

Appendices

Don't let the box out!

A holistic approach to capturing material with recycling potential in the e-commerce sector.



A master thesis by:
Lorena Hurtado Alvarez

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A

Approved project brief

DESIGN
FOR OUR
future


TU Delft

IDE Master Graduation

Project team, Procedural checks and personal Project brief

This document contains the agreements made between student and supervisory team about the student's IDE Master Graduation Project. This document can also include the involvement of an external organisation, however, it does not cover any legal employment relationship that the student and the client (might) agree upon. Next to that, this document facilitates the required procedural checks. In this document:

- The student defines the team, what he/she is going to do/deliver and how that will come about.
- SSC E&SA (Shared Service Center, Education & Student Affairs) reports on the student's registration and study progress.
- IDE's Board of Examiners confirms if the student is allowed to start the Graduation Project.

 **USE ADOBE ACROBAT READER TO OPEN, EDIT AND SAVE THIS DOCUMENT**
Download again and reopen in case you tried other software, such as Preview (Mac) or a webbrowser.

STUDENT DATA & MASTER PROGRAMME

Save this form according to the format "IDE Master Graduation Project Brief_familyname_firstname_studentnumber_dd-mm-yyyy". Complete all blue parts of the form and include the approved Project Brief in your Graduation Report as Appendix 1 !



family name Hurtado Alvarez

initials L given name Lorena

student number 5095336

street & no. _____

zipcode & city _____

country _____

phone _____

email _____

Your master programme (only select the options that apply to you):

IDE master(s): ☐ IPD ☐ Dfi ☒ SPD

2nd non-IDE master: _____

individual programme: - - (give date of approval)

honours programme: ☐ Honours Programme Master

specialisation / annotation: ☐ Medisign

☐ Tech. in Sustainable Design

☐ Entrepreneurship

SUPERVISORY TEAM **

Fill in the required data for the supervisory team members. Please check the instructions on the right !

** chair Rebecca Anne Price dept. / section: DOS/MCR

** mentor Dirk Snelders dept. / section: DOS/MOD


2nd mentor _____


organisation: _____

city: _____ country: _____

comments (optional) _____

Chair should request the IDE Board of Examiners for approval of a non-IDE mentor, including a motivation letter and c.v.

 Second mentor only applies in case the assignment is hosted by an external organisation.

 Ensure a heterogeneous team. In case you wish to include two team members from the same section, please explain why.

APPROVAL PROJECT BRIEF

To be filled in by the chair of the supervisory team.

chair Rebecca Anne Price date - - signature _____

CHECK STUDY PROGRESS

To be filled in by the SSC E&SA (Shared Service Center, Education & Student Affairs), after approval of the project brief by the Chair. The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total: _____ EC

Of which, taking the conditional requirements into account, can be part of the exam programme _____ EC

List of electives obtained before the third semester without approval of the BoE

☒ YES all 1st year master courses passed

☐ NO missing 1st year master courses are:

name _____ date 20 - 03 - 2021 signature _____

FORMAL APPROVAL GRADUATION PROJECT

To be filled in by the Board of Examiners of IDE TU Delft. Please check the supervisory team and study the parts of the brief marked **. Next, please assess, (dis)approve and sign this Project Brief, by using the criteria below.

Does the project fit within the (MSc)-programme of the student (taking into account, if described, the activities done next to the obligatory MSc specific courses)?

Is the level of the project challenging enough for a MSc IDE graduating student?

Is the project expected to be doable within 100 working days/20 weeks ?

Does the composition of the supervisory team comply with the regulations and fit the assignment ?

Content: ☐ APPROVED ☐ NOT APPROVED

Procedure: ☐ APPROVED ☐ NOT APPROVED

comments

name _____ date - - signature _____

Rethinking packaging through logistics for small scale industries

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

start date 25 - 03 - 2021 end date 06 - 09 - 2021

INTRODUCTION **

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

Our current global situation has urged the different industries to adapt the way they provide their services & products, creating a higher demand for home delivery. According to Ecommerce Europe, due to COVID-19, the market of e-commerce providing products under the category of "daily needs" (food, drug store, pet supplies) is perceived to increase sales by 84,2% with a positive public perception of the sector. Moreover, the acceleration of digitalisation of businesses in Europe is noted as a consequence of the pandemic situation, resulting in a continuous growth of the e-commerce sector [2]. The convenience (and now need) of avoiding the brick-and-mortar retail, has turned e-commerce into a lifeline for many traditional stores and has also proven resilience by meeting consumers' increased demand and ensuring the provision of essential goods and services [2].

Aligned with this increase, a new breaking point is envisioned in the packaging system since the consumer experience is now aligned to these changes. Many of these new customers will recognize the convenience of a seamless online buying experience and come to prefer it over shopping in stores [3]. What's more, consumers who had never considered buying groceries online were suddenly left without any other option [3]. Deloitte Netherlands predicts that this trend is likely to continue throughout the next 12 to 18 months, but the chances that it will become permanent are high. Enabling fast, efficient grocery logistics is not possible without appropriate packaging. With the increase in demand of online purchases, comes the increased amount of packaging material over the acquired product. The UN environment programme states that the vast demand for food delivery or takeout and grocery delivery increases Cardboard and plastics waste such as PP, LDPE, HDPE, PET, and PS [6].

An adequate pack that gives consumers the trust that their product has been treated properly, has become the new standard in a positive purchase perception [4]. An increased amount of packaging materials has been one of the immediate solutions to preserve the goods' integrity during transit [5]. Besides, when it comes to managing perishability (specifically temperature-sensitive items, for 24 or 48 hours), logistics services are only willing to deliver for prices that can go up to 30€ per box when parcels weigh around 5-10kg. Additionally a minimum order quantity of 100 deliveries per year is required for the use of their services [8].

This price is very high for start-ups and small businesses that are trying to come up in the sub-scale e-commerce scene. Parallely, there is a lack of a personalized operation in context of packaging logistics that can help them to enabling fast and fresh delivery [5]. In Netherlands, Independent food retail stores are increasingly leaving the scene due to shrinking margins, growing online sales, on-going consolidation, and sustainable demands, despite its significant representation (20%) within the market [9]. Hence, there is a significant need for a solution that supports the subscale industry to be viable and sustainable in context of e-commerce through packaging logistics.

