figure 17 : A waste container with artificial grass and flowers in the Tarwewijk Rotterdam. It succesfully nudges people not to put rubbish next to the container. Image source: Municipality of Rotterdam

5. Participation

With a better understanding of how human behaviour works, and how it could be influenced, this chapter introduces a new angle of the project: participation . The chapter closes with summarising how environments can support participative behaviour based on literature knowledge.

5.1 THE PARTICIPATION SPECTRUM

Participation is a rather loose concept which incorporates different interpretations. Within a civil context, participation is often related to the involvement of residents in policy-making. The term concerns the different mechanisms for residents or interested parties to voice their opinions and exert influence concerning political, economic or social decisions that affect them (Aan de slag met de omgevingswet, n.d.).

Recently, the Dutch government established the Environment and Planning Act (de Omgevingswet), which mandates every local municipality to involve citizens in new projects by 2022. With this act Dutch government ambitions to increase the quality of

policies and decisions, strengthen local support and prevent unnecessary delays through objection procedures. The Environment and Planning Act gives the authorities as much freedom as possible to organize the participation process in their preferred way (Aan de slag met de omgevingswet, n.d.) This can be done in multiple forms: involving many or a few residents, for short or long term periods, facilitating online or on-site environments, little or great control over the final outcome etc. To keep it manageable for now, the different participatory mechanisms are categorised into so-called levels. These participation levels are defined based on the amount of impact that the public holds. (Figure 18).

One can see that at higher levels of participation, the power during the decision-making is equally distributed among all interested parties. It increases the influence of the public significantly by actively involving them in the development phase or even let them come up with a final solution themselves (collaborate/empower) (IAP2,2018). This is what is often-times referred to as co-creation or participatory design. At lower levels of participation, the plan/solution is already developed by the

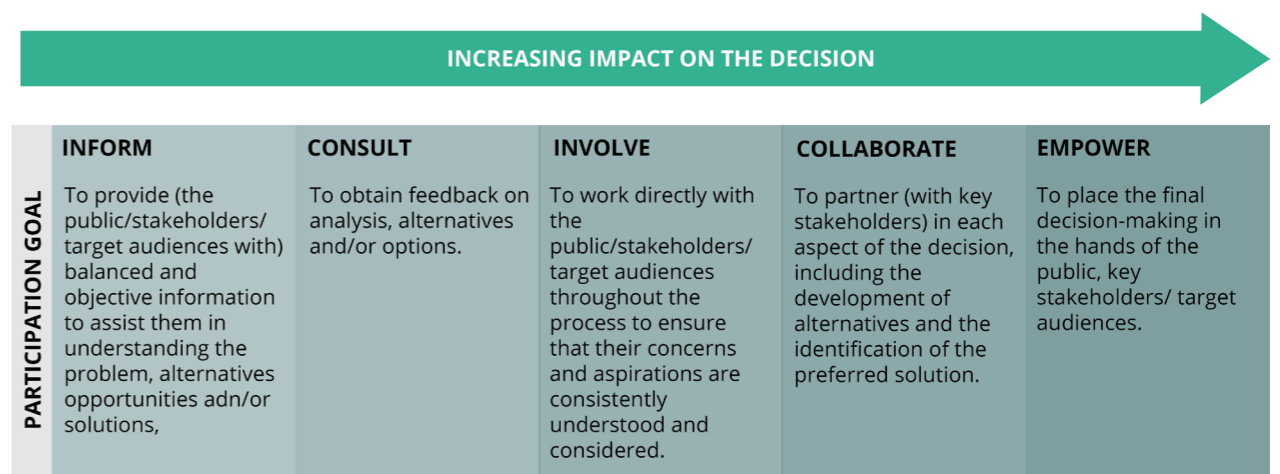|	INCREASING IMPACT ON THE DECISION →				
	INFORM	**CONSULT**	**INVOLVE**	**COLLABORATE**	**EMPOWER**
PARTICIPATION GOAL	To provide (the public/stakeholders/ target audiences with) balanced and objective information to assist them in understanding the problem, alternatives opportunities adn/or solutions,	To obtain feedback on analysis, alternatives and/or options.	To work directly with the public/stakeholders/ target audiences throughout the process to ensure that their concerns and aspirations are consistently understood and considered.	To partner (with key stakeholders) in each aspect of the decision, including the development of alternatives and the identification of the preferred solution.	To place the final decision-making in the hands of the public, key stakeholders/ target audiences.

Figure 18 : Participation Spectrum from International Association for Public Participation (IAP2, 2018)

authorities. Low-level participation simply informs or consults the public about new projects or policies by e.g. sending out a letter or a questionnaire.

5.2 PARTICIPATORY BEHAVIOUR

Within the scope of this project, the BUCH municipalities desire to explore the wishes of residents relating to circular (home) product disposal. These wishes will be integrated into the new design of the municipal recycling facility which is envisioned as a hotspot for the transition towards a local circular economy. To identify these residential wishes, a suitable participation strategy needs to be applied. Many believe that the most effective way of identifying residential needs is by empowering and collaborating with them right from the start of a project (Manzini, 2015, p.153) (Mulder & Loorbach, 2018, p.6). By means of this participatory design process, a mutual understanding and a shared vision for a circular craft centre can be formulated.

Of course, this is easier said than done. In the first place, the municipality need to acquisition a group of people who enthusiastic about these ideas and would like to get involved. Secondly, the envisioned circular centre will only be future proof when it corresponds with the needs of the residents which are likely to change over time. One can state that an addition to the envisioned circular craft centre derived from a co-creative session might not be enough. Ideally, residents should not only 'consume' circular services and facilities that are provided to them, but also feel empowered to adapt or 'produce' them. In this way, they shift from being consumers to contributors. In order to set-up a resilient local circular economy one needs to perceive it as an ongoing process which requires participative behaviour of a variety of people (Manzini, 2015, p.151). The municipality will mostly fulfil a facilitating role.

Of course, such participatory activities ask for time investments and a certain amount of motivation from the residents. This project aims to define the conditions which make participatory behaviour more likely to occur. It explores what needs to be designed to arouse contributions which can be used in the development of a local circular economy.

With the use of this infrastructure, the BUCH can move towards a more open-ended long term development-process where several people innovate together.

5.3 PARTICIPATION ROLES

As said before, participatory activities ask for time investments and a certain amount of motivations from the residents. Residents have different motivations for contributing to a local circular economy. To match these motivations, it is important to define distinct roles in a participatory system so that everyone can be a part of it. Of course, not everyone will participate, but people should at least have the opportunity when they want to. (Fischer, 2011)

Within cultures of participation, participants can generally be assigned to the following roles; consumers, contributors, collaborators, and meta-designers (Figure 19) (Fischer, 2011). Most participants will start as consumers: they will simply use a system designed for them. A small percentage will evolve into contributors: people who not only use but also enhance the system by means of contributions. Eventually just a small amount will collaborate or act as meta-designers and thereby will be responsible for the content and the infrastructure which is shared with everyone.

According to Fischer (2011), it is important that a sufficient number of

participants take on more active and demanding roles. Mechanisms need to be designed to encourage some people to transform from consumers to contributors to collaborators or eventually meta-designers. These mechanisms need to enhance involvement and motivation. Furthermore, they should offer participants additional knowledge which is required for the more demanding and involved roles.

5.4 PARTICIPATORY INFRASTRUCTURES IN DE BUCH

With this consulted literature about participation it becomes easier to identify and understand examples from practise. What can we learn from existing infrastructures? Some examples in de BUCH where found and will be briefly discussed.

IKDENKMEEOVERHEILOO.NL
On this website, the municipality of Heiloo offers the possibility to think along about future plans for Heiloo. By filling in statements and commenting on them, residents have the opportunity to participate in the policy-making

process. One can also register on the website for the residents' panel related to one of the projects. So far there are three ongoing projects presented on the website; climate, gas-free neighbourhoods and Levendig 't Loo (a lively shopping area). The resident panel "gas-free neighbourhoods" and some professionals have been invited to a resident-evening where the knowledge of residents about gas-free living has been evaluated and their wishes for the further participation process has been identified.
Under the heading climate on the website, residents can participate by completing a survey that researches which aspects of climate change people want to tackle. It is also possible to register for the residents panel.

A similar platform exists for Bergen, Uitgeest and Castricum. Within the participation spectrum, the website is mainly a way to *consult* residents. The panel operates on a slightly higher participation level, namely *involve*. In terms of roles, residents can be seen as consumers or contributors.
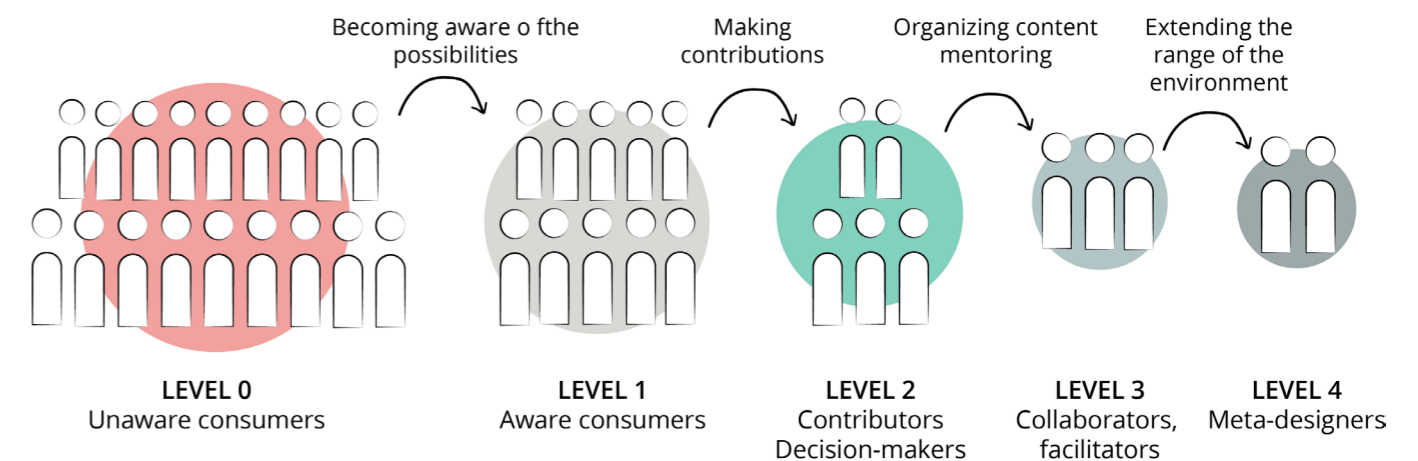
Figure 19 : Fishers(2011) roles in cultures of richer participation

LEVEL 0
Unaware consumers

LEVEL 1
Aware consumers

LEVEL 2
Contributors
Decision-makers

LEVEL 3
Collaborators,
facilitators

LEVEL 4
Meta-designers

Becoming aware o fthe possibilities

Making contributions

Organizing content mentoring

Extending the range of the environment

AREA DIRECTORS
Since the merge of the four municipalities, the BUCH organization has created the new position of area director (gebiedsregisseur). The area director is intended as a connector of the municipal board and the residents, with the aim of involving residents in municipal policy-making. The position of area director symbolizes the desire of the BUCH to tackle and implement citizen participation in a structured manner.

The area director is especially valuable in terms of knowledge of the village and his accessibility. A report by the Audit Committee of Bergen, Uitgeest, Castricum and Heiloo shows residents who have dealt with an area director were positive about them. The fact that the area director has visited them, spoke with them face to face and then took steps to investigate and solve their problem was appreciated (Kelders, Kriek, Timmerman, 2018).

Up until 2018, the area director was mainly deployed to solve very particular problems. In doing so, they mainly supported portfolio holders by talking to residents who felt affected by certain issues.
An area director can deliver more value in the future when they start operating more strategically. They must become the initiators of the participation policy and become more involved in the

Figure 20 : Interior of the Heiloo-Energie helpdesk in the shoppping mall

organization and implementation of major participation processes. (Kelders, Kriek, Timmerman, 2018).

Area-directors can be seen as a collaborators in Fishers' model (Figure 19). The municipality in this case, is the meta-designer. Residents could play different roles, depending on the chosen participation strategy.

HEILOO ENERGIE
Besides efforts of the municipality (top-down) to create proper infrastructures, resident also start to unite and organizations pop up (bottom-up); an example is Heiloo Energie. Heiloo Energie consults people about sustainable home renovations regarding isolation and solar panels, but also organizes thinktanks (denktanks) to reduce Heiloo's carbon footprint. Together with residents they think about locations within the area for windmills or solar panels.
The initiative consists of 100 members and has a prominent place in the shopping mall furnished as a help desk (Figure 20). By collaborating with residents, the municipality and entrepreneurs, the initiative works as a platform to collect sustainable knowledge.
They are also closely associated with another resident initiative: Duurzaam Heiloo. This is an entrepreneur network of local (small-scale) sustainable companies. Duurzaam Heiloo and Heiloo Energie share the space in the shopping mall and organize two yearly events together.
In Appendix B1 an interview with Ron Poppen from Heiloo Energie can be found which elaborates on the history and activities of this initiative. According to Poppen, the collaboration with the municipality could be improved. Due to changing policy officers and civil servants, communication does not work smoothly yet. "The municipality provides little feedback on decisions they make, while we do our best to provide solutions to

our sustainability problem."
Within Bergen, Uitgeest and Castricum similar resident organizations can be found. Most people who are part of to these initiatives are consumers or contributors. They participate through informing, consulting and involvement levels. Board members are the collaborators and meta-designers.

SMALLER SCALE INITIATIVES
Lastly, community centres (PostAanZee, Thuiskamer Egmond-Binnen, Trefpunt Heiloo) host all kinds of activities such as repair cafés, flea markets or walking tours. They give initiators room to execute their plans and organize events for the community. Community centres are mainly supported by volunteers and hardly depend on the municipality. They aim to create stronger social cohesion and networks that improve the overall well-being of the community. Volunteers and visitors usually play multiple roles in within these type of centres. Community centres are a oftentimes great examples of participatory ecologies.

Finally, there seems to be an active Facebook community where Heiloo'ers unite and share all sorts of information. Varying from a lost and found calls, to announcements of local events. Also, municipal measurements are discussed or criticized here (Figure 22). Various kinds of participation roles are present within the group, from just reading (consumers) to contributors (creating content and commenting) to facilitators(managing members and attracting new ones).

All in all, it can be concluded that there are various infrastructures present which have the potential to facilitate the development of a local circular economy. However, these infrastructures operate quite independently and the circular topic is poorly addressed.
Known is that bottom-up resident initiatives partnered by government

management can enable a new participatory environment, which is required for the envisioned transition (Mulder & Loorbach, 2018, p.6). It is worth exploring if there is an opportunity for design to enhance these existing infrastructures and connect them.

Figure 22 : Screenshot of Facebookgroup 'You are Heiloo'er when...' where a resident start a discussion on how they need to separate their household waste

5.5 ENCOURAGING PARTICIPATORY BEHAVIOUR

The studied literature and the examples from practice help to define the first lessons when aiming for participatory behaviour.

CREATE MULTIPLE ROLES

Fogg (2009) explains that in order to trigger a certain behaviour, we have to establish a situation in which people are motivated to do it; and where the ability is there to do it. In this case, this behaviour is defined as: participating in (the development of) a local circular economy. Acknowledging distinctive roles in a participative system creates the ability for people to participate according to their motivation. With the right mechanisms in place, a few members feel empowered enough to contribute on higher levels of the system.

WORK ACROSS VARIOUS TOUCHPOINTS

Behavioural heuristics can be a great source of inspiration to create a trigger that sparks one-time participatory behaviour. Reinforcement combinations over time and touchpoints can eventually make people adjust their behaviour in the long term (van Lieren et al., 2018) Ideally, these reinforcements cause a greater involvement in the system and might lead to participation on higher levels. What these reinforcements will be, is going to be specified in the upcoming chapters.

ADDRESS PERSONAL CONCERNS

When dealing with social issues, it is important that personal concerns are not obstructing social concerns (Tromp, 2013). Within the decluttering context, it is easier to act upon short-term personal concerns. Creating short-term personal advantages can be a suitable strategy to make people perform a behaviour.

SUPPORT FROM THE TOP

Make the contributions of residents as a result of their participative behaviour count. Within the new desired participatory system, bottom-up ideas meet top-down management. The role of the government is limited to a facilitating one. This approach is perceived as an effective one to transition towards a circular economy. Therefore, acknowledge and take resident contributions seriously. Currently, there are some infrastructures in place which could be used to engage people in the use and development of local initiatives. However, none of them addresses the topic of a circular economy yet. It is worth exploring if there is an opportunity for design to enhance and connect these existing infrastructures or whether this context requires a new mechanism.

START SMALL, GROW BIG

Even though this culture of participation seems complex, it starts small. Instead of attempting to build complete systems at design time, more wisely is to start with small participatory design activities between consumers and meta-designers. Through contributions of a large number of people, a larger culture can evolve over time (Fischer, 2011)

6 Conclusion

The Dutch ambition to become a circular economy by 2050 puts pressure on local governments, like the BUCH. Discarded resources in their municipalities need to be treated with great care to enable remanufacturing and recycling. Even better is to stimulate repair or reuse of products and extend their lifetime. However, all starts at the individual level and requires an inevitable behavioural change. Instead of linear consumption, the world asks for circular consumption models.

Since 2016 Dutch municipalities are updating their resource policies to get there. Looking at the average drop in national residual waste, the BUCH is lagging. A new raw materials policy was drawn up in 2019, were increased service was applied on separated waste streams and less on residual waste streams. Other municipalities have shown that through this policy approach, the amount of residual waste will decrease sharply and the separation rate increases.

Residual bulky waste which is disposed at the municipal recycling centre is also part of the residual waste and needs to be reduced from an annual 32 kg (as measured in Heiloo 2019) to 5 kg by 2025. In order to achieve this, BUCH is planning to upgrade its municipal recycling facility into a circular craft centre. By bringing a thrift store and a craft studio on the same location, they hope to reduce the amount of residual bulky waste and become an inspiring place for reuse. The centre needs to become an instrument to stimulate a local circular economy.

The example of circular craft centre Oss proofs that the concept invented by Rijkswaterstaat reduces bulky residual waste. However, the participation of residents cannot be taken for granted. Making it equally easy to donate while discarding products, does not naturally result in a more circular mindset, nor does it generate resident engagement.

The BUCH desires to change linear perspectives with their circular craft centre which is supported by and established with residents. This requires participatory behaviour from the residents. To encourage this behaviour, motivated people should be reached by improving ability (making it easier) to contribute. By establishing different roles which fit the different type of motivation, various people will feel able to contribute. A seductive or persuasive design strategy is assumed to be most effective to spark first time-behaviour. Combinations of reinforcement over time and across different touchpoints can eventually make residents participate on higher levels and adjust their behaviour on the long term. To get people on board, it is important to meet short-term personal concerns while addressing long-term goals. Lastly, it is important that bottom-up resident innovations are supported by top-down institutions in order to transition towards a circular economy. It is important that the contributions of residents are taken seriously.

Now it is time to dive into the perspective of the residents. Who are the people living in the BUCH and how does product discarding currently look like.

02
EMPATHIZE

With a better understanding of the definitions and the resource management systems in place, it becomes easier to put yourself in the shoes of the residents. Within this sub-section a variety of design research methods was used to learn about the behaviour of residents. Motives, barriers and enables for residents to contribute to a local circular economy were identified.