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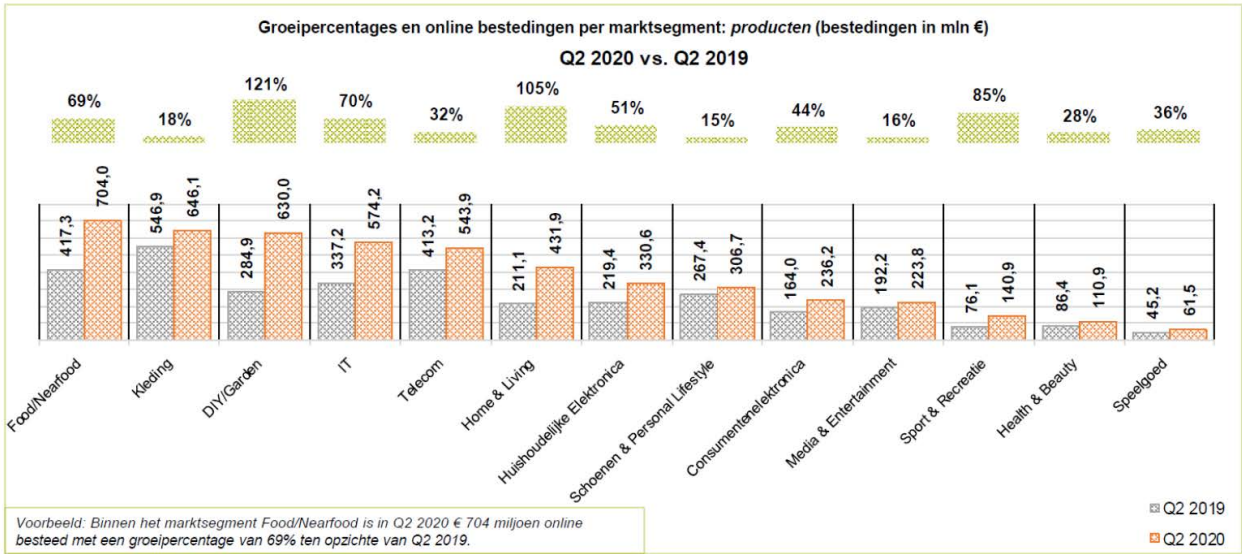


image / figure 1: Dutch online consumer expenses (Welie, 2020)

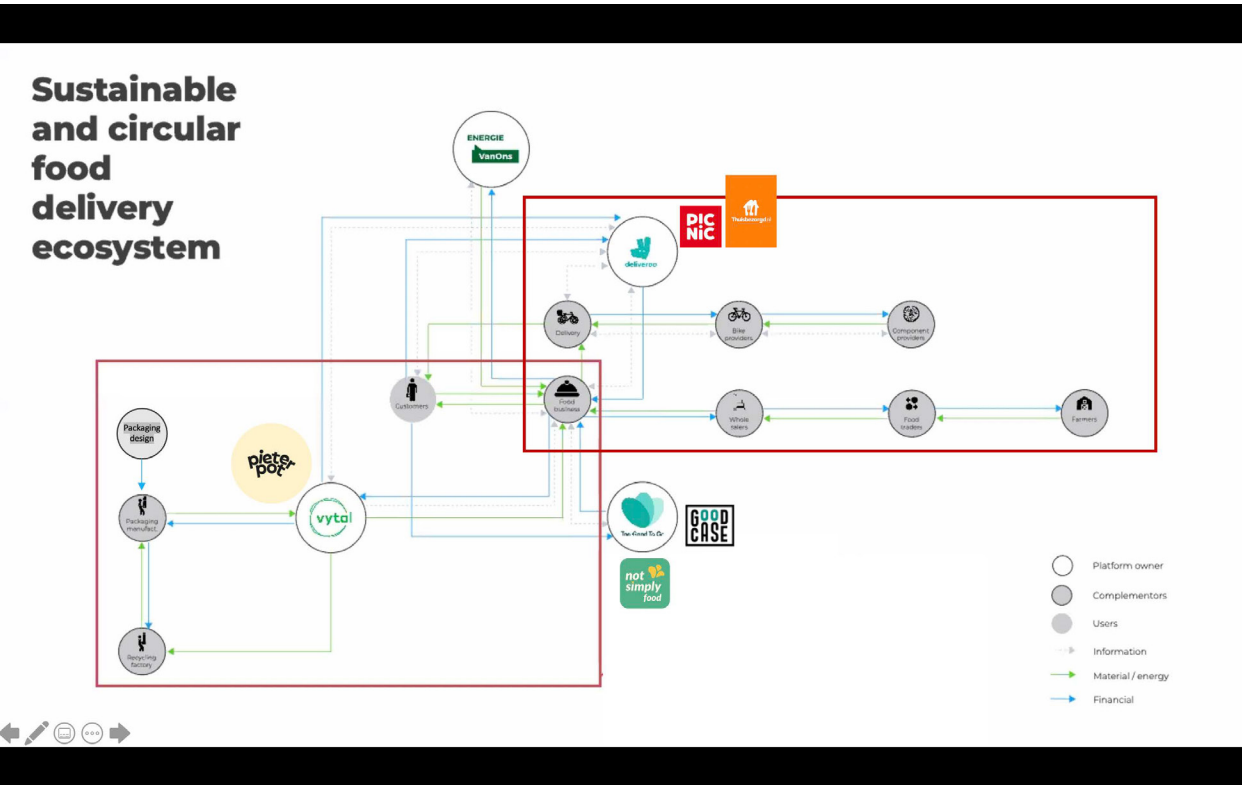


image / figure 2: Retrieved from Jan Konietzko's Lecture SSBM, 2021. Highlighting the area of research

PROBLEM DEFINITION **

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

The logistics rate is high for start-ups and small businesses that are trying to come up to the sub-scale e-commerce scene, and when it comes to optimize their packaging, a new issue results from the lack of a personalized operation that help them to enabling fast and fresh delivery [5]. With this project, I will analyse the logistics needs of small businesses (considered my main stakeholders) with the objective to find a solution that allows the advice, personalization and transport of their products in an accessible way. The outcome will result in a new service with a business model that can be profitable for the stakeholders involved in the process, achieving the goal for reducing shipping costs and will prevent packaging waste.

Due to the time and scope of the project, food waste will not be considered into the scope as a main issue to tackle, nonetheless with the assurance of packaging and logistics this problem could be reduced.

The research question of this project will be: "How to design a service that can prevent packaging waste and help subscale ecommerce in the food sector to deal with their logistics?"

Sub question: How to design the strategy of this new service with a business model that can be profitable for all the stakeholders?

ASSIGNMENT **

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

A delivery service that can be personalised for start-ups and small businesses that can be profitable for the stakeholders involved in the process, achieving the goal of reducing shipping costs and preventing packaging waste.

In order to capitalize the specific needs related to packaging and logistics, I will contact start-ups and independent food retailers and create a costumer need assessment that may help me to create the structure of the personalization of the packaging. Actors such as cardboard retailers or suppliers with returnable solutions must be researched as well. From the context part, a review on the business models of food delivery and package delivery must be studied. With all this information, the creation of a new service will be set. Value proposition and DNA must be addressed. A research on economy of sub-scales must be performed to understand how to make this service suitable and profitable for all parties.

PLANNING AND APPROACH **

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date 25 - 3 - 2021 6 - 9 - 2021 end date



Phase 1 is dedicated to exploring the context & stakeholders. The information about the context and the contact with the different stakeholders will be performed in this phase.

Phase 2 will be the moment to co- create the best solution for the clients. The information will

Phase 3 is the moment to create the platform that will provide guidance. Based on the insights from the coherent vision building.

A one week holiday is planned in the month of July (Week 17).

Although the Chart shows 25 weeks, the planning takes into account public holidays in certain weeks. Two recharging weeks are considered in the project. The number of days are leading to count the 100 working days for this graduation project.

Due to COVID I will be executing this project at Home in an Online Setting.

(A better view of the planning can be found attached)

MOTIVATION AND PERSONAL AMBITIONS

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

Inspired by my experience executing packaging projects, and the continuous questions I got from people that don't understand why packaging is not changing rapidly, I decided to approach my project to the ones that can't get this support because of the size of their businesses. Then, translating those opportunities into a service that will prevent packaging waste, will help me to deep dive into the theory of upstream innovation but translated into a small scale as well as the theory of service design.