1. Research Outline

1.1 APPROACH

So far, the current waste management system and the principle of a circular centre are explained. Literature on behavioural design and participation has been consulted and the first guidelines to stimulate participatory behaviour has been drawn up.

Still, knowledge concerning the attitude of residents towards the resource problem is lacking. During this empathizing phase, a deeper understanding of the needs, wishes and values of residents is regarding disposal is gathered. Different design research methods are used to obtain this knowledge.

QUESTIONS
To address this knowledge gap multiple questions need to be answered:

1. How do people currently dispose of their products? What situational factors have influence?

2. What withholds residents from participating in a local circular economy?

3. How does their disposal behaviour relate to others within their community?

RESEARCH GOAL
The goal of this research is to answer the research questions stated above, to formulate a design statement and by doing so, identifying the most promising areas for further ideation.

PARTICIPANTS
Various people participated in the research of this project including

residents, BUCH agents and officers. Out of preference from the BUCH, there was a focus on people living in Heiloo.

In total, over 40 residents are interviewed about their discarding decisions and over 80 residents shared the procedure of their recent declutter experience via an online survey. Four residents contributed in a more in-depth interview during this phase.

1.2 METHODS

Different methods are used during this research. They are shortly explained below.

OBSERVATIONS
On March 3rd observations were done at the municipal recycling facility in Heiloo and in the nearby local thrift store. Attention was paid to types of products that were disposed of, the interactions that occur on the recycling facility and the behaviour of visitors.

GUERRILLA INTERVIEWS
40 on-the-spot interviews of approximately 5 minutes are done with residents visiting their supermarket on a Thursday afternoon. The attention of the passersby was obtained by placing old products on a table, asking them how they would discard them.

IN DEPTH-INTERVIEWS
Four in-depth Skype interviews of 30 to 45 minutes were done with BUCH residents, who are used to selling and buying items via online platforms such as Marktplaats or Facebook. The questions asked are documented in the appendix B4. The interviews are summarized and insights are clustered and added to the results of the Guerilla interviews.

ONLINE QUESTIONNAIRE

Over 80 residents filled in a survey concerning the procedure of their recent declutter experience and their disposal behaviour in general. It took about 6 minutes to complete the questionnaire. The questionnaire also included some statements to test the presence of a circular mindset. The questionnaire was designed in an engaging way to recruit participants for the next steps of this project.

Every part of the research will be further explained in the next chapter. Each chapter will start by explaining the approach of the research and eventually showing the results of these activities. The results are summarized in insight-cards, which can be found in Appendix C1.

2. Research Activities

2.1 OBSERVATIONS IN CONTEXT

Observing people in their world provides the opportunity to empathize with the experience of residents and understand their context and its surroundings. Observations and a talk with 9 visitors on a Tuesday afternoon formed the first impression. The goal of these observations was to see what products are disposed of at the recycling facility, what events prompt a visit and get an impression of the people living in de BUCH.

Additionally, by infiltrating in various local Facebook-groups concerning product reuse (selling or give away), various trading interactions are observed over time. These observations helped to gain new insights, as well as confirming assumptions that were gathered along the way.

RESULTS

The observational research uncovered that some people visit the municipal

Figure 23 : Content of the bulky residual waste container

Figure 25 : Advertisment for a leaf blower; Obtained via this group, but is rarely used so passing it on again.

Figure 24 : Advertisment for 6 dining chairs; Free to take.Otherwise they are discarded as bulky waste.

recycling centre on a very regular basis to discard general household waste, such as paper or plastics.
Bigger products are most of the time already disassembled, for the sake of transport. A few people even separate their products on the basis of the type of waste stream at home.
Once at the recycling facility people are rushing around and have little interactions with the municipal staff members.

The quality of the second-hand items which are offered via Facebook is quite good. Various people respond to the items. Often times, there is a certain time-limit given in the description.

2.2 EXPERT INTERVIEWS

Hans Tielen, supervisor of the municipal recycling facility in Heiloo, was interviewed to derive a first perspective on how people behave a the municipal recycling facility. The interview can be found in Appendix B2. Talking to experts in the beginning phase of the project is a efficient and concentrated way to collect data and can safe a lot of time.

Groen, who temporarily holds the position of area director (Gebieds regisseur) Heiloo, was interviewed to see how she looks upon the plans of a circular craft centre. How does she think Heiloo'ers would respond to this? What distinguishes a Heiloo'er from another BUCH resident? How could we engage people in our resource problem? A summary of the interview can be found in Appendix B4.

RESULTS
The recycling facility is a popular destination during the 'declutter' season, or spring clean-up. On a busy Saturday, around 600 cars visit the recycling centre.
On rainy days, this amount is less and people tend to separate their waste

worse.

Most Heiloo'ers aren't born and raised in the village. Many have lived in Amsterdam or other cities nearby, and have moved to Heiloo for the space and natural environment. Many of them are still commuting everyday to bigger cities like Alkmaar, Amsterdam or Haarlem.

According to Groen, the Repair Cafes does not have the attention of many residents. Also circular events organized by the municipality or by Duurzaam Heiloo are not particularly crowded.

2.3 GUERILLA INTERVIEWS 'T LOO HEILOO

Guerrilla interviewing is a fast and low-cost way to gain sufficient insights to make informed decisions. Guerilla interviews take place in a public place and the interviewer approaches passer-by to gather their opinion on something. In the case of this project, an intervention was done inside the shopping mall 't Loo in Heiloo on a Thursday afternoon.

A table with used products was placed inside the mall, accompanied by a large sign saying: What would you do with this product? The products were presented with a small description (Figure 26).

Figure 26 : Set-up of the intervention

The microwave had a defect light, the old desk lamp became out of trend, and the laundry basket had been replaced by a more convenient model. Attendants could make their choice of disposition channel known by placing stickers on the product (Figure 28). Each sticker represented another action (bringing to the municipal recycling facility, repairing, thrift store etc.) People were asked to elaborate on their choices. Simultaneously, notes where made on a designated form, to capture their thoughts quickly.
The goal of these interviews was to identify users of different disposition channels within the municipality and understand if the type of product affects this choice. 43 people participated in the guerilla interviews.

RESULTS
The guerilla interviews learnt that there were different ways to deal with the products. Most people considered one alternative option before discarding it at the municipal recycling facility. In most cases this was asking friends/family/neighbours if they could use it. Another commonly mentioned alternative was the thrift store, or trying to repair it.
There was also a significant group who would just store the items in the shed or in the attic. They thought it might come in handy later.

The information derived from the forms was translated into quotes. The quotes were clustered into behavioural categories (Figure 29). These in the end formed the first draft of personas, which are presented in the second chapter of the define section.

2.4 IN-DEPTH SKYPE INTERVIEWS

In order to empathize with people using Facebook or Marktplaats to dispose of their used products, interviews were

Figure 27 : Guerilla interviewing

Figure 28 : Passerby making a selection using stickers

Figure 29 : Quotes & Catagories

conducted with four people of which two living in Heiloo, and the other two in Castricum and Alkmaar. The goal of these interviews was to understand the needs and wishes surrounding the context of product disposition. What can be improved in the current experience?

In order to gain a rich understanding of people's experiences, participants were interviewed according to a technique to explore their ideal future experience by reflecting on the current situation as well as past experiences . To let people imagine future product discarding it is important to provide them with space that they can use to show or tell about ideas about future scenarios (Sanders & Stappers, 2012) This framework that can be used to explore the present, past and future experience is called the path of expression (Figure 30).

All participants made use of online trade platforms for both selling and buying items. During the interviews, the interviewees were first asked about their recent declutter and/or product disposal experience. Thereafter, memories about earlier selling- or second-hand buying experiences were recalled. Some participants retrieved memories form their childhood while others referred back to only a year ago. This sharing of experiences helps the participants to access underlying needs, wishes and values, which serve as the basis for exploring their ideas for future product discarding.

Finally, the interviewees were asked to elaborate on their ideal future product disposal experience. The use of the path of expression helps to connect people to meaningful experiences and use it as a way to ideate about the future.

An detailed version of the interview can be found in Appendix B4.

Figure 30 : Path of expression by Sanders & Stappers 2014

RESULTS

Lotte explained she would like to see the future as how things were 40 years ago. She misses social cohesion and the times when you could always rely on your neighbours. You shared and borrowed something more often, instead of buying it yourself.

Lynn's ideal way of discarding is by passing on, but in a more efficient way. She thinks it can be quite a hassle to make appointments with people and to actually seal the deal.

Kees feels comfortable with the way things go now, but he hopes that in the future more people will open their eyes and see that they could help others with good quality products that are otherwise dusting for ages.

Jelleke envisions a future in which we exchange items more frequently, without intermediate or commercial parties. Resident to resident!

Lotte (57 years)
Alkmaar
Owner of STOER:
A social venture in Alkmaar

"While daily scrolling through Facebook I encounter so many nice products and I know enough people who could use something like that"

Lyn (31 years)
Heiloo
ICT Consultant, living by herself

" My house is full of second hand products. In the last couple years, I am saving up for some pretty things and sell the replaced items on Facebook or Marktplaats. I have plenty of space to store them for a while. "

Kees (68 years)
Heiloo
Retired living with his wife

"I sold and gave away a lot of my son's things when he left for Spain. They were too good to discard.

I haven't had bad experiences so far. But I also try to avoid them by, for example, not selling a car or smartphone at my door."

Jelleke (57 years)
Castricum
Mother of two kids, currently unemployed

" If I have read a couple books, I put them in the hallway so to speak. And when people are visiting or because I know that people like to read it, I pass it on."

Figure 31 : Statements of the interviewed participants

2.5 ONLINE SURVEY

The insight from the in-depth interviews about the declutter or clean-up rages sparked some personal interest. Also, the increasing amount of visitors to the municipal recycling facility showed it was clean-up time. How is the circular mindset present in this situation?

An online survey was designed which could be completed from a distance. An advantage of online surveys is that people can fill it in in their own time and think about their answers at their own pace. Since it is completely anonymous, participants are likely to answer more honestly. However, one should be careful with open-ended questions because there is no interviewer to clarify the answers of the respondents.

To ensure that people not only completed the survey but also left their e-mail address for further research, the design of the survey should be engaging. Therefore, simple speaking language was used and the tone of the question was rather energetic. Illustrations were added

to make it even more fun. This ensured that the questions could be quickly and easily answered and that 18 people left their e-mail address.

The link to the survey was shared via local Facebook pages and contacts within the municipality. Groen (area director) spread it within her circles, and sports associations, neighbourhood centres and primary schools were emailed with the question if they could share it among their members.

The survey consists of 15 questions regarding recent and general discarding behaviour. At the end of the survey five statements about circular behaviour are presented and rated on a Likert scale. This, to test the mindset people have towards circular product use and disposition.

82 respondents completed the survey. The results are presented on the next page.

RESULTS

The results show that the municipal recycling facility is frequently visited place. During recent declutter/redecorate projects it is the most visited location (Figure 33). Over 70% of the respondents visit the facility more than four times a year (Figure 34). Nearly half of the people visit a thrift store this often. Online marketplaces seem to be more popular, 62% of the people visit them more than four times a year.

Figure 33 : Which places have you been visiting during your last declutter/redecorating project (multiple answers possible)

Figure 34 : How often do you visit the municipal recycling facility? Most given answer: 4 times a year

Opgeknapt en opgeruimd, dat staat netjes!

In deze vreemde tijd waarin we veel thuis zijn, waait er een frisse wind door onze huizen. Nieuwe klusprojecten worden gestart en oude rommel wordt opgeruimd.

Voor mijn MSc afstudeerscriptie aan de TU Delft (Industrieel Ontwerpen) doe ik onderzoek naar opruim-gedrag en gewoontes. In samenwerking met de BUCH gemeenten probeer ik een nieuw concept te ontwikkelen dat inspeelt op deze gewoontes. Door middel van 20 vragen probeer ik achter uw opruim gewoontes te komen.

Natuurlijk! press **Enter** ↵

Figure 32 : Landing page of the the survey

8 Waarom brengt u spullen naar de milieustraat?

82 out of 82 people answered this question (with multiple choice)

70.7%	Kapot	**58** responses
51.2%	Beschadigd	**42** responses
30.5%	Overbodig	**25** responses
30.5%	Verouderd	**25** responses
29.3%	Dat is duurzaam	**24** responses
24.4%	Levert niks meer op	**20** responses
19.5%	Vies	**16** responses
18.3%	Incompleet	**15** responses
15.9%	Ik weet niet waar ik het anders mag inleveren	**13** responses
14.6%	Dat is makkelijk	**12** responses
1.2%	Niet mijn smaak	**1** response
6.1%	Other	**5** responses

Figure 35 : Why do you bring items to the municipal recycling facility? Most given answers: broken, damaged and dispensable.

19 Ik probeer kapotte of beschadigde spullen op te lappen. Avg. 4.1

82 out of 82 people answered this question

1	2	3	4	5	6	7
8.5%	8.5%	18.3%	23.2%	19.5%	12.2%	9.8%

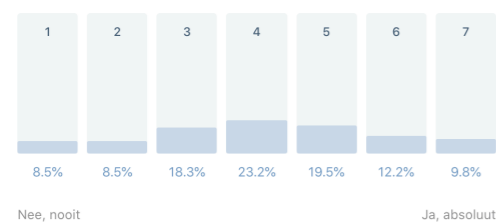Nee, nooit   Ja, absoluut

Figure 36 : I try to fix my broken or damaged items. Left: No never, Right: Yes, absolutely. Average 4.1

Most items that people bring to the municipal recycling facility are either broken, damaged or dispensable (Figure 35).
More than 70% of the respondents say they often consider other alternatives before discarding at the municipal recycling centre. Another question indicates that 36% rarely or never try to repair broken or damaged items (Figure 36). Most people seem to only repair their items from time to time.

When it comes to values during product disposal, it seems that the social responsible aspect is valued the highest. Respondents were asked to arrange *Social Responsibility*, *Sustainability* and *Convenience* according to their importance during home product discarding. The terms were previously explained to them as:
1. Social Responsibility: Supporting people who are in need
2. Sustainability: With as little loss of resources as possible.
3. Convenience: Quick and with little effort

Social Responsibility, and *Sustainability* seem to be the two most important aspects, while Convenience scored surprisingly lower.

The full results of the survey, including some demographical data of the respondents, can be found in Appendix B5.

3. Conclusion

1. **What does the current context of product disposal look like?**

    Discarding products usually happens in complex situations. People are moving, decluttering, redecorating or because of a bereavement.
    The municipal recycling facility is a commonly visited place in these situations. Also construction markets and online Marketplaces play a role in most situations.

    At the beginning of the spring, during some Holidays people take time for decluttering or redecoration projects. This sometimes brings the amount of daily visitors of the municipal recycling centre to 600 cars.

    A regular discarding journey takes around 2-5 days from start to end.

2. **How is the circular mindset present during product disposal?**

    There was found a variation between how people look upon the circular problem and how they discard their products.

    Products which are damaged or broken are usually quickly discarded. In other cases most people admit that they (shortly) consider other possibilities before they discard at the municipal recycling facility.

    Others see the recycle facility as a very sustainable alternative. They believe they are doing a good job since they do not dump it in the environment or try to put it with the general household waste.

    Thrift stores or online Marketplaces

    are mostly considered because of the social motives, rather than sustainable motives.

3. **What currently withholds residents from circular product use?**

    Some products are just of low quality or do not have value in the eyes of the owner anymore. It does not make sense to put effort in the disposal of this product.

    When products are dirty or broken they have lost their value for most people.

    Bad experiences with Marktplaats or thrift stores results in a discouragement of circular actions.

    Lastly, repairing products is hard and spare parts are usually more expensive than buying new.Dicarding at the recycle facility is easy and for free.

4. **How does their disposal behaviour relate to others within their community?**

    During the in-depth interviews, several people pointed out that when you are raised with second hand goods it makes you think about your products twice before you discard them.

    Currently there is not a cohesive system for product reuse in the municipality. However, the Facebook group seems to be succesfull tool for local reuse.
    People are not used to lending out their products.

III.
DEFINE

The previous research phase has yielded all sorts of information about the context. In this chapter, the relevant information is clustered and presented in the form of personas, a behavioural journey, a stakeholder map and a design statement. This design statement will function as a starting point of the developing phase of the project.

© Marc Schols (2018) Naar het milieupark? Leen gratis een aanhangwagen! Beeg.nl [Photo]

1. Motivations, Barriers and Enablers

During the empathizing phase, different motivations, barriers and enablers for circular behaviour came to the front. Also, some general findings of the declutter process were obtained. All together, they form the insights, which are presented in the form of insights cards. All insight cards can be found in Appendix C1.

This chapter sums up the motivations, barriers and enablers that are present in the declutter context.

1.1 MOTIVATIONS
(why do they want to discard it like that?

or not?)

PLEASURE/PAIN
- Products that annoy people, are standing in the way (pain).
- Pleasant social interactions with personal product stories make selling and buying fun to do (pleasure)
- It is a shame to throw a valuable thing away (pain).

HOPE/FEAR
- An organized home clears the mind (hope)
- Someone might be still willing to use it (hope)
- When selling a product, it might still yield something (hope).
- Unpleasant social interactions (fear)
- Nobody is interested in my product. (fear)
- It might still come in handy at some point (fear).

SOCIAL ACCEPTANCE/REJECTION
- Most people are raised with certain values and are used to selling or buying second hand.
- Wanting to support another who can use it

- Wanting to preserve the environment

1.2 BARRIERS
What prevents them from doing it like that?

TIME
- Selling/Giving away items takes more time than discarding at the recycling facility
- People have the feeling they have little time during declutter/redecorate since it is usually a very planned activity.
- Decluttering usually requires a day off.

MONEY
- When the product is of little value most people do not find it worth the effort to discard it responsibly.

PHYSICAL EFFORT
- It requires additional effort to take pictures, advertise your product and arrange a pick-up date.
- It takes additional effort to go around several disposal channels.
- It takes additional effort to disassemble the product

COGNITIVE EFFORT
- It requires a plan to organize a declutter day.
- Selecting which products to keep and discard is a tiring activity
.
OTHERS
- Rainy day
- Lack of tools / equipment
- Lack of knowledge about reuse/ recycling

1.3 ENABLERS
What allows them to do it?

TIME
- Days off between Easter and Whit Sunday

MONEY
- Discarding at the recycling facility is free.

EFFORT SAVERS
- It requires less effort to let someone pick up the item at your house than to transport it to the recycling facility.
- It takes little effort to drop off your items at the thrift store.
- Due to daily interactions with Facebook it requires less effort for people to share something on it.
- Facebook groups are directed at local trading and are perceived as trustworthy.
- Facebook or Marktplaats enables people to spread their advertisement rapidly.

OTHERS
- You could rent a trailer at the recycling facility.

2. Personas

The data derived from the previous phase gave insight into the various ways of discarding. It shows that the choice of disposition channel is based on several situational factors and personal values. Situations that trigger disposition like; bereavement; moving, or home improvement can require much cognitive power which leads to more convenient disposition choices. Motivations and capabilities of an individual, together with product qualities, determine the choice considerably. What is easy for one may not be convenient for another.
Based on motivations and capabilities, six personas are created. Personas are archetypal representations of intended users, describing a visualising their behaviour, value and needs (van Boeijen et al., 2014, pp. 94–95). They will be shortly explained in this chapter.