Last, I will apply for the SVM packaging and environment scholarship, and If I get the funding, I would like to launch this service. Anyone involved in packaging knows that optimizing its processes is more complex than many people think. It involves many stakeholders from the product and from the system. I believe that packaging is only good when it fulfills its function and work in the whole supply chain, but also when it completed its purpose of contain, protect and transport.

On the other hand, this project will challenge my communication skills:

- Writing: In general, writing is one of the skills that cost me the most. I find challenging to place my ideas only with words. With this last project, I will explore the best way to unwind my writing skills.

- Research skills: I want to keep on practicing my qualitative and quantitative skills and the right way to document this process and extract the insights properly.

- The value of resilience: Being in times of difficulty during COVID may expose my capacity for resilience. I would like to keep on working on a personal level about how to remain inspired and connected with my passions and don't let external situations made me doubt my confidence in my knowledge and skills.

Resources:

1. Packaging, C. (2020, January 13). The History of Packaging | Crawford Packaging Blog. Retrieved from

<https://crawfordpackaging.com/automation-and-innovations/history-of-packaging>

2. Ecommerce Europe. (2021, January). Impact of the Coronavirus on e-commerce (1). Retrieved from

<https://www.ecommerce-europe.eu/wp-content/uploads/2021/01/Coronavirus-Survey-Report-January-2021.pdf>

3. Deloitte Netherlands. (2021, February 24). COVID-19 and the food industry. Retrieved from

<https://www2.deloitte.com/nl/nl/pages/consumer/articles/food-covid-19-and-the-food-industry.html>

4. Schwager, A. (2018, October 4). Understanding Customer Experience. Retrieved from

<https://hbr.org/2007/02/understanding-customer-experience>

5. DHL Customer Solutions & Innovation. (2020). Rethinking packaging: A DHL perspective on the future of packaging in the logistics industry. Retrieved from

<https://www.dhl.com/content/dam/dhl/global/core/documents/pdf/glo-core-rethinking-packaging-trend-report.pdf>

6. UN environment programme. (2020). SUSTAINABLE LIFESTYLES FOR PLASTICS AND PACKAGING WASTE

MANAGEMENT DURING A PANDEMIC. Retrieved from

https://ec.europa.eu/environment/international_issues/pdf/01-06%20-%20Mushtaq%20Ahmed.pdf

7. Investopedia. (2021, January 17). Economies of Scale. Retrieved from

<https://www.investopedia.com/terms/e/economiesofscale.asp>

8. PostNL. (n.d.). Verzendkosten pakket. Retrieved from

<https://www.postnl.nl/tarieven/tarieven-pakketten/Pakket/NL/5-10kg>

FINAL COMMENTS

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

B Desk research library

A desk research library was created during my research of the context and reviewing all the actors involved in the waste disposal system. Here you can find the relevant keywords and the link to access the information.

This library also served as a centralized source of information for all the phases described in my thesis.

Access Library

Circularity

- ✓ Circular business models, design strategies, fast moving consumer goods.
- ✓ Circular economy, collaboration, innovation
- ✓ Circular economy, from linear to circular
- ✓ Circular strategy Rotterdam municipality

e-commerce

- ✓ e-commerce
- ✓ e-commerce, consumer perception
- ✓ e-commerce, consumer returning behaviour
- ✓ E-commerce, logistics, packaging, warehousing, big data,
- ✓ e-commerce, marketing, digitalized-packaging
- ✓ e-commerce, packaging, logistics
- ✓ e-commerce, returns,
- ✓ e-commerce, small business,
- ✓ e-commerce, small business, digitalization

Eco-behaviour

- ✓ Eco-symbols
- ✓ Food retail, Dutch statistics
- ✓ Future scenarios, packaging
- ✓ Government, SMEs, Netherlands, entrepreneurship
- ✓ Green choices
- ✓ green label, consumer behaviour
- ✓ Grocery store, e-commerce
- ✓ Material substitution, wood based material
- ✓ Motivations for change, sustainability

Tools & methods

- ✓ Ideation Narrative
- ✓ LCA, C2C, circular economy
- ✓ Motivations for change, sustainability
- ✓ Open Innovation
- ✓ Sustainable business models, organizational deisgn
- ✓ Sustainable value creation
- ✓ Systemic design
- ✓ Toolkit, circular economy
- ✓ Tools, circular innovation ecosystems
- ✓ Tools, visualization of concepts
- ✓ Sustainable business models
- ✓ Sustainable business models, 'ecology of business' models,
- ✓ Sustainable business models, organizational deisgn

Packaging & recycle

- ✓ Packaging, waste
- ✓ Paper recycling System issue
- ✓ Plastic substitution to paper based packaging
- ✓ Pulp, packaging, collecting
- ✓ Reciclability, product design
- ✓ Recyclability, materials, cardboard
- ✓ Recycling rates
- ✓ Requeriments of packaging in the Netherlands
- ✓ Reverse logistics, packaging bottle, re-use

Supply chain

- ✓ Supply Chain decarbonization
- ✓ Supply cycle thinking, packaging, circular economy
- ✓ Reverse logistics, packaging bottle, re-use

Waste

- ✓ Waste
- ✓ Waste disposal
- ✓ Waste disposal, system analysis
- ✓ Waste management, sustainable goals
- ✓ Waste, packaging, government, e-commerce
- ✓ Waste, pulp, packaging
- ✓ Wood cycle

https://docs.google.com/spreadsheets/d/1hKtCTqnAO0OYLK90FrmsQUCz8-_llpHO/edit?usp=sharing&ouid=114170842633994403782&rtpof=true&sd=true

C Interview guide, quotations & coding

Gavin Mounce (E-commerce packaging design at Ds Smith)

Introduction

“Thank you for accepting this interview, my name is Lorena Hurtado and your insight are important for my project related to parcel shipping of consuming goods.

Is it ok that this conversation is being recorded? All information provided will be use for the development of this project, and it will remain confidential.

As I mentioned in the brief, this project will aim to enabling fast, efficient grocery logistics of fresh food and products through an appropriate packaging.

With the increase in demand of online purchases, comes the increased amount of packaging material over the acquired product. The UN environment programme states that the vast demand for food delivery or takeout and grocery delivery increases Cardboard and plastics waste such as PP, LDPE, HDPE, PET, and PS [6].

Today I would like to talk to you about this transformation, and how do you see packaging design can be accessible and involved in the process of SME’s.

Could you describe to me the process of developing a personalized packaging?

How long it might take to have the final proposal?

I am assuimg your actual services have been helping big clients, do you see a possibility to help small ones?

As Ds Smith, do you see an alternative/option that can be suitable for this target group (SME’s / Startups)?

Then, do you see a way we can communicate and promote a correct packaging disposal?

ATLAS.ti Report

Thesis project

Quotations

Report created by Lorena Hurtado on 21 Sep 2021

1:1 we saw a massive increase. And then during the pandemic, there was obviously a huge, huge increase o...

Coding:

- o food online
- o pandemic request

Content:

we saw a massive increase. And then during the pandemic, there was obviously a huge, huge increase of people wanting to ship food online

1:2 the local delivery businesses, which have just kind of picked up on like trays and kind of boxes and...

Coding:

- o local delivery
- o Pick up

Content:

the local delivery businesses, which have just kind of picked up on like trays and kind of boxes and easy to carry things like that

1:3 And now there's a number of businesses, there's things like honeycomb cardboard, we tried papers, th...

Coding:

- o material exploration

Content:

And now there's a number of businesses, there's things like honeycomb cardboard, we tried papers, there's even paper insulation, those, there's cornstarch, which is one that Dr. Smith's work in ways. So this is some these are all curbside recyclable. So this is what's really of interest for the sustainable.

1:4 people are becoming very aware of the active columns.

Coding:

- o consumer awareness

Content:

people are becoming very aware of the active columns.

1:5 launched around three to four years ago, a webshop, called dsms e pack. And this, the idea of this w...

- Coding:**
- Packaging solution for small business

Content:

launched around three to four years ago, a webshop, called dsms e pack. And this, the idea of this was to take some of our good designs, our hero designs, and they are then produced in a higher volume. And they are stored in a warehouse. And then we sell in, I think anything like 510s 20s and things like that. So what it does is it allows customers access to more customized designs, and ones that would have cost a lot more in development or design knowledge, etc. and been in the supply chain, and also non standard.

1:6 they don't have to pay for origination plays, no tooling costs or anything like that. And they can j...

- Coding:**
- Advatage of Ds Smith webshop

Content:

they don't have to pay for origination plays, no tooling costs or anything like that. And they can just buy the boxes that they need.

1:7 I think we will be selling these insulation boxes in smaller volumes on the webshop with bought a co...

- Coding:**
- Business opportunities

Content:

I think we will be selling these insulation boxes in smaller volumes on the webshop with bought a contract because you had to buy a container. So like a whole shipping container in one go. So I think we've bought a shipping container. And we're bringing this product to the smaller businesses.

1:8 I know that we we opened in the UK. So we've got the UK site here, but I know that we're opening in...

- Coding:**
- Business opportunities

Content:

I know that we we opened in the UK. So we've got the UK site here, but I know that we're opening in to other countries.

1:9 if you're dealing with like a global brand, like Unilever or Mars, and it has to go through differen...

- Coding:**
- Time of development big companies

Content:

if you're dealing with like a global brand, like Unilever or Mars, and it has to go through different like teams and things like that, it can take anything up to 12 months to launch, you know, like a whole range of products or things like that

1:10 If you bring it down to like more smaller scale projects, some of those can be two to three months,...

- Coding:**
- Time of development small companies

Content:

If you bring it down to like more smaller scale projects, some of those can be two to three months, for smaller projects for large brands.

1:11 I was in the supermarket earlier this morning and even on the cereal packets, it said, you know, ple...

- Coding:**
- Packaging communication to consumers

Content:

I was in the supermarket earlier this morning and even on the cereal packets, it said, you know, please recycle me and stuff like that. So there's a lot more communication that people are writing, I think on Amazon it says, you know, this packaging is made from recycled packaging and can be recycled.

1:12 I think the mentality that we've got of a lot of people is they do know that corrugated recycles. An...

- Coding:**
- Consumer perspective around paper based packaging

Content:

I think the mentality that we've got of a lot of people is they do know that corrugated recycles. And that's, that's probably a an easy thing for us as a manufacturer.

1:13 Because people that live in like apartments or flats or very small storage space, if you've got thes...

- Coding:**
- Help consumer to recycle trough packaging design

Content:

Because people that live in like apartments or flats or very small storage space, if you've got these huge boxes that you can't break down very easily, people get very frustrated with them. So for us, as a designer, we we are looking very much trying to make the things easy to recycle, easy to break down.

1:14 it's not just so much about the message of recycling, this is about actually reducing the sheer amou...

	<div>Coding: <ul style="list-style-type: none"> Reduce over-use of packaging </div> <div>Content: <p>it's not just so much about the message of recycling, this is about actually reducing the sheer amount of material you use as well to, to make it easier for the customers are more friendly.</p> </div>
<div>1:15 we had contracts, we have contracts with supermarkets, so that we supply the boxes to the supermarke...</div>	<div>Coding: <ul style="list-style-type: none"> reverse logistics networks </div> <div>Content: <p>we had contracts, we have contracts with supermarkets, so that we supply the boxes to the supermarket. And then we collect the same boxes that we make and return them back</p> </div>
<div>1:16 contaminated cardboard, obviously, if it's got like food on it or other things, it's quite difficult...</div>	<div>Coding: <ul style="list-style-type: none"> Contaminated carboard </div> <div>Content: <p>contaminated cardboard, obviously, if it's got like food on it or other things, it's quite difficult.</p> </div>
<div>1:17 one of the biggest problems during the pandemic was that there wasn't so many shops that we would no...</div>	<div>Coding: <ul style="list-style-type: none"> Lack of cardboard collection </div> <div>Content: <p>one of the biggest problems during the pandemic was that there wasn't so many shops that we would normally be collecting from.</p> </div>
<div>1:18 there was a real shortage of good quality fiber,</div>	<div>Coding: <ul style="list-style-type: none"> Lack of cardboard collection </div> <div>Content: <p>there was a real shortage of good quality fiber,</p> </div>
<div>1:19 we do is we have a closed loop system essentially, to ensure that we collect the quality of material...</div>	<div>Coding: <ul style="list-style-type: none"> reverse logistics networks </div> <div>Content:</div>

	<div>we do is we have a closed loop system essentially, to ensure that we collect the quality of material.</div>
<div>1:20 we've got a very complex ways of checking, you know, the material that comes in, but they check the...</div>	<div>Coding: <ul style="list-style-type: none"> quality of the recycled material </div> <div>Content: <p>we've got a very complex ways of checking, you know, the material that comes in, but they check the moisture contents, they check the the kind of quality of it.</p> </div>
<div>1:21 it's like gold to dsms that fiber</div>	<div>Coding: <ul style="list-style-type: none"> Business opportunities quality of the recycled material </div> <div>Content: <p>it's like gold to dsms that fiber</p> </div>
<div>1:22 we have the plastic river strip, and people are not sure what to do once they rip that Office got pl...</div>	<div>Coding: <ul style="list-style-type: none"> Contaminated carboard quality of the recycled material </div> <div>Content: <p>we have the plastic river strip, and people are not sure what to do once they rip that Office got plastic on it.</p> </div>
<div>1:23 they don't know whether to put that into cardboard or whether they kind of dispose of it.</div>	<div>Coding: <ul style="list-style-type: none"> Doubts of consumers to dispose a material Packaging communication to consumers </div> <div>Content: <p>they don't know whether to put that into cardboard or whether they kind of dispose of it.</p> </div>
<div>1:24 Ripper tapes.</div>	<div>Coding: <ul style="list-style-type: none"> Business opportunities Help consumer to recycle trough packaging design </div> <div>Content: <p>Ripper tapes.</p> </div>

1:25 t's incredibly important because the box cost is about 50% material.

- Coding:**
- quality of the recycled material

Content:

t's incredibly important because the box cost is about 50% material.

1:26 the more fiber that we can reclaim and recover, and even for the customer, you know, it's a selling...

- Coding:**
- quality of the recycled material
 - reverse logistics networks

Content:

the more fiber that we can reclaim and recover, and even for the customer, you know, it's a selling point that the less fiber they need, and the better performing the pack is, the better it is for the customer as well.

1:27 there are some articles about in the last six months, there was a shortage of fiber and talks about...