2.1 SIX PERSONAS EXPLAINED

CLUTTERER
For a clutterer it is incredibly difficult to discard a product. Various replaced or unnecessary products are dusting in the attic or in the garden shed. Objects quickly acquire a sentimental value to the clutterer which makes it harder to dispose of them. Other objects are kept because they might come in handy at a certain point. This can be seen as an economic motive, where discarding feels like losing possession. Additionally, the clutterer can be insecure where products can be discarded and therefore decides to just keep them for a while until they find someone who can use it. When they encounter someone who could use it, they are very willing to give away or sell their old products.
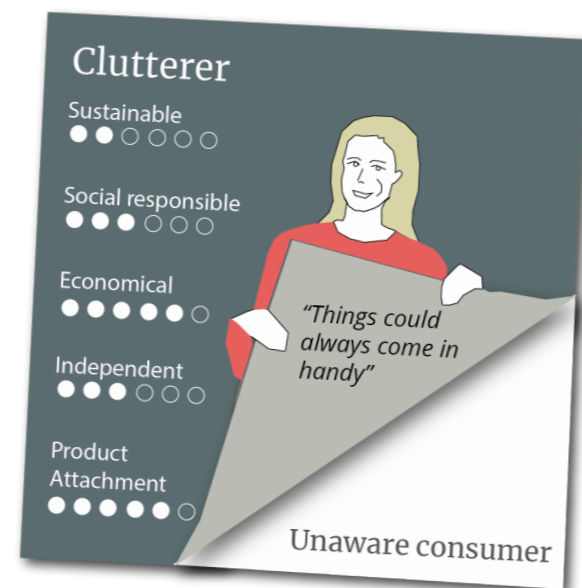
" I am saving it for my grandchildern"

BIN FILLER
Bin fillers generally feel less attached to the products they replace. They are more trend sensitive and rarely buy second-hand. Bin-fillers are generally convinced that bringing items to the municipal recycling facility is a very sustainable way of product discarding. As they are less familiar with thrift stores or a second-hand platform such as Marktplaats, they seldom seriously consider these alternatives. Especially if their products have no significant value to them anymore. They like certainty and independence during the clean-up or redecorating process. They might ask around friends or family, but most items end up at the municipal recycling facility, a special container or together with the household waste. They are less connected to the less fortuned within the area.

THRIFT THROWER
Thrift throwers think it is a shame to dispose of products which can still be used, however, they do not like to advertise them. Unpleasant experiences with Marktplaats or other sales channels make them donate their things to a thrift store. The hassle of making appointments and agreements with strangers is the most common thing that withholds people from directly passing on to others. In situations like a bereavement, a lot of furniture is brought to a thrift store. Relatives do not ambition earning money with the furniture and look for a convenient way to get rid of them. Since most items are too good to let go, they are donated. Items such as games, clothing, books and music are commonly given to a thrift store.
Thrift throwers, desire to quickly get rid of things just like bin fillers. However, sustainable, economic and social responsibility aspects are considered. The thrift store is in that sense, a convenient go-to for your old items. The pitfall is only that too much stuff is brought, and items are not carefully

"I don't know what else to do with that junk."

"Selling is such a hassle."

selected for reuse. This results in the donation of products that the thrift store can no longer sell because of damage, malfunction or hygiene. Thrift throwers can be thrift shoppers, but this does not have to be the case.
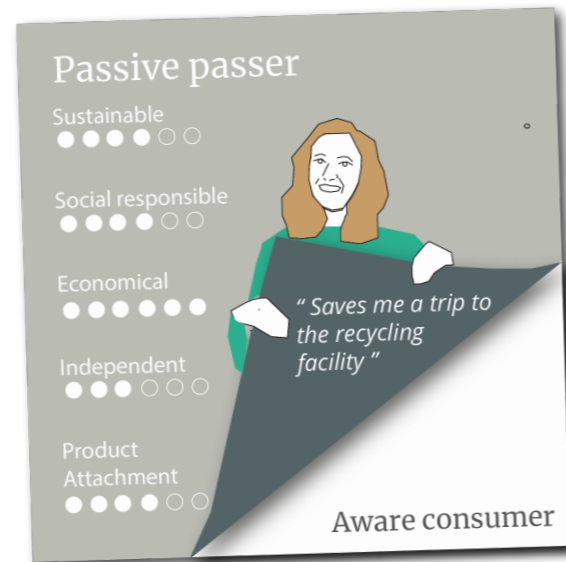
PASSIVE PASSER
Passive passers relate to thrift throwers in a sense that they have social, economic or sustainable motives to sell or give away items to others. Yet, for most passive passers, it is also a way to safe a trip to the municipal recycling centre. The fact that someone comes by to pick up their items, makes this way of discarding very convenient to them. Passive passers like to offer their things to others, without the intervention of a third party like a thrift store. These type of passers are often also second-hand buyers or have been in the past. They prefer the transaction to be quick and with minimum effort. The price of the products they offer is relatively low in order to make sell it quickly. Quite often, these type of products are relatively large in size or heavy. Passive passers tend to buy new in the first place.
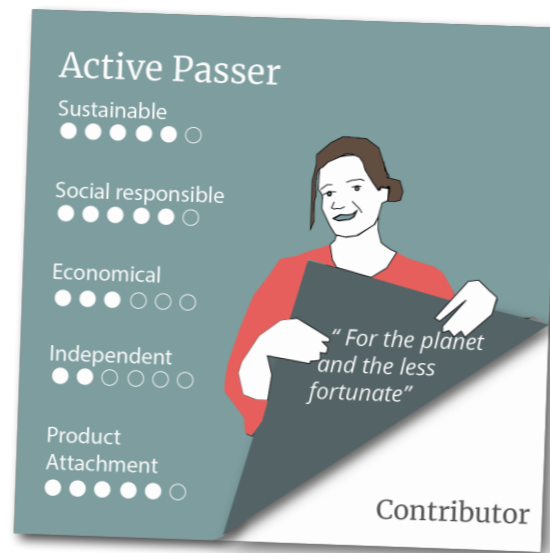
ACTIVE PASSER
Active passers are people with a great moral sense and care about the environment. They treat their products with care although over time some become unnecessary. These products are too good to discard, so active passer considers how they would like to pass it on. They categorize items for friends, thrift store and to sell but also consider other local organizations like community centres or daycare.
An effort is made taking good photo's of the products and adding an explanatory description. Active passers try to think along with their buyers and like to connect with them a little. Sometimes this leads to providing some extra service like giving a demo, or offering some additional items. They ensure that their belongings are clean and ready to

"I do have an address where I can usually lose it, otherwise I will discard it."

" A small effort for me; a big gesture for others"

be used by somebody else.
Active passers like to buy durable goods, whether this is first- or second hand.

VALUE SEEKERS
The value seekers are the creative minds, trying finding ways to repair or revive things that are not used anymore. Value seekers are handy and like to scour the internet for DIY or repair videos in their free time. They are involved in local activities and have found a way to connect to the less fortunate in the area. There is always someone they know who can use their disposed belongings. They get a lot of energy from giving and making others happy.
Value seekers are frequent visitors of thrift stores and Marktplaats. They like unique items with a story. Value seekers organize clothing swaps for friends; like to use instead of own and attend various circular events like repair cafés and flea markets.

2.2 POTENTIAL ROLES WITH A CIRCULAR PARTICIPATORY MUNICIPALITY

To understand how these personas can work together in a circular participatory municipality, Fischer's model for ecologies of participation can be held against it. The identified personas are placed within the theory framework according to their motivations (Figure 37). Currently, most of the people are still behaving like bin fillers, passive passers or thrift throwers. They participate at lower levels of the participation spectrum. The ones at higher levels of participation are poorly visible from the outside since they operate quite individually.
In order to create a participatory system, the different actors should work together in the same environment. The environment should facilitate collaborations and should encourage a behaviour change towards higher levels
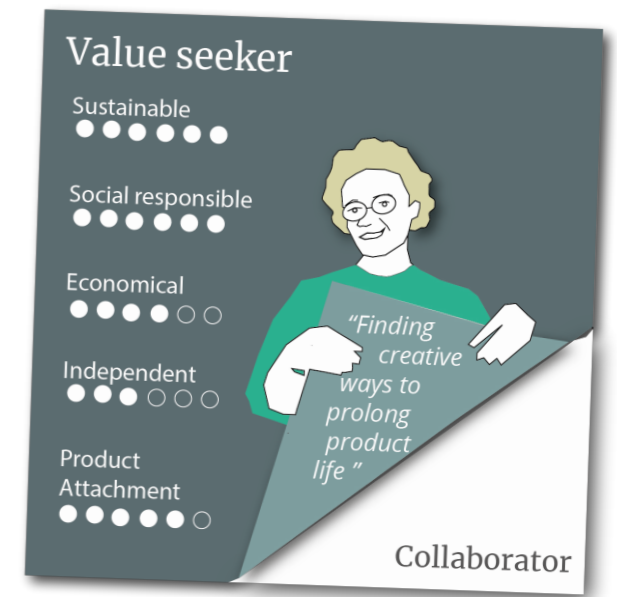
"Always trying to find ways in which things can still be usefull"

of participation to ensure resilient systems.

How to set-up this environment is still left to discover. It could be physical or digital place, but products or services could also unite people around a certain issue. For now, the environment could be explained as a space that unites different actors within a local circular economy.

2.3 SHIFTING TOWARDS HIGHER PARTICIPATION LEVELS

In order to facilitate shifts towards higher participation levels, different strategies or interventions are required. Based on what is known from consulted literature, some potential strategies can be identified.

Unaware consumers like clutterers and bin fillers need to become aware of new possibilities to discard their products.

Behavioural heuristics or nudges can be a source of inspiration to spark one-time participatory behaviour (Van Lieren et al. 2018). Once they positively experienced another way of discarding, they are more likely to shift towards aware consumers.

For the next shift, people need to make more deliberate contributions to the participatory environment. The choice for a disposition channel should not only be made out of convenient reasons, but because it is in-line with their beliefs, and they want to support it. Their products (or any other form of contribution) are discarded using a particular disposal channel because they want to preserve it. Residents should feel that their contribution is appreciated. Their opinion should be taken into account when changes to the environment are made. In order to stimulate this type of behaviour, it is important that the environment is able to communicate its goal in transparent ways corresponding with the beliefs of residents. By working across touchpoints, the environment can involve residents about the effect of the contributions at a point different points

in time where this is most effective.

By introducing extrinsic motivations, the motivation of contributors could be enlarged and enable a shift towards becoming collaborators. Collaborators are responsible for organizing and facilitating the pleasant participatory environment.

As for now, the municipality of Heiloo holds the position of meta designers, since they are responsible for the first draft of this participation process. However, if value seekers feel empowered enough to make a suggestion to the system, they should feel welcome to do so.

Due to the limiting time frame of this assignment, it was decided to focus on the first two steps in the system; surrounding passive passers. During the guerilla interviews, it turned out that most people belong to personas in level 1 (passive passers and thrift throwers). Since the passive passers are active online (because they are using Facebook/ Marktplaats) they are considered to be

3. User profile

The User Profile (Figure 38) is a part of the Value Proposition Canvas (Osterwalder et. al, 2014) which is used to clarify user understanding in relation to products and services. The User profile describes a specific customer segment, in our case, this is the passive passer. The canvas breaks the user down into three parts:

• Jobs
• Pains
• Gains

JOBS
The jobs describe what this type of resident is trying to get done. This can be functional jobs, such as declutter the attic or redecorate the living room, but

also social jobs can play a part. These jobs describe how passive passers want to be perceived by others. Examples are; look organized, be socially responsible and act sustainably. Then there are personal or emotional jobs, which refer to a seek for a certain emotional state. In our case, people are not only trying to declutter, but it could also be an attempt to progress towards a future goal and reach personal significance, or to clear the mind.

Lastly, there are also supporting jobs. These are not jobs in itself but intermediate or smaller achievements that support the journey towards the completion of a job. In our case this means deciding what to discard and what to keep, finding ways to transport/ move the product, and passing on
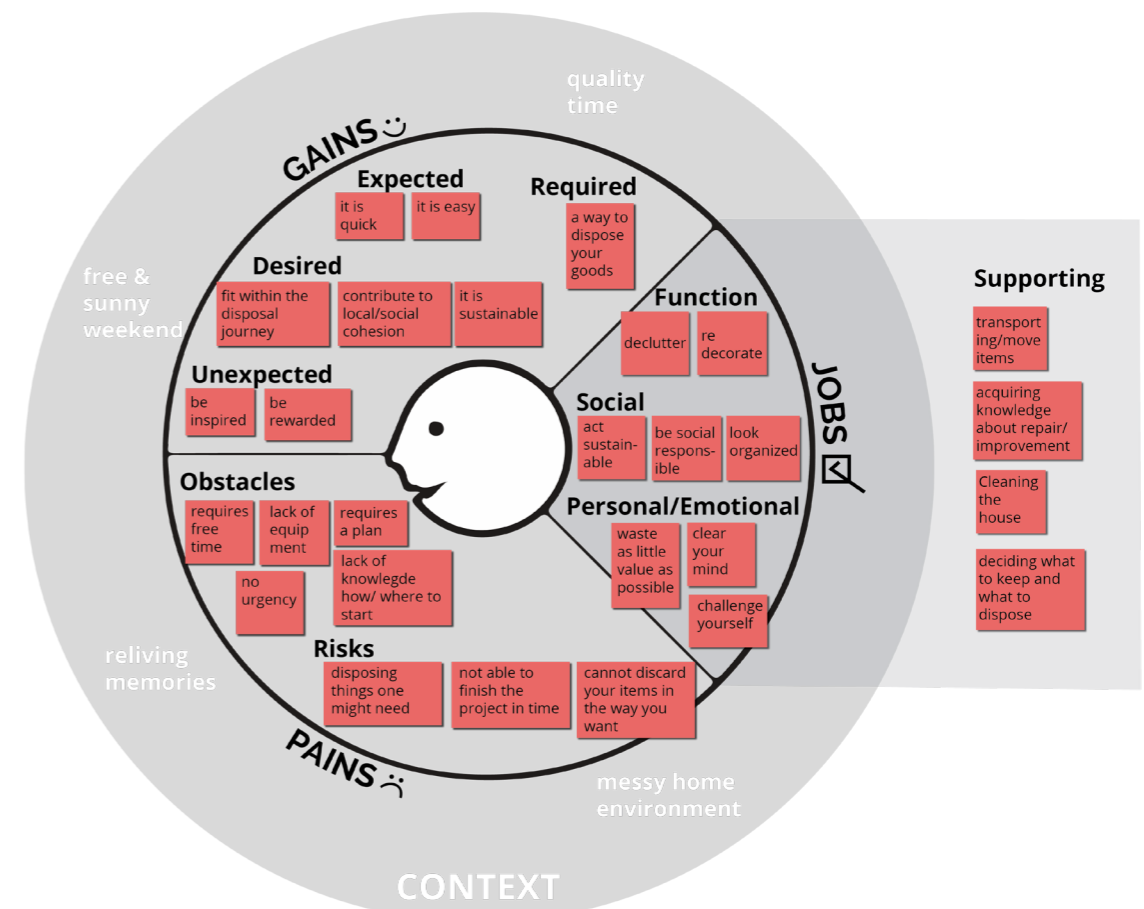

Figure 37 : Fischer's model applied on the identified personas in de BUCH

Figure 38 : User profile derived from the Value Proposition Canvas (Osterwalder et. al, 2014)

products to others.

PAINS

Pains describe anything that annoys a passive passer, before, during and after trying to get a job done. It includes undesired characteristics of the job, such as: "I don't like to put effort into products I do not like anymore" or "I feel bad every time I do this". Pains also describe obstacles that prevent passive passer from starting or finishing a job. Think about the lack of knowledge or equipment or the absence of free time or cognitive ability. Additionally, they describe risks, which refer to potentially bad outcomes. What could go wrong and have negative consequences for passive passer? Think about discarding items one still need, or not finding a proper way to discard your product at all.

GAINS

Gains describe the outcomes and benefits that passive passers want. Some gains are required, expected or desired by them and some would surprise them. Without the required gains, the solution would not work. It is the most basic expectation that we have. Expected gains are relatively basic gains that we expect from a solution, even if it could work without them. For example we expect to discard our products quick and easy. Desired gains go beyond what we expect from a solution but would love to have if we could. For example; fit within our current disposal journey, or to contribute to local initiatives or social cohesion. Unexpected gains are gains that go beyond customer expectations and desires.

4. The Behavioural Map

With a clear idea of the target group and their behaviour, it is time to focus on the behaviour change. The ultimate goal of the project is to change the discarding behaviour relating to bulky waste disposal of BUCH residents. In order to change, it is essential to first define the current behaviour that people are performing. For this, a Behavioural Journey Map (Figure 39) was created. The Behavioural Journey Map has been developed by van Lieren (2017) during her graduation.

The behavioural journey map is similar to a customer journey map, but it includes additional rows to define a certain mindset and behavioural factors. Near the bottom of the map, the desired behaviour is specified, and hotspots for design are pointed out. These hotspots are selected from the Behavioural Intervention Strategy Cards, which she developed during her graduation. The Strategy Cards are based on common behavioural heuristics.

TARGETING THE RIGHT MINDSET

For every step of the journey, a mindset was defined. This is either 'fast' or 'slow. It is often assumed that people make rational choices, but 95% of our behaviour has nothing to do with making deliberate choices; we respond to an auto-pilot system. When applying nudging techniques, the subconscious (fast thinking) behaviour is influenced. Nudges can be very effective for one-time behaviour, but it is less applicable when aiming for active input and engagement. To achieve a more active input and engagement in a certain activity, it is important to wake up the conscious mindset by designing 'moments of friction', or rational overwrites (van Lieren, 2018).

BEHAVIOURAL FACTORS

To understand where one's behaviour

is coming from, it is helpful to break it down into motivations abilities and triggers (Foggs, 2009). For every step of the journey, the motivations abilities and triggers were defined.

With this complete information on discarding behaviour, it is easier to define the desired customer behaviour.

DESIRED BEHAVIOUR

The desired behaviour can be described as a deliberate choice for making contributions to a local circular system.

HOTSPOTS FOR DESIGN

With the desired behaviour in mind, some design opportunities arise. With the help of the Behavioural Intervention Strategies Cards, the following hotspots for design were identified.

Before product disposal
· Create awareness for the problem
· Create commitment
· Reduce effort
· Enhance the active choice
· Make use of relative ranking (80% of residents make use of ...)
· Reduce uncertainty

During product disposal
· Increase decision-making points (are you sure you want to ...)
· Rewards
· Personalised feedback

After
· Reminders (notifications)

All information is presented in the map which can be found on the next page.

Behavioural Journey Map

Before product disposal — **During product disposal** — **After product disposal**

Activities
Which general steps do people go through?

| Preparing declutter / chores day | Consider what to keep and what to discard | Advertise product online | Collect and disassemble products | Discard at recycle facility | Finishing chores day | Enjoying the result |

Touchpoints
Which touchpoints do people encounter?

| Magazines Inspirational platforms | | Marktplaats, Facebook Friends/Family, Kringloop | Toolboxes Websites | Municipal website Employees Recycling facility | Hardware store Toolboxes | Social media |

Current behaviour
What actions do people perform? Break the activities down into smaller steps

Be annoyed by something	Go through your old stuff	Schedule a moment to drive to recycling facility	Decide to drive to the recycling facility	Check opening hours & waste streams	Clean up / Reorganize	
Be inspired by magazines /internet/others to change it	Relive moments	Create an advertisement by taking pictures and write a simple discription	Disassemble product/ make it ready for transport	Arrive at the municipal recycling facility	Purchase new products	Experience the result
Scheduling a day / Make a plan	Make a choice for disposition channel	Share on Facebook & Marktplaats	Load it into the car	Follow instructions of employees	Assemble new products	Showing family and friends
		Wait for a couple days, become annoyed by its presence		Unload items and discard at containers		

Current mindset
Which type of thinking is dominant in the different steps? Automatic and fast or reflective and slow?

| | fast | | | | X | X | | |
| slow | X | X | X | | | X | X |

Behavioural factors
Which factors influence the current behaviour? Think about motivations (M) abilities (A) and triggers (T)

M

| Desire for something better/new   Shame | Clear up your mind Making space in the house | Too good to waste   Solidarity   Sustainability   Wanting to get rid of it quickly | I want to dispose it now   Certainty | Social acceptance | Personal significance Rewarding result Commitment | Pleasure Proud |

A

| Finding some free time | Setting goals Scheduled time | No hassle with transport   Easy way to advertise | Having a car   Being in the mood   It is close to home   It is free | A place for all waste streams   Waiting lines | Having proper tools and materials | An improved home |

T

| Encountering it elsewhere/ magazine etc.   Sale / Advertisements | | Examples of others   'left-over items' | Being annoyed by its presence   You need to drive there anyway for other stuff   No one seems interested | Instructions from the employers | Empty room/space in the house | Newness |

Desired customer behaviour

| Preparing declutter / chores day | Consider what to keep and what to get rid of | Research options to discard goods | Prepare products according to disposal channel | Discard products according to beliefs | Make a contribution to the system | Enjoying the result |

Hotspots and painpoints
Which points in the journey have high potential for behaviour change?

Creating awareness of for the disposal problem	Reduce effort	Enhance the active choice	Increase decision points	Personalized feedback	Rewards	Reminders
Commit to a certain rule		Compare to behaviours of others				
		Reduce uncertainty				

Figure 39 : Behavioural Journey Map

5. Design Goal

6. Stakeholdermap

5.1 PROBLEM STATEMENT

The transition towards a local circular economy requires a more participatory environment where bottom-up movements are supported by top-down management (De Koning, et al., 2018). Within this environment, a set of roles need to be fulfilled by residents and the regime.
Currently, most residents act as consumers and have little opportunities to become more involved in a local circular system. Therefore, circular initiatives to be designed should not only allow consuming the possibilities it provides, but also empower residents to make meaningful contributions in order to enhance and preserve it.

Even though a large group of residents already participate from time-to-time in a circular manner, it is not enough to bring down the amount of bulky residual waste. Passive passers and thrift throwers recognise limited value in their products and do not want to spend too much time discarding them.
This project explores what is strategy is required to encourage passive passers to contribute at higher levels of the participation spectrum and thereby lower their bulky residual waste.

5.2 DESIGN GOAL

I want to encourage passive passers to participate at higher levels within a local circular system by lowering thresholds for making contributions.

5.3 CLARIFYING TERMS

ENCOURAGE
Encouraging can be seen as a way to persuade (someone) to do or continue to do something by giving support and advice.

HIGHER LEVELS WITHIN A LOCAL CIRCULAR SYSTEM
The local circular system can be described as infrastructure or initiative that facilitates the reuse of products and materials on a local level. This could be a Facebook group, a thrift store or a flea market. When participating at higher levels of this system, residents do not only use these the services provided to them but feel the responsibility to enhance and preserve them with more meaningful contributions.

CONTRIBUTIONS
The local circular system could only be preserved by contributions of residents. Contributions can be seen as small responsibilities that are fulfilled by residents. What these contributions are, depends on the system.

The infographic below displays the involved parties during decluttering or home decoration projects. The parties are viewed from the residents perspective, and are displayed according to their accessibility and whether they operate local or externally. Furthermore, a distinction is made between parties that concern repair, reuse or recycle and the ones who have a more consulting role.
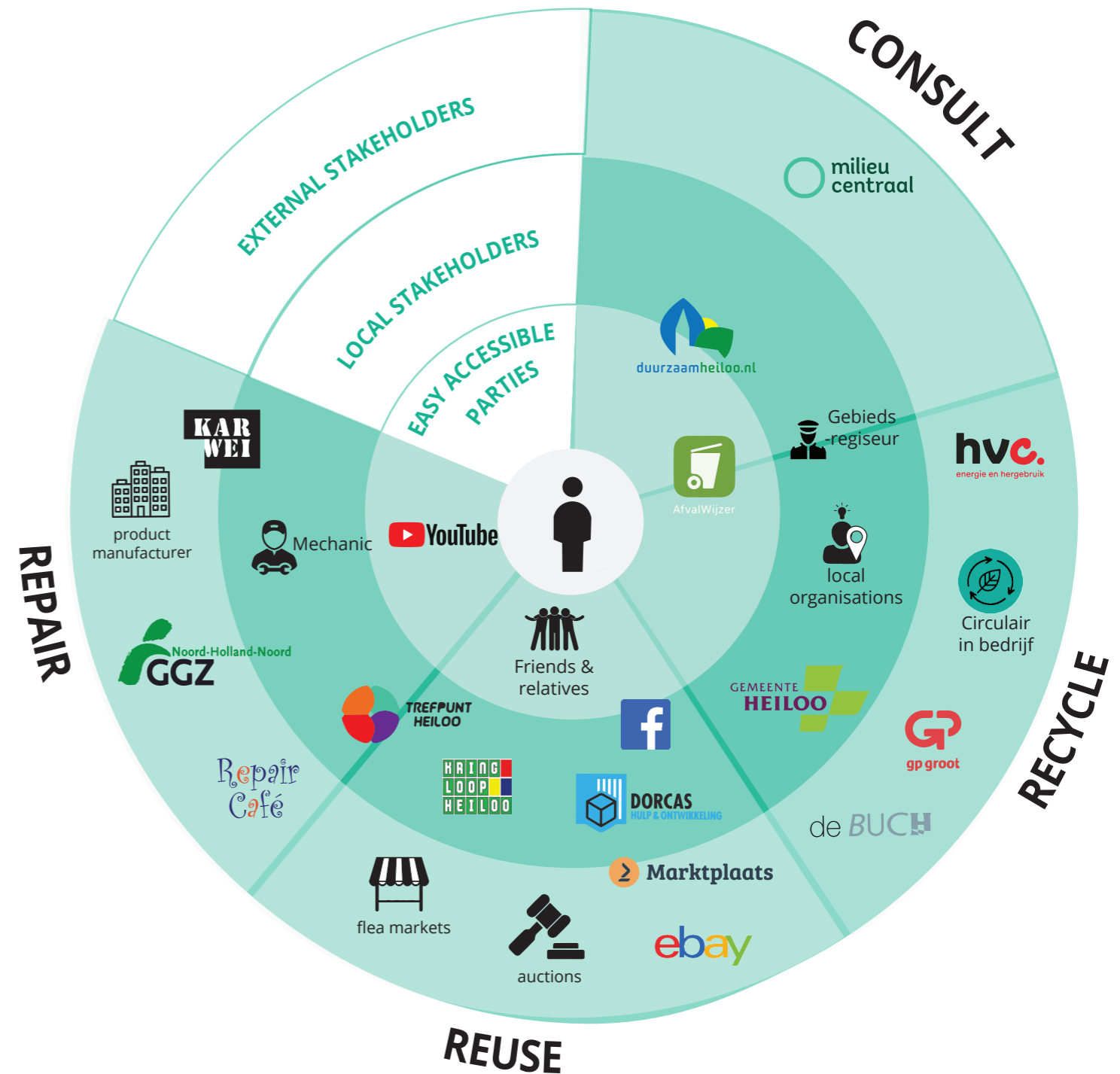
IV
DEVELOP

With the defined design statement, the time has come to generate ideas.
This development phase is characterized by the research-through-design method. Designs were created based on literature knowledge. By making this knowledge tangible, it facilitates a way to discuss it with residents. Feedback of the residents created additional insights from the real world.

This chapter will elaborate on the ideation methods that are used and the iterations that were made. It describes how first concepts were validated and closes off with findings to encourage participatory behaviour.

1. Ideation approach

DESIGN GOAL

I want to encourage passive passers to participate at higher levels within a local circular system by lowering thresholds for making contributions.

To answer to the design goal, first should be decided what the local circular system defines. A system sounds big and complex, but literature advocates to start small (Fischer, 2011). Therefore several brainstorm activities were performed to come up with an intervention which could establish a small circular system. The first ideation was done individually and was later supplemented with ideas from a brainstorm with other IDE students. The procedure of the brainstorming session is briefly discussed in Chapter 2. The pool of ideas was categorised into clusters, and potential groups were selected to be developed into concepts. How the selection was made can be found in chapter 3.

A research through design approach followed. During the concept development, an attempt was made to create broad diversity between the concepts. The concepts were presented to a Facebook community through animated videos. The Facebook community (project BENDE) served as an online infrastructure where residents could give feedback on the movies and share thoughts on the problem. Around 40 residents united themselves in project BENDE. Chapter 1.3 elaborates on this set-up. Within the concept movies, the different participation roles were left somewhat undefined. Their feedback revealed which roles they recognise and showed how they would take part in the

initiative. Yet, (as could be expected) only a few of the group members engaged themselves in the discussions. This required some additional Skype interviews to clarify opinions.

The feedback of the community revealed barriers and motives at a certain point in the disposal journey and verified some of the behavioural strategies. With this information, the conditions for participatory circular initiatives were drawn up.

2. Ideation

2.1 INDIVIDUAL BRAINSTORMING

The hotspots for design from the behavioural journey map (Figure 39), were used during the individual brainstorming session. The goal of the brainstorming session was to come up with a circular intervention which could enable residents to contribute on higher levels.
During this session around 40 ideas were generated. The ideas were categorized in 7 clusters (Figure 40):

1. Increasing awareness
2. Inspire
3. Collaborate
4. Events
5. Facility design
6. Policy measurements
7. Additions to the facility

Figure 40 : Individual brainstorming & clustering

2.2 SESSION WITH DESIGN STUDENTS

In order to receive more diverse input on the topic, 5 master students from the faculty of Industrial Design Engineering were invited to participate in an online brainstorm session.

GOAL
The goal of the session was to gain a new perspective on the problem and to generate numerous fresh ideas.

PROCEDURE
As a preparation for the session, all students watched a short movie clip in which the context of the project was explained. The idea of a circular centre was communicated and a definition of circular participation was given. At the end of the movie, the participants were asked to complete a small association assignment so that experiences could be shared at the beginning of the session. The session was hosted making use of the online co-creation tool Miro. Zoom allowed the participants to see and talk to each other. After an ice-breaking activity, the participants shared their associations and similar associations were clustered. With this information, they were asked to formulate a problem statement based on their associations and the information in de video.
The following problem statement was created:

The van de Heuvel-family tries to re-organise the house since the eldest son has left for his study. The sudden death of the grandparents has left the family with more unnecessary stuff. Yet, it is emotionally hard to make proper choices about what to keep and what to discard. After this tiring process considering multiple disposal channels is
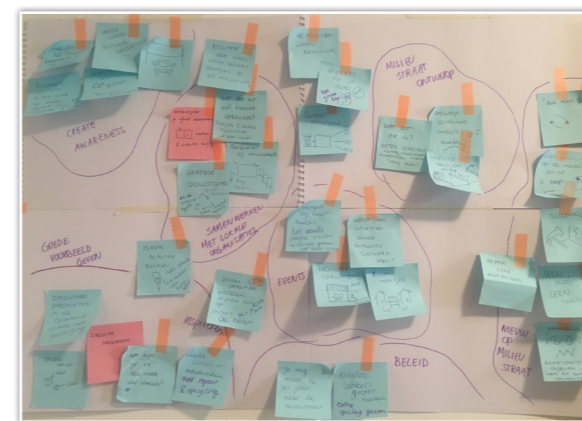
Figure 41 : Miro-board with ideas generated in the session with IDE students.

too much effort.

Based on the problem statement How-to questions were formulated. How-Tos are problem statements written in the form of a question (van Boeijen, Daalhuizen, Zijlstra, van der Schoor) The 5 most inspiring questions were selected to be responded using the Brainwriting method. This lead to over 50 answers to questions like:

- How to sort home products quickly?
- How to capture emotional value without capturing the item?
- How to discard if you might still need it?
- How to know that you make the right choice?
- How to minimize emotional feelings during the declutter process?

The session ended with all sorts of answers to these questions (Figure 41). A few days later, these answers were used as a source of inspiration to generate ideas.

Materials used in the session can be found in Appendix D1.

2.3 CONCLUSION

One important rule during creative thinking is to postpone judgment (Tassoul, 2009). This had led to a lot of creative ideas. Nonetheless, some are more applicable than others.

The session with IDE students led to ideas applicable in the home environment of residents. They saw the problem originating there, and focussed more on the issues experienced by clutterers. The individual brainstorming was more directed towards an intervention in the public realm and waste reduction in general.

Not all ideas were direct answers to the design goal. Some of them where strategies to involve residents; create awareness or other methods that could bring down the amount of waste. This created the broad diversity that was aimed for.

3. Select & Develop

3.1 ORGANIZING IDEAS

In order to discuss the ideas with residents, the number of ideas should be brought back to a manageable number.

The ideas were first clustered, and these clustered were named (Figure 42). Afterwards, ideas from different clusters were organized on a coordinate system (Figure 43). The ideas were placed in the system based on their match with the motives of passive passers, and the ability to provide different participatory roles. Ideas from the upper right corner had the most potential to succeed, and these were combined and developed into concepts. The ambition was to create a broad diversity between the concepts to discuss different ways of participation with residents.
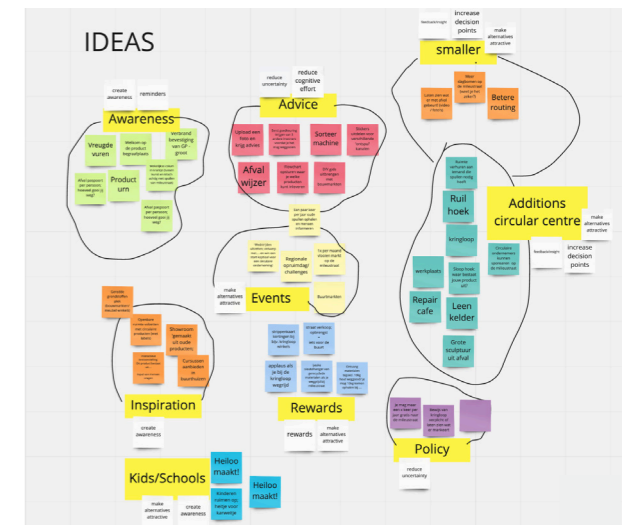
Figure 42 : Miro-board with ideas organized in clusters (yellow labels). The white post-its resembles hotspots for design derived from the journey map. An enlarged picture of the board can be found in Appendix D2
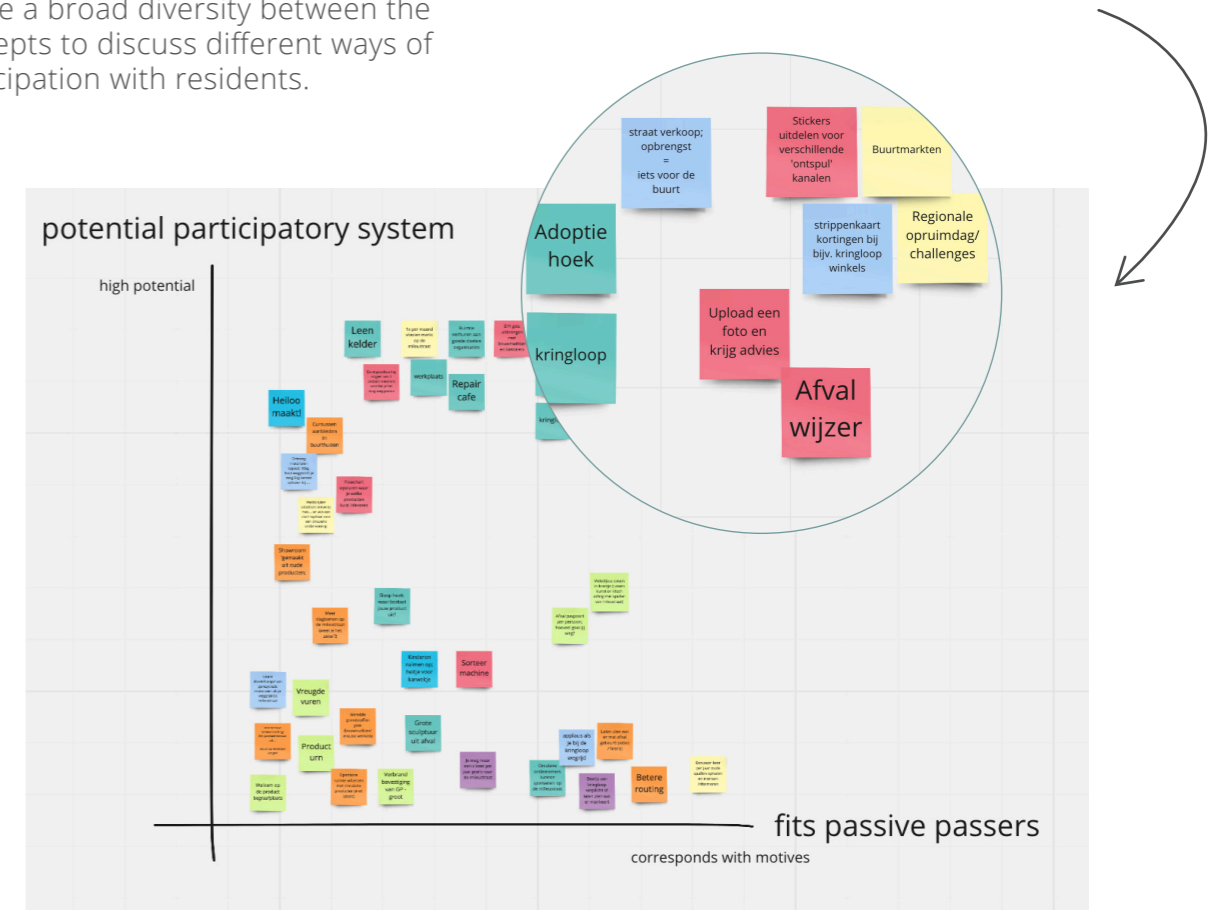

Figure 43 : Miro-board with ideas organized organised based on their fit with motives of passive passers and their potential to initiate a participatory environment. An enlarged picture of the board can be found in Appendix D3
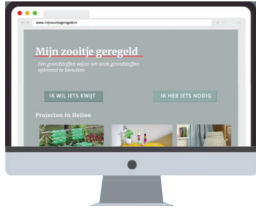
3.2 DEVELOP

During the development phase, the ideas were refined into concepts. Each idea is briefly described in the left column of the table below (Figure 44) The ideas were enriched with additional insights shown in the table.

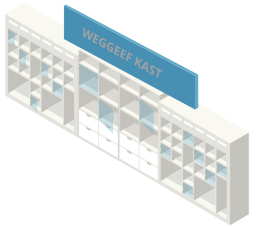The potential roles in the participatory initiative were defined together with the behaviour change(indicated with the arrow).