- Coding:**
- Shortage of recycled fiber

Content:

there are some articles about in the last six months, there was a shortage of fiber and talks about recycling.

1:28 he import and export of fiber, because I know that you know, pre pandemic, I think there was probabl...

- Coding:**
- Exporting and importing recycling material

Content:

he import and export of fiber, because I know that you know, pre pandemic, I think there was probably more of a surplus of paper.

1:29 before we knew it, the the production and reels of paper available, were actually less than the dema...

- Coding:**
- Lack of recycled fiber

Content:

before we knew it, the the production and reels of paper available, were actually less than the demand that was being required.

1:30 like a professional company to come and collect it, you have to have a license carrier to pick up th...

- Coding:**
- Exporting and importing recycling material

Content:

like a professional company to come and collect it, you have to have a license carrier to pick up the waste, and take it away.

1:31 every home has to pay the council tax

- Coding:**
- Waste collection

Content:

every home has to pay the council tax

1:32 that gets taken by the Council, and then it all the contract for the council. And then they take tha...

- Coding:**
- Business behind waste

Content:

that gets taken by the Council, and then it all the contract for the council. And then they take that. And it's not collected by someone like Dr. Smith, and they can either sell it, because then that helps, obviously, their cost of collection, things like that.

1:33 the council's collecting a lot more as a waste, it wasn't coming back quick enough to people like Dr...

- Coding:**
- Business behind waste
 - quality of the recycled material
 - Waste collection

Content:

the council's collecting a lot more as a waste, it wasn't coming back quick enough to people like Dr. Smith, it had to go back to a facility, then it had to be sorted, then it had to be bailed and then it had to be transported or things like that.

1:34 the pandemic is probably quite an interesting situation for your case, you know, to look at, because...

- Coding:**
- Packaging system transformation

Content:

the pandemic is probably quite an interesting situation for your case, you know, to look at, because it's caused a unique change in the system.

 **1:35 sometimes fiber has been imported and export it and you know, kind of like Recycling's even been exp...**

- Coding:**
- Exporting and importing recycling material
 - quality of the recycled material
 - Shortage of recycled fiber

Content:
sometimes fiber has been imported and export it and you know, kind of like Recycling's even been exported and things like that. So, it would be definitely worth investigating and kind of understanding, you know, a bigger picture of what that means.

 **1:36 they said those investigations into like either unboxing the product at the door, and then the couri...**

- Coding:**
- reverse logistics networks

Content:
they said those investigations into like either unboxing the product at the door, and then the courier takes the box away. And because the courier vans returned to the hub empty, so you know, they would be a prime route really, if it could be cost effectively, or the biggest problem with them is time.

 **1:37 the parcel could knew that someone was coming to collect and then the courier literally**

- Coding:**
- reverse logistics networks

Content:
the parcel could knew that someone was coming to collect and then the courier literally

 **1:38 the person left the corrugated outside the door bundled or something in some way that it was just cl...**

- Coding:**
- quality of the recycled material
 - reverse logistics networks

Content:
the person left the corrugated outside the door bundled or something in some way that it was just cleaning easy, but the guy could put it back in the van. And he could take back, they would be a perfect collector of so much waste because the vehicles already on the road, it's returning empty, probably well, at least 90% empty,

 **1:39 they don't want their drivers to stop or is going to delay them in any way.**

- Coding:**
- Constrains in reverse logistics

Content:
they don't want their drivers to stop or is going to delay them in any way.

 **1:40 five and 15 spins, whereas ecommerce have anywhere up to 50 touch point,**

- Coding:**
- Difference between channels

Content:
five and 15 spins, whereas ecommerce have anywhere up to 50 touch point,

 **1:41 've got a friend in Germany that has a dog treat subscription service. And so she's a small, a very...**

- Coding:**
- Business opportunities

Content:
've got a friend in Germany that has a dog treat subscription service. And so she's a small, a very small business startup. And she actually has, like, you've got there a logistics company, they pick, pack and send all her products. So he basically only interacts with the customers through email, and the website takes a transaction, etc. Yeah, but she, she's only small and she works out that would be more cost effective for a logistics company.

 **1:42 third party logistics.**

Content:
third party logistics.

 **1:43 they can either, you know, pick pack, you know, whatever, whatever your needs are really**

- Coding:**
- Third party logistics

Content:
they can either, you know, pick pack, you know, whatever, whatever your needs are really

 **1:44 There's even autonomous vehicles like they're running in the UK at the moment.**

- Coding:**
- Business opportunities
 - Green logistics

Content:
There's even autonomous vehicles like they're running in the UK at the moment.

 **1:45 DPD have got electric vehicles in the UK for small parcels. I saw in Barcelona they had like a bicyc...**

Coding:
◦ Green logistics

Content:
DPD have got electric vehicles in the UK for small parcels. I saw in Barcelona they had like a bicycle. I think I even got a picture.

 **1:46 So they can take out from the local hub, they deliver it by van, take it back, you know deliver, tak...**

Coding:
◦ Constrains in reverse logistics

Content:
So they can take out from the local hub, they deliver it by van, take it back, you know deliver, take it back, deliver take it back, then it goes back to the product manufacturer. And by this time, it can easily have up to 50 different kinds of life impacts on knocks or you know, the complexity. And then you've even got like cross border.

 **1:47 Then you have the channel specific where we talk about the performance, so you use less material to...**

Coding:
◦ Packaging performance

Content:
Then you have the channel specific where we talk about the performance, so you use less material to create a better performance pack.

 **1:48 people are looking to like omni channel so that they have one box for all channels, so they're not h...**


Coding:
◦ Packaging performance

Content:
people are looking to like omni channel so that they have one box for all channels, so they're not having to like rewrap things, etc.

 **1:49 this is the next generation, which is kind of where people are really challenging, even corrugated c...**

Coding:
◦ Packaging performance

Content:
this is the next generation, which is kind of where people are really challenging, even corrugated cardboard, are challenging everything.

 **1:50 design materials technology, and what you're talking about the supply side as well. So we're kind of...**

Coding:
◦ Packaging system transformation

Content:
design materials technology, and what you're talking about the supply side as well. So we're kind of looking into all of all of those details.

 **2:1 There was no system behind before and now we have this WooCommerce.**

Coding:
◦ Tools for startups

Content:
There was no system behind before and now we have this WooCommerce.

 **2:2 that's a small boxes that you can fit through the slit in your front door.**

Coding:
◦ Packaging performance

Content:
that's a small boxes that you can fit through the slit in your front door.

 **2:3 Because it's a little cheaper.**

Coding:
◦ Packaging convenience

Content:
Because it's a little cheaper.

 **2:4 we started to make the concepts in the way to fit these boxes, because it's the cheapest way to ship...**

Coding:
◦ Packaging convenience

Content:
we started to make the concepts in the way to fit these boxes, because it's the cheapest way to ship in the Netherlands apparently.