The hotspots for design, based on the behaviour strategies, were added. These hotspots could likely facilitate the desired behaviour. The matching motivations of the passive passers during decluttering are shown in the last column.

With these specifications in mind, the concepts were created and shared with the community.

	Roles				Behavioural Strategy	Motivations
	consumer	contributor	collaborator	meta-designer		
ZOOITJEGEREGELD.NL This website holds a collection of all circular (product) services in the municipality. Local entrepreneurs/ organizations can easily collect materials and promote their businesses (think tailors/bicycle repairers, etc.). All alternatives are evaluated in terms of footprint (repair, reuse, refurbish) and social responsibility. One can also find inspiration on how to patch products yourself and start your own quest for certain materials.	Residents exploring alternatives on website to get inspired →	Residents donating items to support locals	Residents/ organisations initiate their own collection event & sharing content	Municipality of Heiloo Website team Duurzaam Heiloo	Reduce effort Enhancing the active choice Credible messenger	Sustainability Solidarity Too good to waste Examples of others
WEGGEEFKAST This closet stores second-hand products that are free to take. During the 50 days in between Easter and Whit Sunday (popular declutter days), a closet is placed at the municipal recycling facility. Residents can put their products which are still usable inside the closet and add a small description and the date. The closet displays the product decently which seduces to have a look yourself. Residents determine the rules of the closet. By guaranteeing a certain quality of the products inside the closet, social norms will prevent people from placing low-quality items inside.	Residents placing items in the closet. →	Residents mentoring content of the closet Suggesting rules to improve it	Seeking ways to implement new rules	Municipality of Heiloo Initiative taker Thriftstores	Reduce uncertainty Reduce effort Increase salience Enhancing the active choice	Wanting to get rid of it quickly Certainty Easy way to advertise Too good to waste Solidarity
LAATSTE RONDE A few weeks a year, this event is hosted. A space is made available in the neighbourhood, where items can be placed for a 'final round'. Items must first be reported and approved by other residents of the neighbourhood. In this way, clutter is prevented from entering the streets. If items are not taken after the few days of the event, it will be picked up by the municipality and brought to the recycling facility.	Residents taking part in the neighbourhood event by placing items in designated spot →	Residents approving items of others	Neighbourhood association sending out a request to the municipality Area directors	Municipality of Heiloo Duurzaam Heiloo	Credible messenger Personalized feedback Reduce uncertainty Functional friction	Social acceptance Certainty Easy way to advertise Too good to waste Solidarity

Figure 44 : Concept development; design of participatory initiatives.

3.3 FACEBOOK COMMUNITY

The designed concepts provide a new way of acquiring knowledge about a desired participatory initiative. By creating prototypes of the experience people could express what they desire and what is less important to them. This is also known as the research through design approach.

The concepts were prototyped in the form of animated videos and were shared in the Facebook community; project BENDE.

The Facebook group project BENDE was set-up to create a community of interest. An invitation to join was spread via social media of the municipality of Heiloo and the Facebook-group "Je bent Heiloo'ers als...".
The invitation firstly described a relatable problem; a lot of people are decluttering, and numerous proper products are simply discarded and materials wasted. Thereafter, it explained how this graduation project wishes to examine together with residents what is needed to change this. It reported that every week ideas were shared via videos, and residents were welcome to share their ideas and opinions. Not only for the sake of this graduation project but also to get involved in the development of sustainable initiatives within the municipality. This invitation was answered fairly enthusiastically, and around 40 people entered the community.
Within the Facebook community, some previous research results were shared. Every week a video of the concepts was shared. The videos were accompanied by a description which explained the benefits of the concept. The text also asked the community how they would use it, and where they saw pitfalls (Figure 45).

Only a small amount of people

(+- 5) actively engaged in the group. Unfortunately, the responses declined every week, and it turned out to be challenging to engage people for an extended period of time. Experiments with different ways of collecting feedback followed. It turned out a poll was the most effective strategy to gather feedback; 12 residents voted. One could argue that it was difficult for people to react or comment on the videos. The questions might be too open, or people were not motivated enough to really form a grounded opinion on the ideas. Eventually, some active members of the group were approached personally and invited to an interview. Fortunately, four people were really willing to share their view, and these conversations lead to richer insights. The interview guideline can be found in Appendix D4.

The insights of the residents are presented with the concepts in the next chapter.

Figure 45 : An example of how the ideas where shared with the Facebook community.

4. Concepts

4.1 MIJN ZOOITJE GEREGELD

ABOUT
The demand and supply platform MijnZooitjeGeregeld puts local circular organisations and initiatives on the map. The website includes a guiding feature for used items, to help people find the correct destination to discard them. It gives insight into the impact of the different disposal choices and rates the disposal possibilities in terms of sustainability, social responsibility and required time. It instructs people how to hand in the items and what happens to them afterwards. In this way, residents can make a more balanced decision and it empowers them to support other locals. Residents can also put their own acquisition initiative in the air when they are looking for specific items. Collectors can share their experiences on the platform to encourage new members to do the same. The platform combines different existing platforms like marktplaats, afvalwijzer and the local newspaper.

BEHAVIOURAL STRATEGIES

- *Reduce effort*
  By reducing effort, the barriers that hinder people from taking action are removed. By introducing the guiding feature, people could fill in their product and its features and obtain an overview of what is possible, instead of researching the possibilities themselves.

- *Enhance the active choice*
  Stimulate people to make an active choice in the desired direction by highlighting the benefits of the preferred behaviour and underlining the disadvantages of the less favourable alternative.
  By assessing the various alternatives, it creates transparency and it becomes more attractive to go for the initiative which scores highest regarding your personal motivations.

- *Credible messenger*
  People are greatly influenced by the one who delivers them information.

watch movie
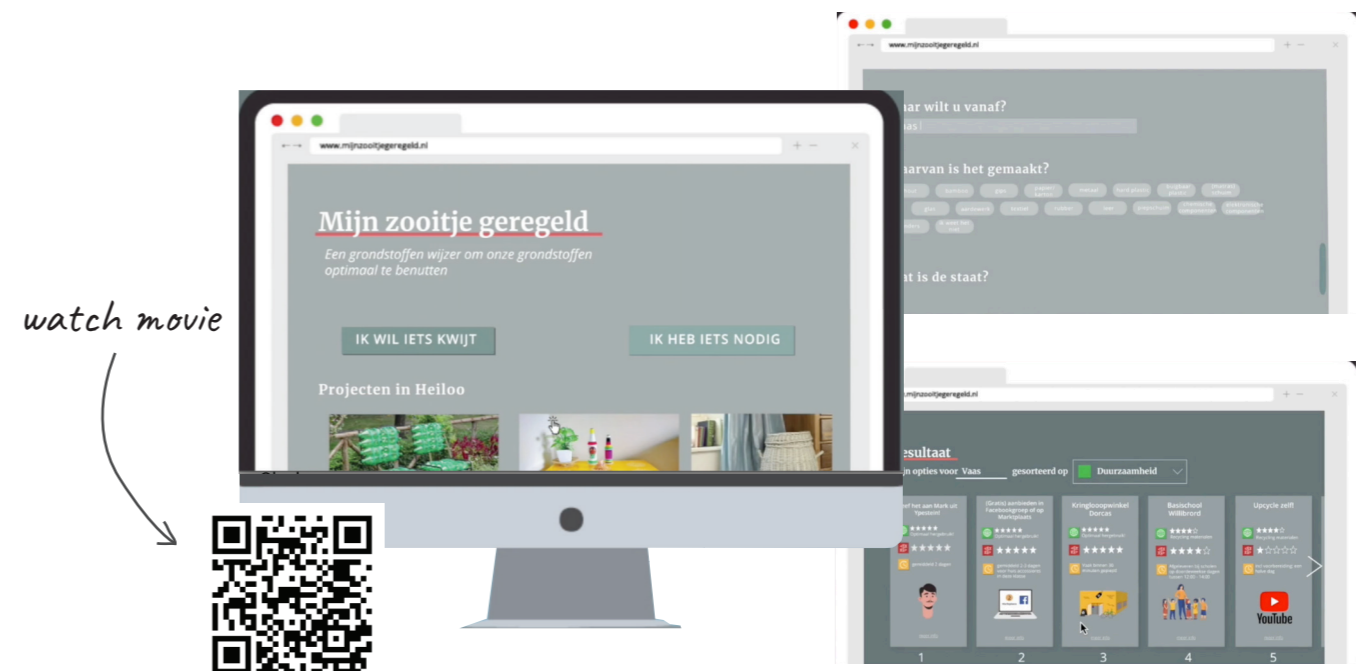
The landing page shows examples of successful circular events and initiatives. By showing this behaviour of others, people with similar motivations are seduced to do the same.

INSIGHTS
The community members were quite positive about this proposal. Some of them mentioned it opened up a new range of possibilities that could fall in between Marktplaats or the municipal recycling facility. Most people were using Marktplaats or Facebook to advertise their products, so they saw this as an extension to the other platforms. However, one of them suggested that integrating it with different platforms would be the easiest.
Residents identified different roles in the conversations, most of them, yet, saw themselves participating in consumers or contributors- roles. They saw collaborator roles more for local organisations, such as schools, elderly homes etc. One woman mentioned she liked to make things out of waste products such as can-clips or beer caps. She suggested that it could also enable artists or people like her to collect these materials for DYI projects. Two women mentioned that seeing a project of others could inspire them to reduce their own CO2 footprint. They like to learn and see what is possible.

There were also some points of critique. If the platform is becoming a success, an interviewed man expects that care homes and schools will quickly overflow with junk.

" When my grandchildren need something for school, the whole family messes up their houses to look if they have a specific thing."

Several residents also pointed out the challenging 'start-up' phase of the platform. Marketing and advertisement are needed to make people aware of the possibilities; however, this could be challenging. The platform is not something you use frequently, so it has to spark your interest at the right time. One man also mentions that he does not see this platform working for people who currently discard everything at the municipal recycling facility, or throw their home products with the household waste. They are not going to invest their time in this platform, what is in it for them? However, if the goal is to trigger a more deliberate decision of people who were considering other ways to discard, it might work.

The feedback of residents is summarised in the following conclusions.

CONCLUSION
- People are poorly aware of alternatives for product reuse.
- Sharing examples of others behaving in the system inspire like-minded to participate on higher levels. People want to, but do not know how to. This could go beyond reusing home products, and inspire people to adjust their daily sustainable behaviour.
- In order to make a new circular initiative work, it should be easy to just 'consume' in the first place. A group of consumers need to be acquainted to create a supportive base.
- An online environment could work; however, it requires occasion-directed marketing and preferably integrates with other frequently used platforms.
- In order to get unaware consumers on board, it should be a rewarding experience.

4.2 WEGGEEFKAST

ABOUT
The Give-Away closet is a familiar concept for many residents. It stores second-hand items that are free to take. During the declutter season, the cabinet is placed at the municipal recycling facility. At this location, it becomes an extra decision point, by persuasively asking: are sure you want to waste this? This moment of friction stimulates participation on the first level. By letting the residents determine rules concerning the closet, a certain feeling of responsibility is created. Residents can put the items in the closet and write a small description to it to make it attractive for the ones interested in the articles. If there is no interest in the items, they could be picked up by the thrift store or disposed at the municipal recycling facility.

BEHAVIOURAL STRATEGIES

- *Enhance the active choice*
  Stimulate people to make an active choice in the desired direction by highlighting the benefits of the preferred behaviour and underlining the disadvantages of the less favourable alternative.
  When encountering the closet on the

municipal recycling facility it creates an extra decision point. It provides an attractive opportunity to pass on your products to those who need it.

- *Reduce uncertainty*
  People tend to bypass options that do not explain clear steps or have an uncertain outcome. Barriers that comes with donating products to thrift store relate to a particular uncertainty. People are not sure whether the thrift store will accept it, and do not feel like driving all the way up there. The give-away closet takes away this uncertainty and reduces this risk.

- *Increase salience*
  Encountering the closet at the municipal recycling facility can be an eye-opening experience. It creates an impression of what products are usually discarded. By presenting them in a nice manner, people could look at them differently.

- *Reduce effort*
  By reducing effort, the barriers that hinder people from taking action are removed. In this case, people do not like to spend time waiting for someone to show interest in their product. The closet provides an opportunity to pass on the product

WEGGEEF KAST

watch movie

without taking too much time.

INSIGHTS

The Give-Away closet clearly sparked less interest of the residents. A lot of practicalities were brought up concerning the size of the closet and lousy weather scenarios. It was unclear who was in the end, responsible for the closet. Residents did not saw an opportunity to do it themselves. When asking which rules there should be drawn up, most people concerned about the quality of the products. They all agreed that the threshold for participation was low, so rules had to be defined in order to maintain it. It should be clear what items could be placed and what items are worthless.

" It is hard to put it black and white. Something could still be useful in the eyes of one, but someone else can look at it saying: this is rubbish."

Two people suggested a new role; a supervisor who could check the products and guarantee a certain quality level. This could be someone working for the thrift store or the municipality.
One woman thought this was not ideal either since this person had to drag around products all day. She agreed that the responsibilities should be at the residents. Since throwing away your item was just as easy, she expected that if the rules were clear, it was not an extra effort to discard trashy items.
She did mention an important aspect; everyone should be aware of the rules and should feel a need to respect them.

Another man argued that in order to make it clear what could be placed, the closet could also be used for specific items such as bicycles or electronics. In this way, it was more clear what was allowed to be placed. The cabinet can be maintained by, for example, a sheltered workshop or repair cafe.

CONCLUSIONS

- The give-away closet is a powerful way to seduce people to participate in a local circular economy.
- Rules are important to manage the system. All participating people must be aware of them.
- It should be clear who is responsible in the end. This could be residents but also other stakeholders, such as thrift stores or sheltered workshops.
- It should be clear what happens to the products, this could help in the assessment of the quality.
- It is very easy to consume the give-away closet, but only a little amount of residents do see opportunities to contribute by maintaining it themselves.
- Since the threshold for participation is almost equally high as throwing away, misuse of the initiative might be avoided.

4.3 LAATSTE RONDE

ABOUT

The yearly event of 'last round' is a neighbourhood event supported by the municipality. It invites residents to bring out their items for reuse, and advertise them at a central place within the neighbourhood. Things must first be registered via a platform to prevent clutter from entering the streets. Other participants can judge the quality of the items on the website, and approved items can be placed at the designated spot and also appear online. In this way, a collaborative effort is made, and the reach of your product offer is increased. Residents can continue decluttering or redecorating in the meantime. At the end of the event, the municipality picks up the left-over pieces and discards them at the recycling facility.

BEHAVIOURAL STRATEGIES

- *Credible messenger*
  People are greatly influenced by the one who delivers them information. The 'last round' event is announced in the local newspaper and distributed through neighbourhood associations. It responds to the neighbourhood feeling and in this way encourages participation.

- *Reduce uncertainty*
  People tend to bypass options that do not explain clear steps or have an uncertain outcome. The pick-up service of the municipality reduces a fear of not losing your product. This will make people less worried offering their products to others because it gives them a particular certainty that they will get rid of it anyway.

- *Functional Friction*
  People are asked to put in a little bit extra effort to get to their goal. By requesting small additional actions, it disrupts mindless automatic interactions. When people register for the event, they have to upload pictures of the items they want to dispose. They are also asked to judge the items of other participants to prevent clutter from entering the

watch movie

neighbourhood.

- *Reduce effort*
  By reducing effort, the barriers that hinder people from taking action are removed. In this case, the event reduces the barrier of transporting items or visiting multiple disposal channels. Additionally, it makes it easy to acquire second hand items.

INSIGHTS

This initiative was positively received by the residents, but again some critique points were addressed. Residents mention the advantages of this initiative for bigger or more heavy items. They like the fact that it gives you a kind of certainty since the municipality is taking it away at the end of the day. Also, the collaborative decision-making of what is usable and what is not has been perceived as a nice touch. One could also already get an indication of the products that are offered.
However, most people fear that it will soon look like a landfill if the rumour starts spreading about this pick-up service of the municipality.

" Once I have put some old goods on the street and paid for the pick-up service of the municipality, a few hours later some of my neighbours added their junk to it."

This makes it less favoured to have this location near to your home. Moreover, two people mentioned that trashy items attract loiterers. The element of the online environment was, in most cases, considered unnecessary or too much of a hassle.
The traditional neighbourhood markets or small kiosks in the front yard might be the more applicable version of this.

As with the give-away closet, the first level of participation, in this case, is too easy, which requires rules and

more supervision to prevent undesired behaviour. However, initiatives like this are rising in Heiloo. Observations from Facebook community show people selling items in their front yards for a day. It is worth investigating how the municipality could stimulate or encourage this behaviour in an organised way.

CONCLUSION

- People would like to contribute to an idea like this but expect a lot of mis-use around it.
- Residents are willing to put small efforts before participating in an initiative to ensure the quality of products.
- If first-level participation is too easy, it will also empower people to get rid of trashy items effortlessly.
- Feedback or insight is a nice confirmation for the behaviour. However, people do not want to leave contact details at the time of disposal, or experience extra hassle by filling in tickets.

4.4 FEASIBILITY

The concepts have also been discussed with experts working on the waste collection issue and proposed to Duurzaam Heiloo. The goal of these interviews was to not only assess the desirability but also see what is feasible.

One of the experts, Anbeek, Commercial Director of AddComm was interviewed. AdComm is the company behind the afvalwijzer (waste-guide application), which is currently used by 5000 residents within Heiloo. In the Afvalwijzer, residents can see on which day a waste stream is collected and can find the nearest containers. Currently the Waste Guide Application has a built-in function called the Waste ABC, Anbeek explains (Figure 46). This enables residents to look up products and see to which waste bin they belong.

" We have made a general set-up for the Waste ABC, but municipalities are in charge of the content and are free to adjust this by involve local parties."
- Maarten Anbeek, Commercial Director of AddComm

Now that the municipality of Castricum wants to start with Diftar*, Adcomm and the BUCH are discussing how residents can use the application to gain more insight into their discarding behaviour. By keeping track of how many kilos they discard in the app, they are not surprised by yearly waste charges. With this data, one can also compare their amount of waste to other similar households. This can work very stimulating for people since they see it is possible to save some money.

Similarly, some ideas were proposed to Valkering: sales specialist at Circulair in Bedrijf, a sister company of waste processor GP Groot. Circular in Bedrijf makes it accessible for medium-sized companies to take their first steps towards becoming a circular company. They are experimenting with ways to upcycle industrial waste into useful products which they sell back to the companies or individuals.
During Valkerings time at GP-groot, he has been the contact person for the BUCH for a number of years.
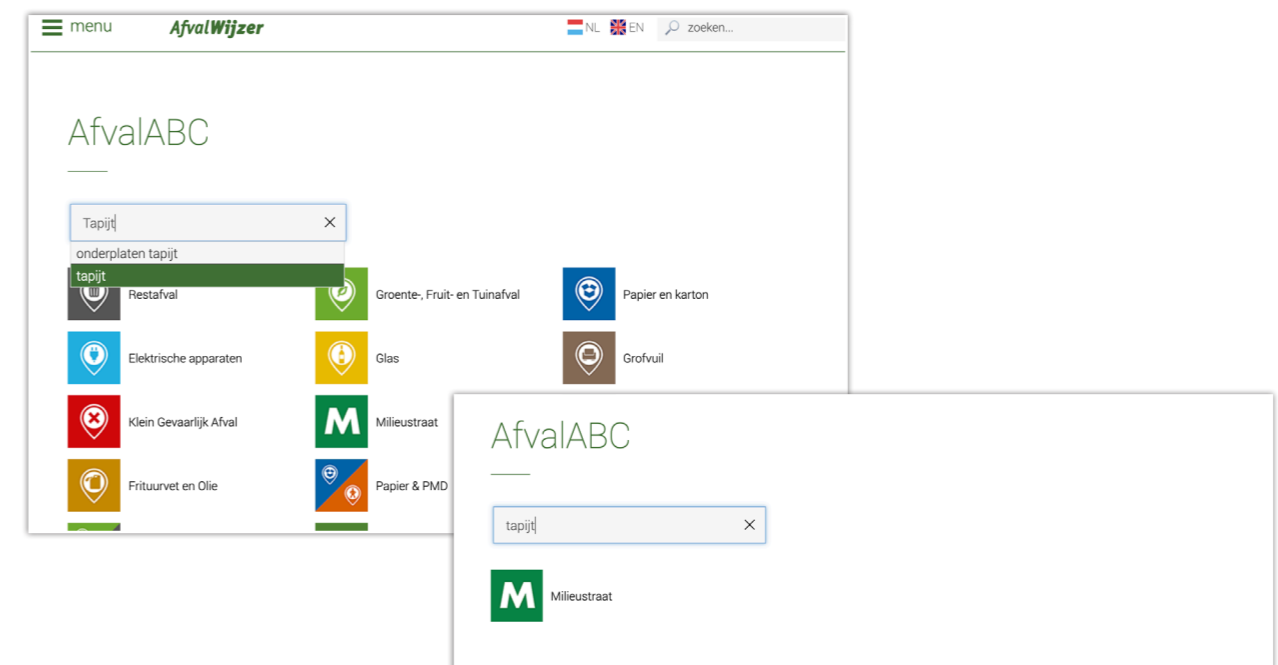Circulair in Bedrijf is located in Alkmaar and has worked for various companies

Figure 46 : AfvalABC (Waste ABC) as designed in the AfvalWijzer(WasteGuide) web and mobile application developed by AddComm

within the region.

"With small and accessible steps such as the purchase of a waste separation module, circularity comes to the fore. This allows companies to take bigger steps in the future."

- Marc Valkering, Sales Specialist at Circulair in Bedrijf

Last but not least, the concept movies were shared with Hofman, board member of the entrepreneurs association Duurzaam Heiloo. Some ideas have also been initiated by Duurzaam Heiloo, he explains. In discussions with the municipality, it turned out that such initiatives require a supervisor to monitor residents. Thrift stores were involved, but none of them seemed interested in having a container at the municipal recycling site. Thrift shops receive more than enough, and it turned out to be difficult to motivate a staff member (often volunteers) to spend all day on the recycling facility. Also the idea of collaborating with sheltered workshops was turned down for unknown reasons.

CONCLUSION
The interviews offered a different perspective on the concepts. In terms of feasibility, all concepts need some further development to become a reality. The first concept is possible. However, it requires some investments from the municipality and an external party like AddComm. A first set-up could be tested by adding repair opportunities as possible outcomes of the application and include suggestions like thrift stores or selling via Facebook groups. However, in order to become a platform for inspiration supported by the public, a lot still needs to change. This might not be in line with the aspirations of de afvalwijzer, so a new party should get involved.

Circulair in Bedrijf tries to move circular business forward on the agenda by selling simple products made from recycled materials to companies. These small steps put circularity on the map and lead to bigger steps in the future.

Lastly, a version of the giveaway cabinet has once been proposed by Duurzaam Heiloo. They desired a place at the recylcing facility where items for reuse could be stored. Unfortunately, little action was performed at the time due to the lack of interested parties to take over responsibilities. More might be possible within the ambition of a circular centre and by exploring a more responsible role of the residents.

5. Findings

Due to the research through design approach, various valuable lessons have emerged.

NO PARTICIPATORY SYSTEM FROM THE START
Firstly, it appears to be challenging to set up a participatory initiative surrounding a novel idea. It is strangely complicated to give residents responsibilities from the start if they have not been part of the development process. However, it is still essential to create an opportunity for residents to develop themselves into these roles.
To motivate people to participate in a new initiative, the mechanisms to participate need to start from scratch, at the unaware consumer. Various behavioural strategies can be applied to transform this group into aware consumers and ultimately; contributors.

SETTING THE BAR AT MATCHING HEIGHTS
Even though the concepts were created with the motivated passive passers in mind, they do not exist in a vacuum. People with less altruistic intentions might be exploiting the system for personal advantages.

When designing a way to participate for a certain type of resident, it is important to design a threshold that is slightly lower as the motivation that is present.
A dangerous pitfall is to design the threshold to participate too low. In these cases, the initiative could attract junk and will quickly fall apart. Multiple residents also brought this up during the interviews. It is therefore important that people with the right motivations can participate and that the careless people are discouraged. What the threshold for participation is should be

well-considered and balanced.

DEFINING THE RIGHT STRATEGY
The concepts presented in the previous chapter were designed with the passive passer in mind; someone who wants to, but who mainly makes choices out of convenience. This character is aware of alternatives such as Marktplaats and thrift shops and uses these channels primarily based on convenience considerations.
Different behavioural strategies have been applied in the concepts to provoke a more conscious choice for a disposition channel, and engage passive passers into a circular economy. The interviews show that some behavioural strategies are more suitable than others. Some additional suggestions were made to optimise the intervention. These suggestions are translated into new behavioural strategies. An overview of the different strategies within the discarding journey is presented on the next page.

AUTOMATIC/INTUITIVE

event prompting declutter

5 — make a plan

arrange tools: storage boxes, trailer, help of others etc.)

1 — consider what to keep and what to discard

3 2 1 — choose a disposal channel for the items you want to get rid of

6 — prepare items according to disposal channel

get rid of the item(s)

7 — finish your project

enjoy the result

SLOW/REFLECTIVE

AUTOMATIC/INTUITIVE

event prompting declutter

make a plan

arrange tools: storage boxes, trailer, help of others etc.)

2 — consider what to keep and what to discard

choose a disposal channel for the items you want to get rid of

prepare item(s) according to disposal channel

2 6 5 3 4 1 — get rid of the item(s)

finish your project

enjoy the result

SLOW/REFLECTIVE

---

9 4 8

AUTOMATIC/INTUITIVE

event prompting declutter

make a plan

arrange tools: storage boxes, trailer, help of others etc.)

consider what to keep and what to discard

choose a disposal channel for the items you want to get rid of

6 6 1 — prepare items according to disposal channel

get rid of the item(s)

7 — finish your project

enjoy the result

SLOW/REFLECTIVE

LEGEND

COLORS

🟢 Effective strategy

🔴 Risky strategy

⚪ Newly suggested strategy

NUMBERS
1. Reduce effort
2. Enhancing the active choice
3. Social norms
4. Reduce uncertainty
5. Increase salience
6. Functional friction
7. Personalized feedback
8. Create commitments
9. Credible messenger

LINES

Original discarding journey

Envisioned journey of the concept

The graphs above show the behavioural journey of residents using the concepts. A distinction has been made between; automatic/intuitive thinking and slow and reflective. The white line represents the original user journey.
Behavioural strategies are indicated by numbered dots. Based on the interviews with the residents, it was assessed whether this behavioural strategy has a particularly positive effect at that place in the journey, or a negative effect (misuse). During the interviews, residents made some suggestions how the concept could be improved. This was translated into new behavioural strategies which are represented in white dots.
The (possibly) successful intervention moments can be deduced looking the above graphs:
• during planning
• during product assessment (what to keep and what to discard)
• while choosing a disposition channel
• while preparing for disposal
• during disposal
• after disposal
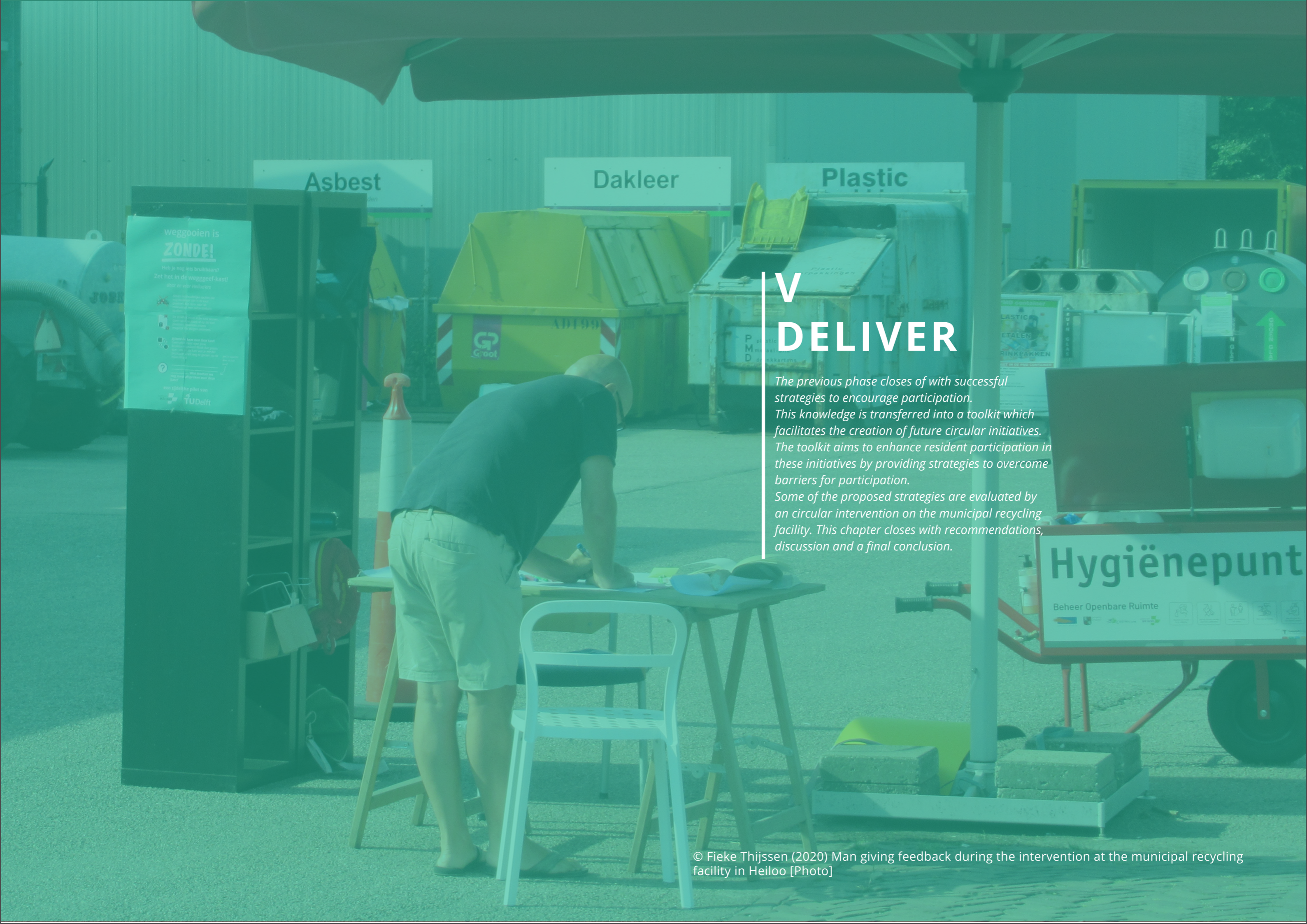
V
DELIVER

The previous phase closes of with successful strategies to encourage participation.
This knowledge is transferred into a toolkit which facilitates the creation of future circular initiatives. The toolkit aims to enhance resident participation in these initiatives by providing strategies to overcome barriers for participation.
Some of the proposed strategies are evaluated by an circular intervention on the municipal recycling facility. This chapter closes with recommendations, discussion and a final conclusion.

© Fieke Thijssen (2020) Man giving feedback during the intervention at the municipal recycling facility in Heiloo [Photo]

1. Design for Participation Toolkit

The development phase resulted in more knowledge about barriers and motivations that are present during a decluttering process. It turned out that barriers for participation greatly dependent on the person. Also, some people have more significant incentives to participate and could, therefore overcome multiple obstacles. If everyone should be able to participate, the threshold must be extremely low, which creates a great risk of misuse of the initiative. People without circular motivations could abuse the system by discarding useless items via the newly developed channel.

With insights from the development phase, it is now possible to link the barriers that arise during a decluttering journey, with a behavioural strategy that could overcome them.
The Design for Participation toolkit includes a set of barriers cards and links

these with behavioural strategy cards. Some strategies are hypothetically confirmed with the use of concepts. Others are added through suggestions of residents and additional strategies obtained from the Behavioural Intervention Strategy Cards (van Lieren, 2017). The latter includes nudges, and rational overwrites and has been developed by van Lieren (2017) during her graduation project.

1.1 ABOUT THE TOOLKIT

To enable de BUCH to reduce the barriers for residents to participate in local circular initiatives, a design toolkit has been developed. The toolkit enables de BUCH to create new or improved circular initiatives in a structured manner.
The cards provide an overview of motives, barriers and strategies regarding circular participation. With the

use of the design canvases, a structured and hands-on process is facilitated. The toolkit supports the creation of new and improved circular initiatives which could catalyse the transition towards a local circular economy.

1.2 ENVISIONED USERS

The toolkit is initially developed for de BUCH municipalities and could be used by civil servants; policymakers and area directors.
The use of the toolkit starts after an initial idea for a new or improved circular disposition channel. It is therefore essential to include the initiative taker into the design activity and make them part of the development process. Oftentimes, these initiative takers are residents or local entrepreneurs. The various interviews learnt that people are willing to think along or have great ideas themselves. In these cases, residents need to be able to join the session as well.

The toolkit is assumed to be the most effective diverse teams. This not only ensures an integral solution but the activity of collaborative framing and prototyping of what the 'object' to design needs to enable many to design for resilience. (Mulder & Loorbach, 2018, p.6). Area directors could be the facilitators of the design process and bring multiple people together.

1.3 CONTENT OF THE TOOLKIT
See Figure 47.

45 cards
4	persona cards
18	barrier cards
12	design strategy cards
3	trump cards
8	blanco cards

3 design canvasses

1 poster

1 instruction sheet

1.4 THE USE OF THE TOOLKIT

The use of the toolkit starts with an initial idea for a circular disposition channel. This could be a thrift store, second-hand market or a local entrepreneur who likes to collect reused materials.

FULFIL DESIGN PRINCIPLES
In order to use the toolkit, the envisioned initiatives should match the conditions on which the toolkit was built. These conditions are called design principles, visualised as cards at the top of the first canvas.

The initial idea must:
• fit within the idea of a local circular economy. It serves as a new or improved disposition channel which facilitates a lifetime extension of products and materials.
• requires the participation and/or contributions of residents/individuals. These residents can come across the initiative in multiple ways.

The initiative needs to fit within the idea of a local circular economy. It serves as a new or improved disposition channel which facilitates a lifetime extension of products and materials.

The initiative requires the participation and contributions of residents/individuals. These residents can come across the initiative in multiple ways.

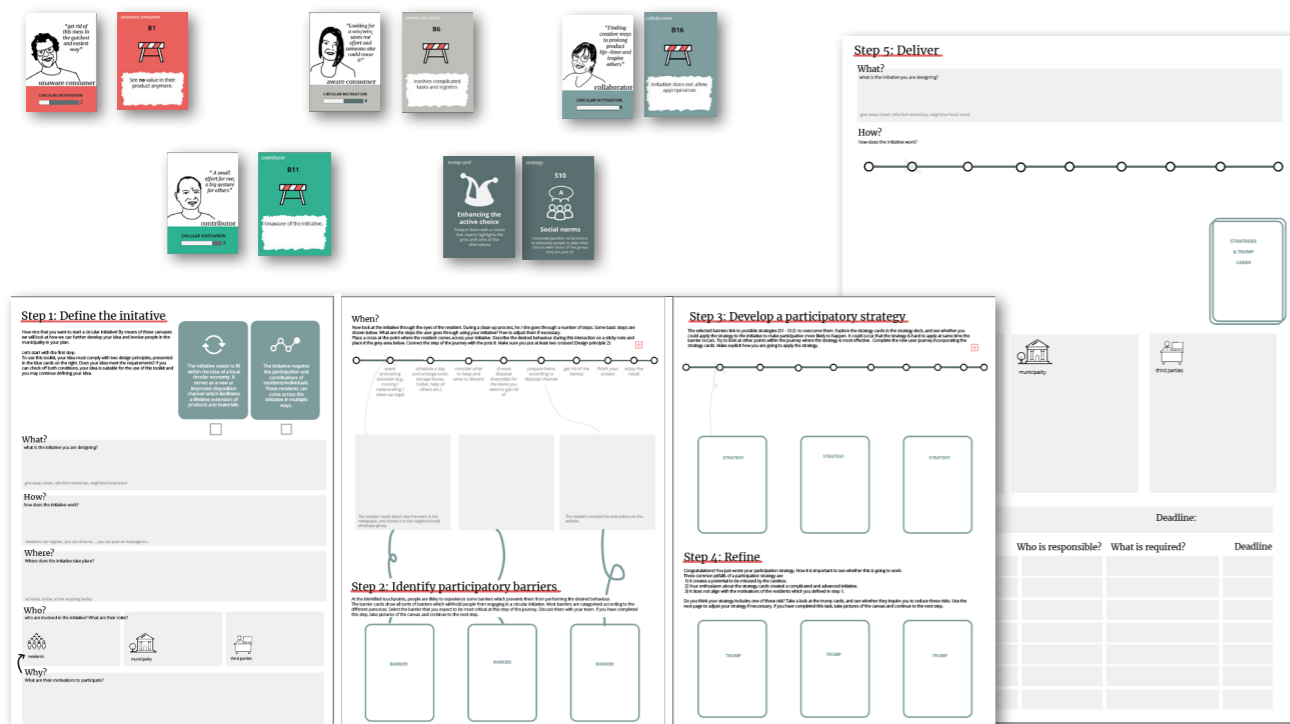*Figure 48 : design principles*

Figure 47 : overview of the toolkit elements

DEFINE THE INITIATIVE 5W1H
If these conditions are met, the team can describe the initiative according to the 5W1H method (van Boeijen and Daalhuizen, 2013). The 'who' request to define the people involved in the initiative. Subsequently, the team needs to define their motivations to participate (why). The 'where' is visualised as a timeline representing the steps the user goes through when utilising the initiative. The canvas asks to describe the desired behaviour at the points of interaction.

IDENTIFY BARRIERS
With the desired behaviour defined, it is time to envision potential barriers for this behaviour. Collaboratively, people look into the barrier cards for inspiration, but can also add new ones themselves. They review which cards prevent the behaviour from happening and which apply best to your envisioned target group. The highest or most severe

barrier is selected. The backside of the card explains the barrier a little bit more and refers to a strategy card which could overcome the barrier (S1-S12).

DEVELOP A PARTICIPATORY STRATEGY
To lower the barriers for participating, behavioural strategies can be applied. At the backside of the selected barrier cards, a reference to a matching behavioural strategy is shown (Figure 49). The team brainstorms about how the barriers could be lowered, using the strategy cards as inspiration. A new journey is drawn up, which includes strategies to enable participation.