 **2:5 it still would still be more expensive if you if you have a bigger box**

Coding:
◦ Packaging convenience

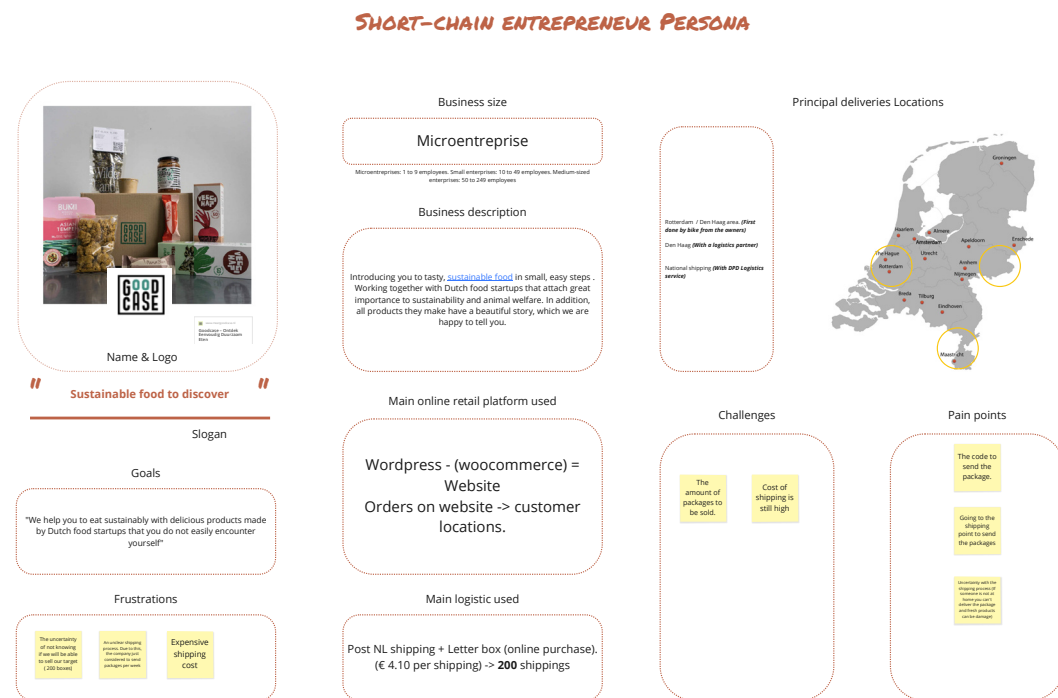
Content:

	it still would still be more expensive if you if you have a bigger box
☰ 2:6 I'm not sure actually. Maybe we should look into this.	
Coding:	<ul style="list-style-type: none"> ◦ Doubts in shipping process
Content:	I'm not sure actually. Maybe we should look into this.
☰ 2:7 So we are in contact with these companies, but but usually we use package sizes that are already ava...	
Coding:	<ul style="list-style-type: none"> ◦ Packaging convenience
Content:	So we are in contact with these companies, but but usually we use package sizes that are already available. Okay. Yeah, saying that the quantities are too low that they would they wouldn't make custom packaging for us. I think
☰ 2:8 the first two trials that we did we only ship there because we the first one we did ourselves by bik...	
Coding:	<ul style="list-style-type: none"> ◦ local delivery ◦ Packaging convenience ◦ Third party logistics
Content:	the first two trials that we did we only ship there because we the first one we did ourselves by bike and the second one we had this delivery partner from the Hague who only ships in this area and then the third trial we sit with DPD
☰ 2:9 we ordered 100 products because we were not sure if we can even sell 200 so we first ordered 100 of...	
Coding:	<ul style="list-style-type: none"> ◦ Business uncertainty
Content:	we ordered 100 products because we were not sure if we can even sell 200 so we first ordered 100 of each
☰ 2:10 So we have a QR code on the on the cards. I think should be because our like the content Part of the...	
Coding:	<ul style="list-style-type: none"> ◦ food online ◦ Outboxing experience ◦ Packaging communication to consumers

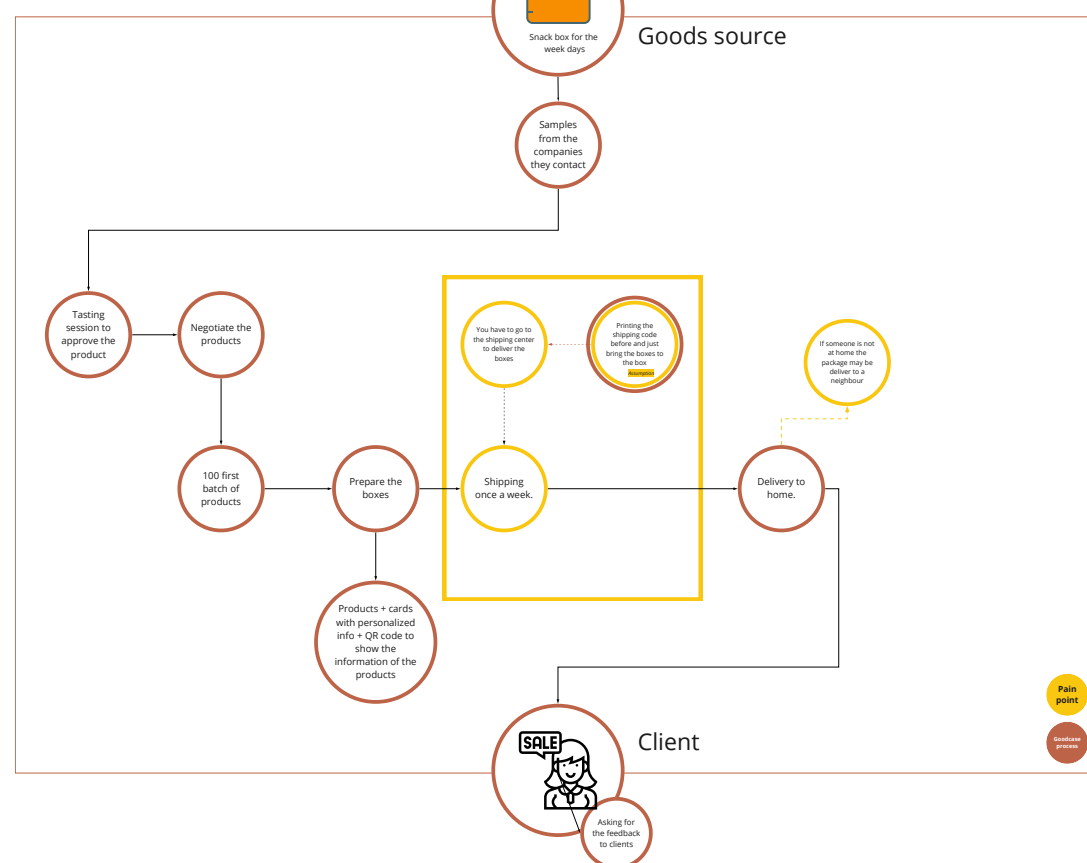
Content:	So we have a QR code on the on the cards. I think should be because our like the content Part of the stories of the products and this stuff is online. Okay. So we have videos, we have a video for each product that explains the concept of the product and why it's sustainable. We have a blog post that, that tells the story of the products in text form. Okay. On our website. Yeah. And that's, that's not physically included in the box, but it's online.
☰ 2:11 what we're doing now is that we're only shipping once a week. Because we don't. We don't want to spe...	
Coding:	<ul style="list-style-type: none"> ◦ Constrains in shipping process
Content:	what we're doing now is that we're only shipping once a week. Because we don't. We don't want to spend too much time on it's going to the post office every day.
☰ 2:12 And this means that this one guy, my co founder, who has other boxes at his place, he has to go to t...	
Coding:	<ul style="list-style-type: none"> ◦ Entrepreneur packaging painpoint
Content:	And this means that this one guy, my co founder, who has other boxes at his place, he has to go to the post office and dispatch the products or the boxes.
☰ 2:13 we have to do something else in the personnel shop. That would be annoying. So I hope that we can pr...	
Coding:	<ul style="list-style-type: none"> ◦ Constrains in shipping process ◦ Doubts in shipping process ◦ Entrepreneur packaging painpoint
Content:	we have to do something else in the personnel shop. That would be annoying. So I hope that we can print the address and also the shipping shipping code or what it is and then just bring it to a shop.
☰ 2:14 And this is this is also why we use the letter boxes. So this shouldn't be a problem. And also get s...	
Coding:	<ul style="list-style-type: none"> ◦ Constrains in shipping process ◦ Packaging convenience
Content:	And this is this is also why we use the letter boxes. So this shouldn't be a problem. And also get silly with this.