Now that a new journey is created, users of the toolkit are warned for three common pitfalls in the design process of participatory initiatives.

1) It creates a potential to be misused by the careless to satisfy personal concerns.

2) The excessive use of strategy cards made a complicated and advanced initiative.

3) It does not align with the motivations of the residents, which were defined in step 1.

Three trump cards are added as inspiration for tackling these pitfalls.
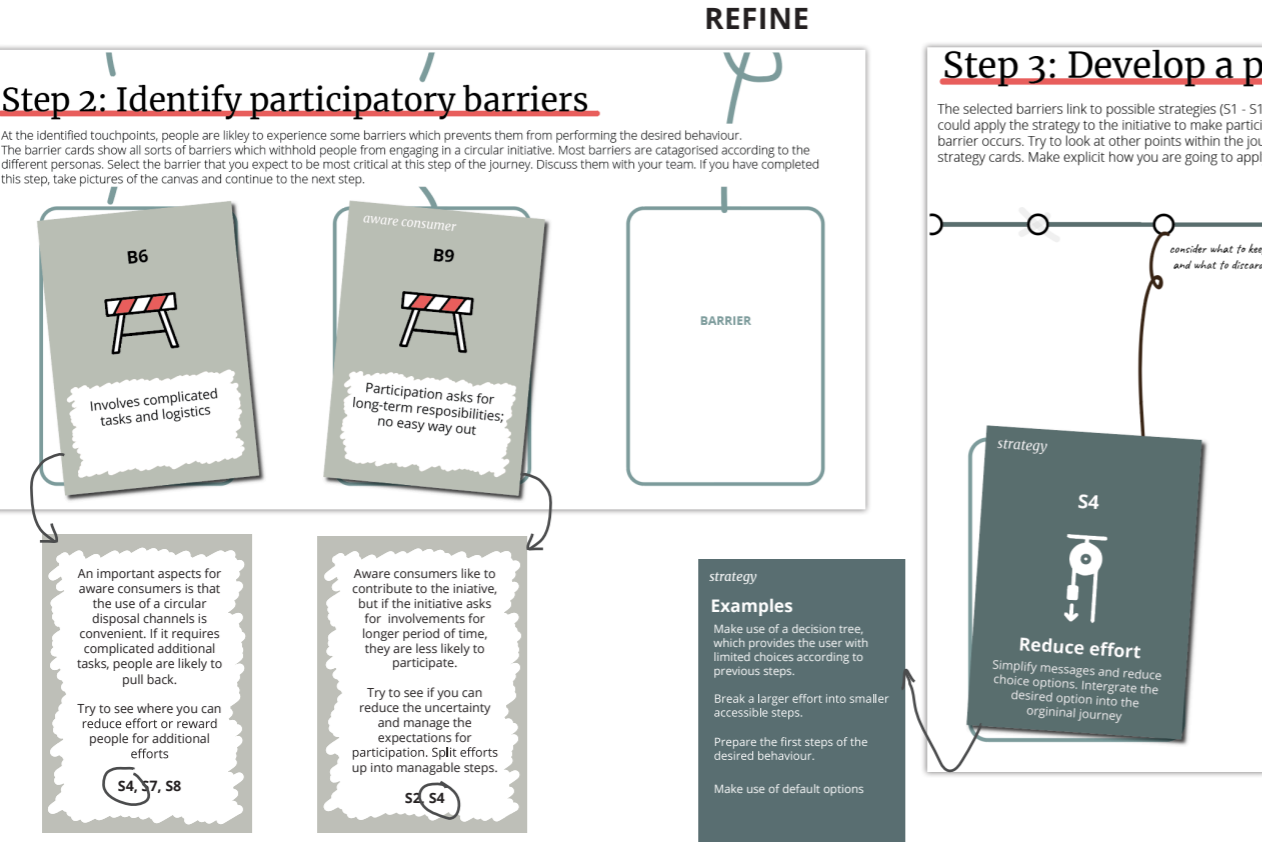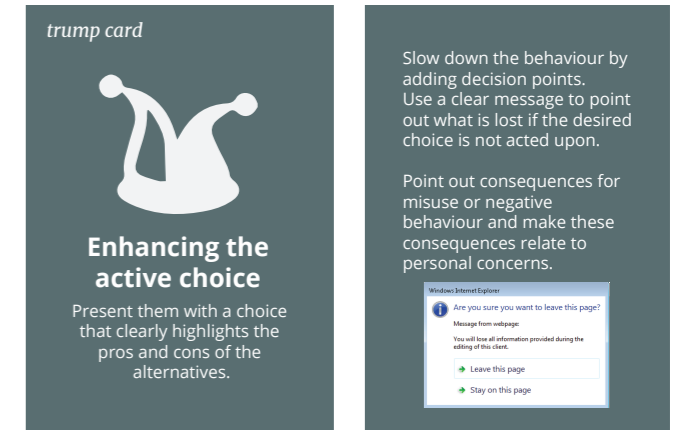
DELIVER
The final canvas combines all information on a big poster. The poster allows outsiders to grasp essential of the initiative quickly and give input as well. At the bottom of the poster, up-following tasks are defined in order to develop the initiative. Important up-following steps are the validation of the ideas and strategies, including the feasibility and viability of the initiative.

REFINE

Figure 49 : The barrier cards with corresponding strategy card. Arrows indicating the back side of the cards.

Figure 50 : Deliver phase; create a poster including the strategies and people involved. Make an actionable plan

2. Evaluation
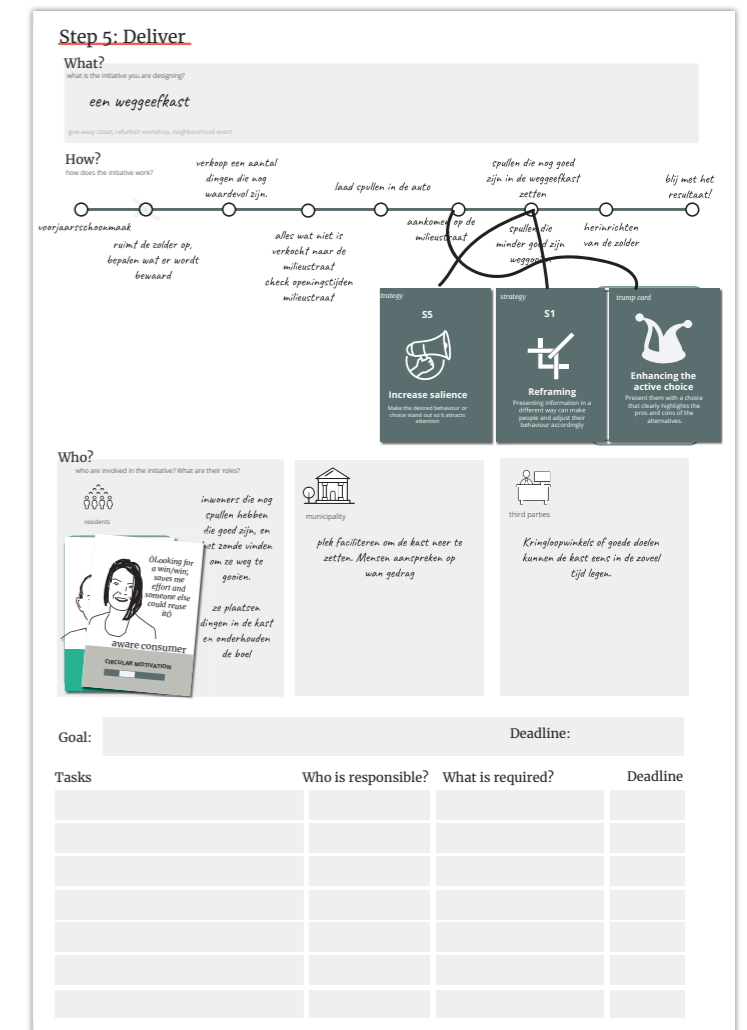
The purpose of the evaluation was to evaluate the effect of the behavioural strategies on the participation of residents. Due to the limited time frame of this project, and the COVID-19 circumstances, not all behavioural strategies could be evaluated.
On August 7th and August 10th, a minimum viable product (MVP) version of the Give-Away closet was evaluated. The cabinet was placed at the municipal recycling facility on a sunny Friday and a Monday. During the evaluation, it was observed whether people feel empowered enough to make contributions to the cabinet by applying several behavioural strategies.

The defined barriers for participation per are shown in figure 51.

The following participatory strategies were evaluated;

REFRAMING
The reframing strategy was applied to make unaware consumers look different upon their products. The Give-Away closet exposes products in appealing ways, while unaware users could only see them as a part of all the other dusting things at their homes. By looking different at their products, the Give-Away closet aims to create a moment of reflection and stimulate them to put items in the cabinet.

REDUCE UNCERTAINTY
Uncertainty is reduced by communicating the rules and procedures of the closet clearly. At the driveway to the recycling facility, people were stopped in front of the barrier to inform them about the pilot that was currently in progress (Figure 53). If people were about to throw something away that could be useful for somebody else, there was now an ability to place it in the Give-Away cabinet. The rules were briefly explained: It was a citizens' initiative set up in collaboration with the municipality and the TU Delft. For now, only products that fitted within the closet could be placed. If they noticed something in the closet there that they could use, they were allowed to take it with them. The cabinet was designed for every person in Heiloo who would like to use it. Residents were in charge!
The rules were also presented on several posters spread around the municipal recycling site (Figure 52). The poster design can be found in Appendix E1.

SOCIAL NORMS
Social norms were used to stimulate people to align their behaviours with the behaviours of the group they consider themselves part of. During the explanation of the initiative, the citizen responsibility was highlighted, also on the poster; this message was clearly conveyed (Figure 52).

DESIGN OPEN STRUCTURES
Not all rules of the initiative were defined. On the poster, there was left a black space for people to complete the rules. Also, in front of the Give-Away-closet, a table was placed that allowed residents to give suggestions or feedback on the pilot. They were told to leave a comment if they had any.

2.1 THE PROCEDURE

The closet was placed in the middle of the industrial site (Figure 54). It was located near employees who supervised the site and answered questions about the destination of products. There were several striking posters on the site, explaining the instructions for the Give-Away cabinet. Except for the information given at the entrance of the facility. No further questions were answered, which could determine whether certain products were good enough to be placed in the closet. This was up to the residents to assess.

If people approached the closet, a conversation was usually started. During this interview, the goal was to find out what the motive of the contribution was. Why did people discard the item in the first place?
What made them change their mind?

Also, they were asked what they thought of the current content of the closet, and whether they felt the need to take something out.

Within the two days, around 15 people made use of the Give-Away closet. Seven people were interviewed and left feedback on the idea.

2.2 RESULTS

Most of the people visiting the recycling facility belonged two the first two groups: unaware consumer or aware consumers. The barrier at the driveway to the recycling facility functioned literally as a moment of friction enhancing the active choice. When explaining the pilot, many people were triggered to think again.

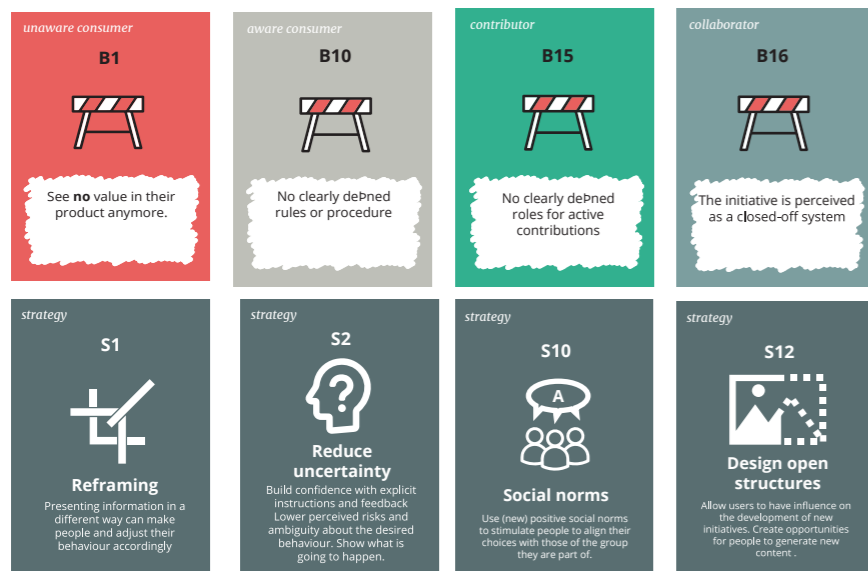| unaware consumer	aware consumer	contributor	collaborator
B1	B10	B15	B16
See **no** value in their product anymore.	No clearly defined rules or procedure	No clearly defined roles for active contributions	The initiative is perceived as a closed-off system
strategy	strategy	strategy	strategy
S1	S2	S10	S12
Reframing Presenting information in a different way can make people and adjust their behaviour accordingly	**Reduce uncertainty** Build confidence with explicit instructions and feedback. Lower perceived risks and ambiguity about the desired behaviour. Show what is going to happen.	**Social norms** Use (new) positive social norms to stimulate people to align their choices with those of the group they are part of.	**Design open structures** Allow users to have influence on the development of new initiatives. Create opportunities for people to generate new content .

Figure 51 : selected barriers and strategy cards

Figure 52 : Poster explaining the rules of the Give-Away closet placed on electronic-waste container

Figure 53 : Explaining the pilot to visitors entering the municipal recylcing facility

Figure 54 : Location of the closet (red circled)

REFRAMING
The cabinet turned out to be an attractive way to trigger a conversation about used products and thereby stimulate reflection. The closet emphasised the usefulness of the items instead of perceiving them as waste. It surprises people what others are were about to throw away.

"I bought something like this [guitar stand] a week ago, and now someone was just throwing one away. Can't be much wrong with things like that. A shame really."

There were also people who did not participate eventhough they still carried useful items. In a conversation with a man, it was clear that he did not see any value in it. It became already valueless, and he decided that he just wanted to discard it. The motivation was too low to change their minds.

REDUCING UNCERTAINTY
Residents turned out to be able to accurately judge whether something could still be of value to someone else. A lot of broken products, construction and garden waste were brought in, but people did not consider to put them in the closet. Also, products that did not fit were naturally not considered as suitable for the closet. The rules of the initiative were manageable and transparent and discussed with the people beforehand. The people who carried something useful and something that fitted within the proportions felt in most cases, empowered enough to place something inside the cabinet. Some people mentioned that they would like to know about the pilot beforehand. They had multiple other stuff and did not know what to do with it yet. They could have taken it with them or the giveaway closet.

It seems like the conversation at the

drive-through was essential to reduce the uncertainty. People did not read the posters and the giveaway closet was not salient enough to catch peoples attention. People who were not informed about the cabinet did not feel empowered enough to put products inside the closet.

SOCIAL NORMS
The shared responsibility of the residents and emphasising the behaviour of others turned out to be less effective. The social norms were emphasised during the conversation. Nonetheless, when the closet was full, only two people felt the responsibility to move things.
Most people did not place their items in the closet when there was a lack of space and just discarded to make use of the recycling facilities. Only one resident felt the need to reorganise the cabinet a bit. In order to make room for her own items, she moved some other stuff up en down. She did not want to cover other products with her items she explained, and everything needs to be clearly visible (Figure 55).
A man who had cleaned up his tennis equipment was approached, asking if he had any things that could be put in the cupboard. 'I think it no longer fits. Is it okay if I put it like this? ' he asked when placing the rackets besides the cupboard. Suggested was to make room by taking something out which he could use or by throwing away something of lesser value.

Figure 55 : Woman putting a jacket in the closet

"I don't feel like this performing this nonsense, and I just want to get rid of this stuff."

He moves several things and stuffed his tennis rackets and shoes with some other products.

There was also an indication that people did not perceive the social norms strategy. Since the employees of the municipality were closeby, some people could felt like the municipality was responsible and watched the closet. This could be assumed since some people were saying; 'There you go!' when placing the items inside the closet. It seems like they were doing the employees or the designer a favour, instead of having the feeling to contribute to the Heiloo'er community.

DESIGNING OPEN STRUCTURES
Several people used the possibility to leave feedback. However, much of it was just 'thumbs up' for the idea of the closet. None of the people who left a note was interested in the further development of the cabinet. Practicality like allowing more oversized items was addressed multiple times. Most people were too busy to involve in the initiative more actively. There seems to be limited interest in the purpose of the closet; people were just happy they could

Figure 56 : Table in front of the closet to leave feedback

discard their items in more responsible ways. A few people mentioned improvements like addressing it on the municipal website, collaborating with thrift stores or moving the closet to the food bank.
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2.3 LIMITATIONS

ONE TOUCHPOINT
The intervention only took place at one touchpoint within the disposal journey. As a result, it is not possible to validate the strengthening effect of multiple strategies that interfere in different places. In some cases, the giveaway closet came in too late, and earlier decisions made them discard the product in irresponsible ways. The decision at the recycling facility is perceived as a less deliberate one. In order to stimulate deliberate decisions, the target audience needs to be addressed earlier during the journey. Furthermore, the intervention is only a snapshot which makes it difficult to measure the long-term effects on disposal behaviour.

CREDIBLE MESSENGER
The explanation about the pilot was given by the designer (me). It is very likely that this also influenced people's willingness to participate. This is what is explained in the credible messenger strategy. Also, the fact that the employees of the recycling facility were located around the cupboard makes people feel that they have to obey some sort of authority. Whether this had a positive or negative effect has not been further investigated or validated, but it is important to take into account when repeating similar experiments.

CLOSING THE LOOP
A pitfall of the Give-Away cabinet at the recycling facility is that people were seduced to place their stuff inside it, but hardly any attention was paid to the stuff in it. In general, people are cleaning up

and want to get rid of things. This could be solved by, for example, donating the items to a thrift store or subsequently offering them online. In this manner, people who are open to new items also come across them. It is essential that the newly defined initiative defined their way to close the loop.

WEATHER CONDITIONS
The intervention was carried out during a weekend in which a heatwave raged across the Netherlands. This made it relatively quiet on the recycling facility since a limited amount of people was tidying up their homes or feel the need to move items when the temperatures raised above 32 degrees. At the recycling facility, they stayed in the car mainly (air conditioning), and they were less willing to engage in a conversation.

2.4 CONCLUSION

LOCATION OF THE INTERVENTION
The majority of people using the giveaway closet can be dedicated to groups of unaware users and passive passers. This was not only because the barriers for participation were low but also had to do with the location the giveaway closet was placed. Many people discarding products at the recycling facility belong to one of these groups. Contributors and Collaborators are more likely to be found at repair cafes, thrift stores or second-hand markets. It is, therefore, important to take the location of the intervention into account when designing participatory initiatives. Is the envisioned target group present?

The earlier defined barriers
1) recognising no value in the product
2) no clearly defined rules or procedures were found present and successfully tackled by the behavioural strategies; reframing and reduce uncertainty.

The other barriers
3) No clearly defined roles for active

contributions
4) initiative is perceived as a closed-off system
are not completely verified with the strategies. The number of contributors and collaborators was limited, and the strategies seem to be addressed at the wrong point in time.