Stakeholders overview

A visual representation of the general information about the stakeholders: this overview was created with the data from interviews and desk research. A diagram of the assumption of the internal process around packaging, logistics and waste was also added.



LOGISTICS MODEL



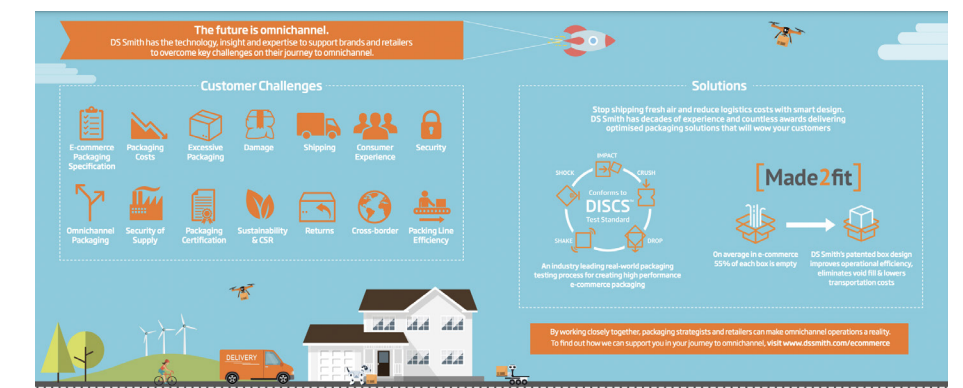
PACKAGING DESIGN PERSPECTIVE



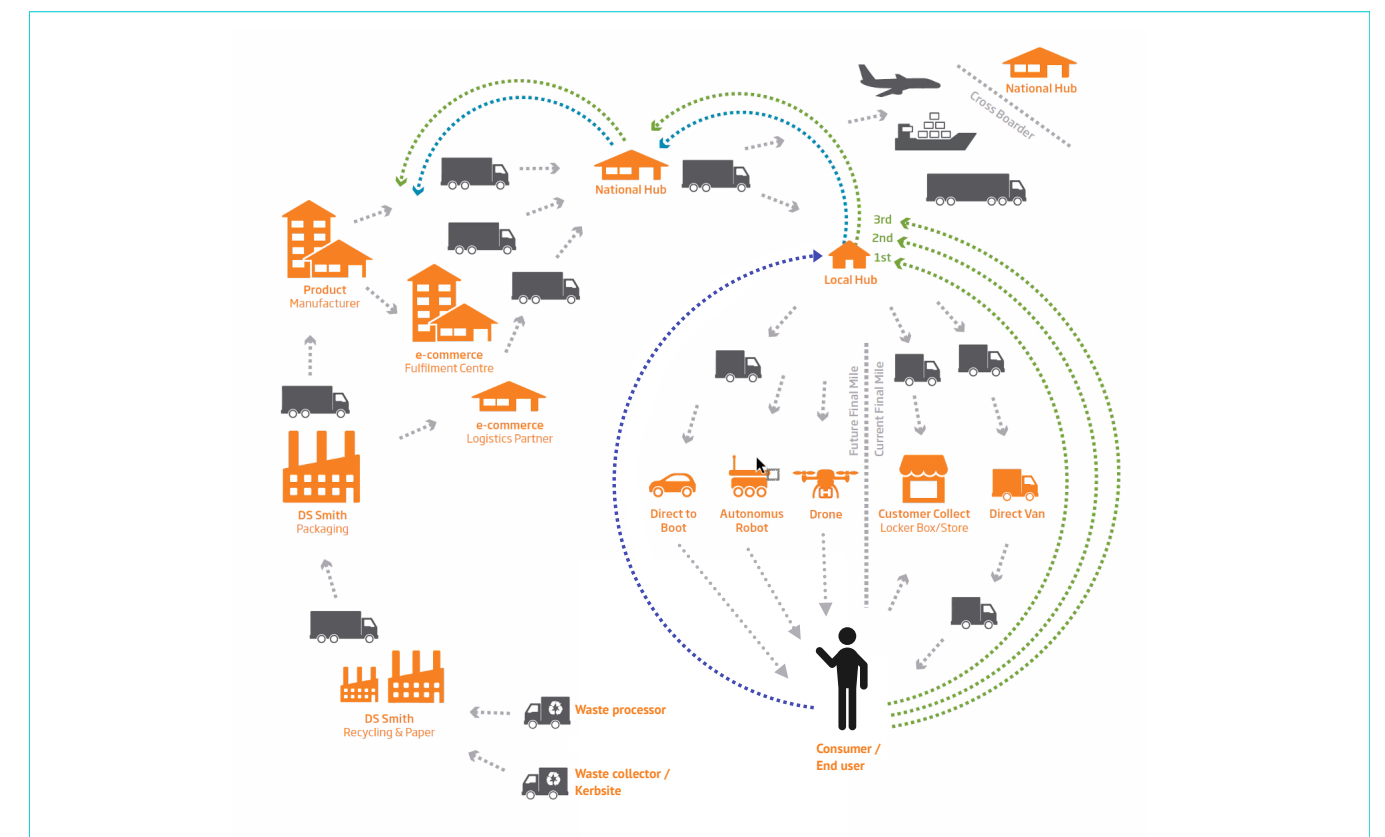
"Ds Smith launched around three to four years ago, a webshop, called dsms e pack. And this, the idea of this was to take some of our good designs, our hero designs, and they are then produced in a higher volume. And they are stored in a warehouse. And then we sell in, I think anything like 510s 20s and things like that. So what it does is it allows customers access to more customized designs, and ones that would have cost a lot more in development or design knowledge, etc. and been in the supply chain, and also non standard."

They can they don't have to pay for origination plays, no tooling costs or anything like that. And they can just buy the boxes that they need.