INCREASING MOTIVATIONS OR LOWERING BARRIERS
The intervention played its role near the end of the decluttering journey. At this point, some strategies proof to be more effective than others. The motivation at this point in the journey is relatively low: people just want to get rid of their stuff. Strategies that increase motivations are found to be less effective than strategies which lower barriers. This is shown in the example of the social norms strategy, which aims to increase motivations. This was less effective than reducing uncertainty. If a raise of motivation to participate is desired, it is better to do this upfront when some motivation is already present.

Refer to Appendix E2 and E3 for extra materials on giveaway closet.

3. Recommendations

The evaluation of the Give-Away closet at the recycling facility shows that by identifying barriers and developing a behaviour strategy, participation can be stimulated. Due to the limited time available for this project, there are still several recommendations that are important to consider when developing participatory circular initiatives.

TOOLKIT
First, the use of the toolkit must be validated. It is essential to find out whether the toolkit provides sufficient support for the enhancement of circular initiatives. Are the steps provided by the canvasses supportive enough? Could the toolkit be applied to a wide range of reuse and repair ideas?
A deesigner could facilitate this validation session by and area directors and relevant civil servants to the session. In this way, area directors and civil servants are able to facilitate other sessions in the future.
During the validation the team could make use of the supplied blank cards to identify new barriers and link them to existing or new strategies.

BEHAVIOURAL STRATEGIES
It is also important to determine whether the behavioural strategies offer enough inspiration to improve the initial idea of the circular initiative.
To find out if the strategies fit the moment in time and the person in question, experiments and pilots should be set-up. The evaluation of the Give-Away closet already indicates that strategies that increase motivation are better applied at the beginning of the decluttering journey. These kinds of evaluations are also needed at other steps during the declutter journey so that strategic action can be taken in the future.

FOCUS GROUPS
Focus groups around the development of a circular centre should be established, to make optimal use of the Design for Participation toolkit. These focus groups can be obtained through existing infrastructures such as ikdenkmeeoverheiloo, area directors and citizen initiatives (e.g. Duurzaam Heiloo). It is important to arrange a diverse team and look out for initiative takers.

AFTER THE TOOLKIT
Finally the steps after a new circular initiative rolls off the drawing board, need to be defined. Are the ideas, desirable but also feasible and viable? How do you make an idea actionable so that it obtains a role within the local circular economy in the BUCH? At the bottom of the last canvas an way to define actionable tasks was added. However this remained outside the scope of this project and requires some further elaboration.

4. Implementation

The recommendations already provide the first direction for the future steps to be taken. In this chapter, explains the strategy towards the transition to a local circular economy, with the use of the Design for Participation toolkit.

The implementation strategy is based on the SER model (Fischer, 2011). This model is based on three phases in which participatory initiatives develop; seeding, evolutionary growth and reseeding. The model recognizes that new initiatives have to overcome a particular start-up paradox in which only a few people participate in the initiative.
The initiatives arising from the Design for Participation toolkit can be seen as seeds (Fischer, 2011). These seeds are the initiatives that resulted from a collaboration between residents, initiators and the municipality. They have a certain potential to change and grow, partly through the participation strategies from the toolkit that have been applied. As soon as the initiatives

are realized on a small scale (seeding phase), they are left alone and observed how they develop and possibly attract new contributors (evolutionary growth phase). This is followed by periods in which the initiatives can be improved or restructured (reseeding). Repeating these phases several times creates not only more participation around these circular initiatives but also sets the transition towards a circular economy in motion.

The phases of seeding and evaluation are shown in a rough roadmap.
The letters represent the following groups:

A: meta-designers (municipality)
B: meta-designers, collaborators & consumers (municipality, initiative takers and residents)
C: meta-designers, collaborators, and a growing amount of consumers.
D: meta-designers, collaborators, contributors and consumers.
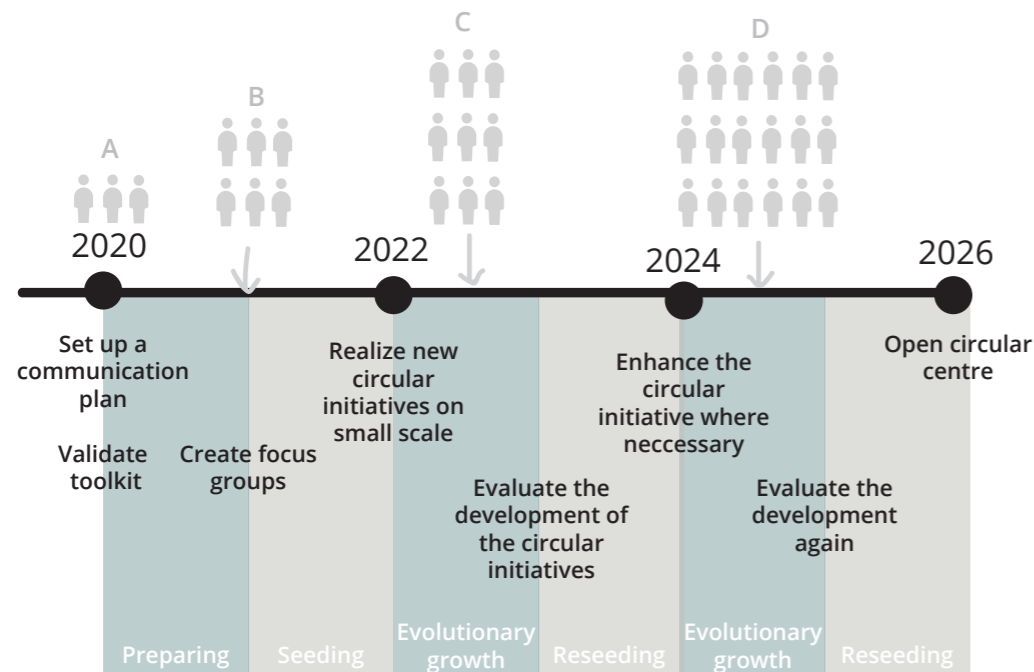
5. Discussion

This project investigated how participation in the circular economy can be encouraged in various ways. The project takes off at the idea of a circular centre; a concept developed by Rijkswaterstaat. Circular centres are municipal recycling facilities, where not only waste is processed but also various recycling alternatives are offered.

The BUCH aims to research how residents view upon the centre and to what extent they can be involved in its implementation. By means of the centre, the BUCH municipalities try to reduce the amount of bulky residual waste and desires to initiate a transition towards a local circular economy. They recognise an essential role for the residents in this respect: behavioural change is required at the individual level.

The literature on behavioural change has been studied thoroughly practising models developed by Fogg (2009), Tromp (2013) and van Lieren (2018). Van Lieren suggests integrating micro-moments of friction to wake people up from their subconscious behaviour and make more deliberate choices. She implies that it is vital to spread nudges and moments of friction across a user journey.
During her graduation project, various principles from behavioural economics were used and incorporated into Behavioral Intervention Strategy Cards. These Strategy cards are the inspiration for the strategy cards from the Design for Participation toolkit developed in this project.

As promising as it sounds, no behavioural strategy washes the deep-rooted behavioural patterns from the take, make, waste away in one go. The transition to a circular economy requires a step-by-step behavioural

change. This project views the transition as a design process, in which an incremental change can be achieved using small iterations (De Koning, Puerari, Mulder, & Loorbach, 2019, p. 4).

By visiting the circular centre in Oss, it was examined how a circular centre contributes to this step-by-step behavioural change. From an interview with the supervisor and a tour, it appears that the centre has only limited incentives for behavioural change. It is mainly organised around efficiency so that visitors rarely get insight into the underlying recycling processes. The visitor's experience is hardly different from a visit to a default municipal recycling facility. The BUCH desires a circular centre in which residents play a greater role. The question, therefore, remains how to let residents participate in more significant ways.

Participation is a broad term and refers to a different mechanism of involving people in decision-making-process(IAP2, 2018). Fischer (2011) describes how environments stimulate participation by assigning different roles; unaware consumers; aware consumers; contributors; collaborators and meta-designers. Fischer (2011) argues that in richer ecology of participation, these roles must be fulfilled. Mechanisms should be designed to facilitate these transitions of people to different roles.

In the empathising phase, research was conducted into the behaviour of residents regarding the disposal of their products. This information was gathered in a qualitative way (interviews) as well as in a quantitative way (questionnaires). This research shows that there are different types of residents, with

C

D

B

A

2020   2022   2024   2026

Set up a
communication
plan

Realize new
circular
initiatives on
small scale

Enhance the
circular
initiative where
neccessary

Open circular
centre

Validate
toolkit

Create focus
groups

Evaluate the
development of
the circular
initiatives

Evaluate the
development
again

Preparing   Seeding   Evolutionary   Reseeding   Evolutionary   Reseeding
growth   growth

different motivations regarding circular behaviour. What is striking is that when looking at how these different motivations can be used in a circular economy, one quickly arrives at Fischer's model in which they all play a different role.

Subsequently, concepts were developed. The concepts focused on the contributor role and applied behavioural strategies to encourage participation. These concepts were assessed by the residents using video prototypes. The upfollowing interviews provided insight into the barriers for participation and the possible strategies that could lower them.

Based on these insights and insights from earlier phases, a toolkit has been developed which helps the municipality to design initiatives together with its residents. The toolkit aims to design interventions that overcome the barriers of participation, and enhance participation on higher levelsw

LIMITATIONS

- This research has focused exclusively on disposal behaviour. No attention was paid to buying and reusing second-hand items. However, this is an essential aspect if the BUCH wants to initiate the transition to a circular economy.

- Due to the research-through-design approach, the attitude of residents towards new circular initiatives is only determined on the basis of three concepts. It is unclear whether these concepts extend the full range of options for circular initiatives. Therefore the strategies cards are unlikely to overcome the entire amount of barriers that are presented during product discarding.

- The majority of findings was based on qualitative data obtained from a limited amount of people. During interviews, no more than four people participated. These people were usually intrinsically interested in the topic and, therefore, do not represent the entire BUCH population.

- Fischer (2011) argues that cultures of participation are less successful when users are brought into the process late (thereby denying them ownership). During this project, residents were not involved in the creation of concepts. This has decreased the potential success of the toolkit.

- The behaviour strategies should only be seen as a helping hand. They must not be applied to enforce people to participate in activities that are personally irrelevant to them.

6. Conclusion

Within the last chapter of this section, the research questions from the first chapter will be answered.

RQ1: Why should the BUCH consider a circular centre?

A circular centre appears to be an efficient way to reduce the amount of bulky residual waste and to increase the number of recycled goods. Nevertheless, to initiate a transition to a circular economy, more is needed than efficient recycling systems.
Within the plans for the circular centre in the BUCH, citizen participation plays a more significant role. Residents are involved in the activities and content of the centre. This means that the success of the circular centre depends on the support that the residents indicate.
At the moment, only a small group of residents appears to be actively engaged in the circular activities. In order to involve more residents in the circular centre, it is essential that their behaviour and attitude regarding circularity changes. Setting up a circular centre seems like a step in the right direction, but in order to initiate behavioural change, it is found to be important to interfere at several touchpoints.

RQ2: How do residents want to contribute to a circular municipality?
Observations, interviews and a survey show that there are different behaviours regarding circular product disposal. Circular behaviour seems to depend on the events that prompt disposition and the tasks and logistics involved. Products which are damaged or broken are usually quickly discarded.
In most cases, most people admit that they consider a limited amount of possibilities before they discard at the municipal recycling facility. Convenience

seems to be an essential factor during discarding. Thrift stores or online Marketplaces are mostly considered because of social or economic motives, rather than sustainable motives.
Even so, there is a small group of residents who are motivated to do more with their old things. Various small citizen initiatives have arisen, and people are taking individual action.
These different behaviours are captured in six personas, which distinguish themselves based on their motivations to act upon a local circular economy.

RQ3: How can design trigger circular participation?

Various ways have been found to stimulate participation in circular initiatives. In the first place, it is essential to define how residents are involved in the initiative. In order to stimulate ecologies of participation, it is important that different roles are created in which people can contribute based on their own motivation. These roles have been identified and projected onto the existing personas in the BUCH. In addition, various barriers to participation have been identified. These barriers can be lowered by means of universal behavioural strategies.
The behavioural strategies can be used to allow people to make a more conscious choice and to provoke certain behaviour. In addition, it is important to design open systems to which residents can give a certain interpretation.
When the design is done together with residents, there is a greater chance that they feel involved in new initiatives, and they are more inclined to take on responsibilities in the transition to a circular economy.

RQ4: What should be offered to BUCH residents to empower them to reduce their amount of bulky residual waste?

In order to reduce the amount of bulky residual waste, de BUCH municipality must involve its residents in the waste problem in a new way. Circular initiatives must be realized which generates support from the residents. To get started with circular initiatives in de BUCH municipalities, this project results in a Design for Participation toolkit. By means of the toolkit, the municipality, initiators and residents can collaboratively create interventions that stimulate reuse of products and materials. By identifying barriers, matching (behavioural) strategies can be used to encourage participation around these initiatives.

VI
REFLECT

This chapter looks back on the activities that were carried out for the result of this project. It highlights both good and less beneficial decisions and provides tips for the future.

1. Project Reflection

This graduation project proved again; you are never done learning. Within this project reflection, some takeaways that can be useful for every design student graduating on a similar topic are listed. Personal reflections are described in the next chapter.

INTRODUCE YOURSELF
It is essential to quickly establish a network of people who could be relevant for your project. Put some effort in introducing yourself at the beginning of the project to several people within the department; this makes it less scary to solicit for some help during the project. Additionally, it becomes easier to find the people with the answers to your questions. Having a better understanding of how the organization works could save you a lot of time.

Officials have busy schedules, so if you want their attention, you should make some effort. Prepare meetings and regularly update them about your progress to keep them involved. When speaking with people, they tend to refer to all kinds of organizations and other people involved. If you feel like they could be relevant for your project, do not hesitate to ask for contact details. Phone numbers are golden: do not wait until someone finds the time to reply to your e-mails. Also, when you are trying to get things done, do not feel afraid to express the urgency.
Looking back at my projects, I could have done this better. Of course, the COVID-19 circumstances did also interfere here. Since I was not able to work at the town hall, I did not naturally encounter people working at the BUCH from time to time and I had to put more effort in contact with officials. Unfortunately, this active attitude was lacking. There were certain moments

where feel like my project was not important enough, and people had better things to do than to spread my questionnaire or make time for an interview.

PROJECT MANAGEMENT
Graduating in collaboration with a public organization requires some project management. It is not the most flexible organization so when you need their help of support with something (spreading questionnaires or executing interventions), it is important to request it on time. Nevertheless, with complex and open-ended design brief like this, it was hard to estimate where things were going. It took me a while to get my head around which 'problem' I was trying to solve and it changed during the project multiple times. As a result, most of the work was done without the help of de BUCH. I see this as a missed opportunity since I believe that involving civil servants in the design process could be a valuable experience for enhancing the way policies are currently designed. If this is something that you aim for it is important to communicate it at the beginning of the project and involve them from the start. Make sure the scope of your project is well-defined. For this project, I hope this report is sufficient in conveying the executed design process.

Pro-tip It is very helpful to bring some extra hands to take pictures and to switch roles from time to time when doing a intervention. A civil servant or area director could be of great help!

INTERVIEW
Interviewing people about their experiences is something that I really enjoy. With the use of a semi-structured interview set-up, you make sure that

there is enough room for people to tell personal stories and can touch upon other questions or situations easily. Your insights become much richer and these stories make the project more fun to work on. However, it is important to keep remembering what you are trying to get to know during an interview. People tend to share all kinds of personal stories which widens the project scope more and more. Almost everyone is performing any form of sustainable behaviour which they often times really like to talk about. You tend to keep asking about these things but be cautious, this easily steers you away from the topic. This is not a problem at the beginning of your project, but there is also a point where you have to go back to the research questions and see whether they are fully answered. If the goal of an interview is to clarify something, a semi-structured interview might not be the way to go. Stick to the questions to prevent things to become more complicated!

Especially when interviewing professionals, I experienced difficulty in steering the conversation towards certain questions that I had. They were professionals, so they know what is important to share with me, right? In some case, this resulted in answers that lacked depth or were incomplete because I did not ask relevant follow-up questions. In order to improve this, you could prepare the interviewee by sending the questions beforehand. In this way, they could already think about answers and it the focus of the interview will shift towards a more in-depth conversation around the answers. By sending the questions beforehand, you also force yourself to check again whether these questions are important to be answered.

ADDRESSING A WASTE PROBLEM
Although waste is a major problem nowadays, it is sometimes difficult to make people enthusiastic to do something about it. Participation

strategies are effective around a topic that is close to the experienced world and where residents feel a need to change it.
Many residents see the waste problem as something that is difficult to grasp and less of personal concern. With the use of a Facebook group and animated movies, I tried my best to engage people in my project from a distance. it turned out that many people are interested (over 40 joined the group), but a little amount was engaging in the discussion. Nevertheless, I believe that conversations and these movies really helped in addressing the problem and enabled people to look different at their old products. A woman told me that before my project she has not heard of the 'Free-to-take-Facebook-group and she was frequently using it ever since! Several people shared that the videos were very clear and some even believed the ideas were already implemented!

2. Personal Reflection

During this design project, I had the opportunity to waken a different designer within myself. After some inspiring electives on civic design and creative facilitation, I was looking for a project where I could put this knowledge into practice. I decided to take the opportunity to graduate at de BUCH: an ambitious design challenge for an undefined context; a circular centre.

Throughout the project, I experienced several ups and downs. The topic really resonated with me, and I found myself diving into literature about circular behaviour, participation and social design. I extended my knowledge and learnt by the day. This gave boosts of energy and enthusiasm for the project.

But then, after five weeks, COVID-19 threw a spanner in the works, and I had to rethink how I was going to approach people. Since I was not allowed to travel to de BUCH or facilitate a co-creation session in real life (which I really wanted to do), I had to come up with alternatives. Unfortunately, residents which I had e-mail correspondence with were not willing to join an online session. My inspiration and energy collapsed. How was I going to design something for BUCH residents if they were not ready to become involved in this topic?
At this point I noticed that I have an unusual way of dealing with blocks; I just continue with things that possibly could make sense. This resulted in a lot of work that was put into making concept movies, presentations and forcing myself to come up with ideas without reflecting on them properly. I kept looking for more and more information. At one point, I was left with so many insights, I did not know where the project was about anymore. Near the end of the project I did not know how to deliver something

that comforts all involved parties. On the one hand, there was the BUCH who initiated the project with a particular intent. De BUCH admired something that they could implement in a circular centre, which is supported by residents. They value practical outcome. On the other hand, there was the university and the academic field, which convinced me to think more in terms of systems and tools. I have always been a practical thinker, so it took me a while to see the bigger picture of my design activities. The green light meeting taught me to look at the things from a higher perspective. This learnt me not to focus on building the perfect intervention but defining the type of intervention and its possible effects. This definitely took my project to a higher level.

All in all, I can proudly say that I survived this graduation roller coaster. It feels weird writing the last sentences of this report after working on it for such a long time. I am grateful for the experience I gained with systemic (meta)-design and design within the public sector. It was a challenging topic with endless perspectives, but I managed to find my way through it! I am putting this pen down now, while looking forward to the new adventures that awaits me.

Till we meet (again)!

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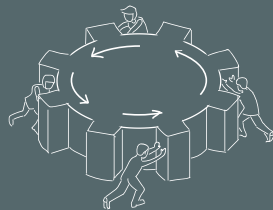
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Design for participation
A CIRCULAR CENTRE IN DE BUCH

MASTER THESIS

FIEKE THIJSSEN
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