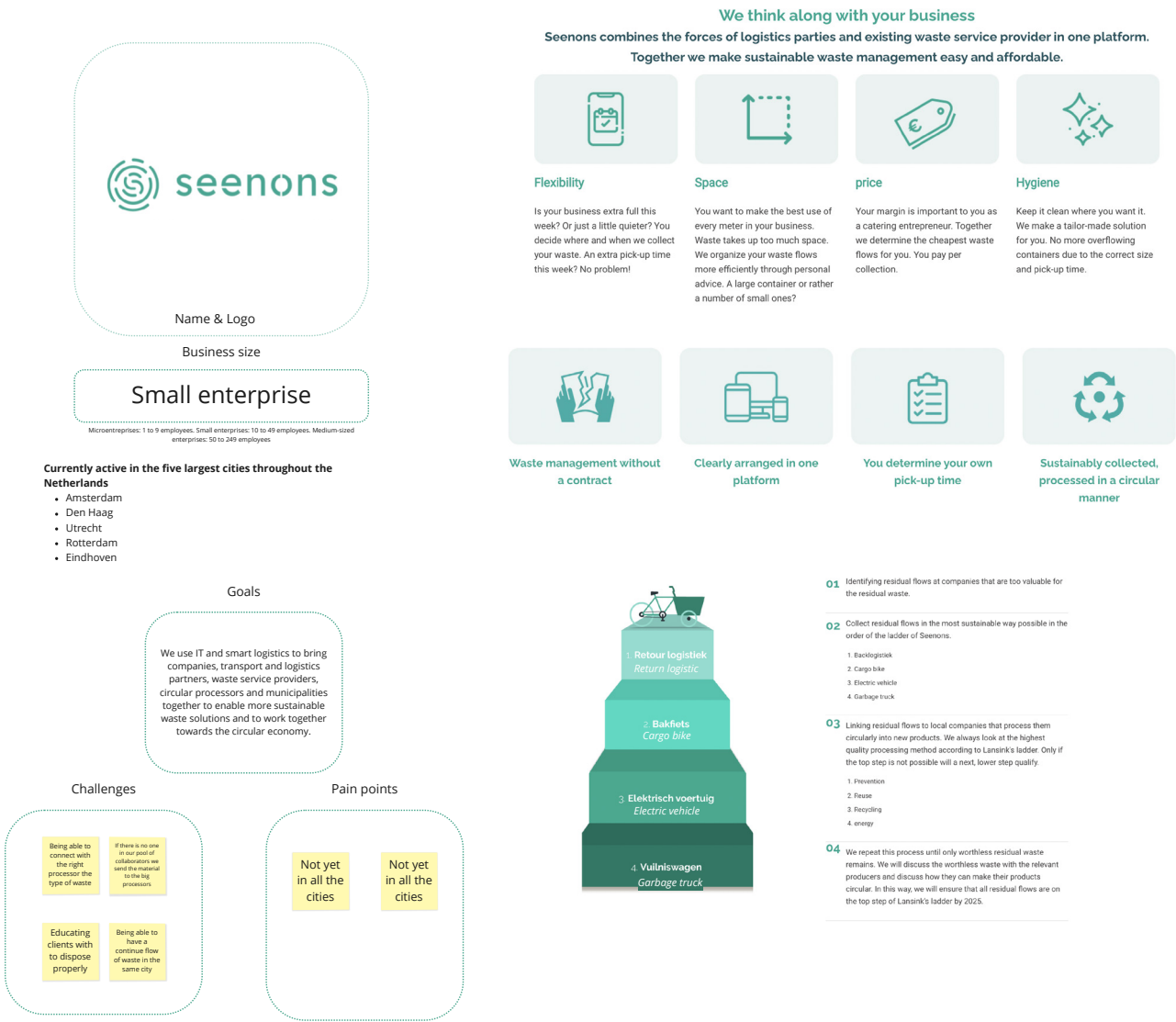
"I know for big companies and different teams and demands, it can take anything up to 12 months to launch a new cardboard packaging"



E-COMMERCE LOGISTICS MODEL

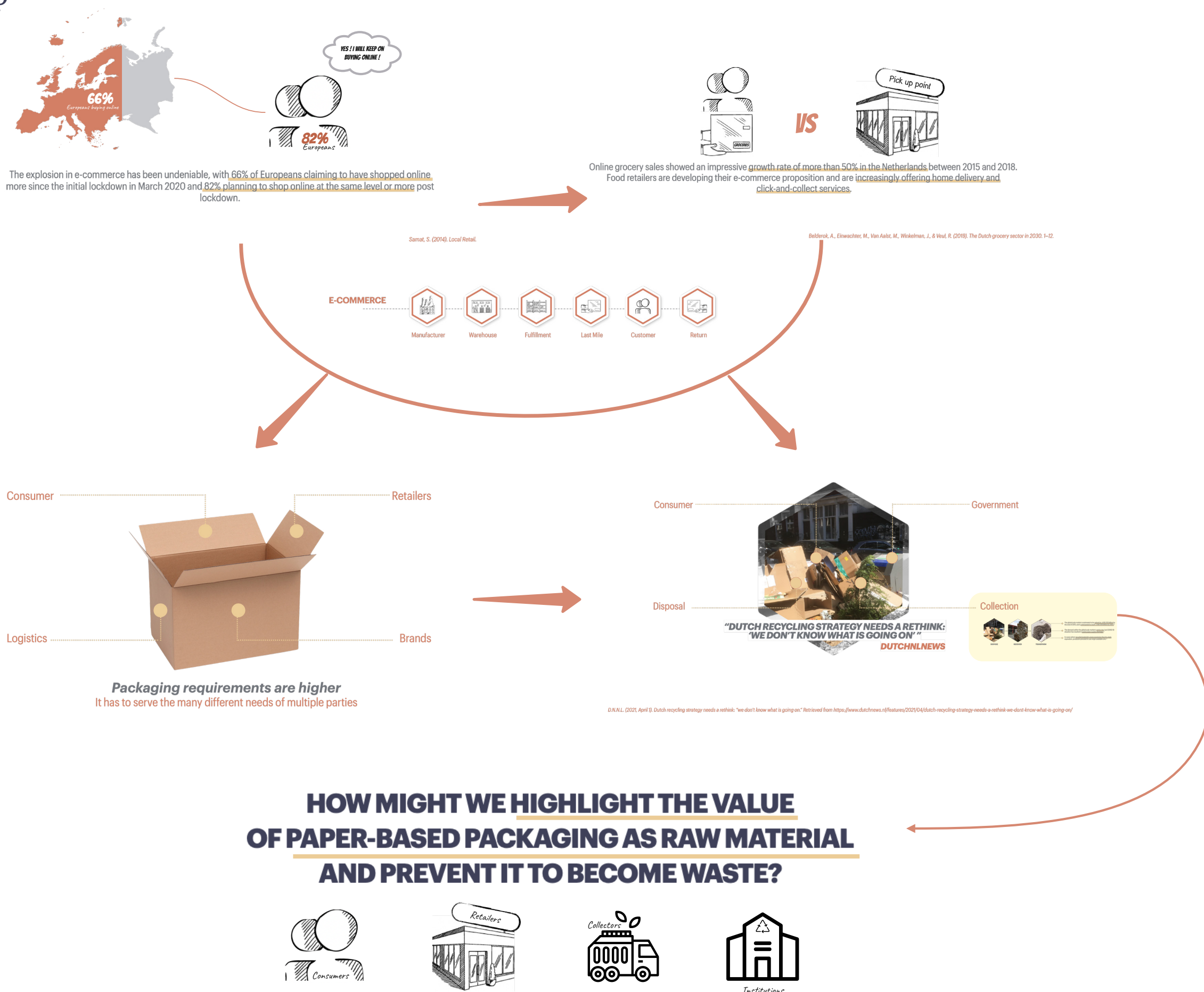


WASTE COLLECTION AND SORTING



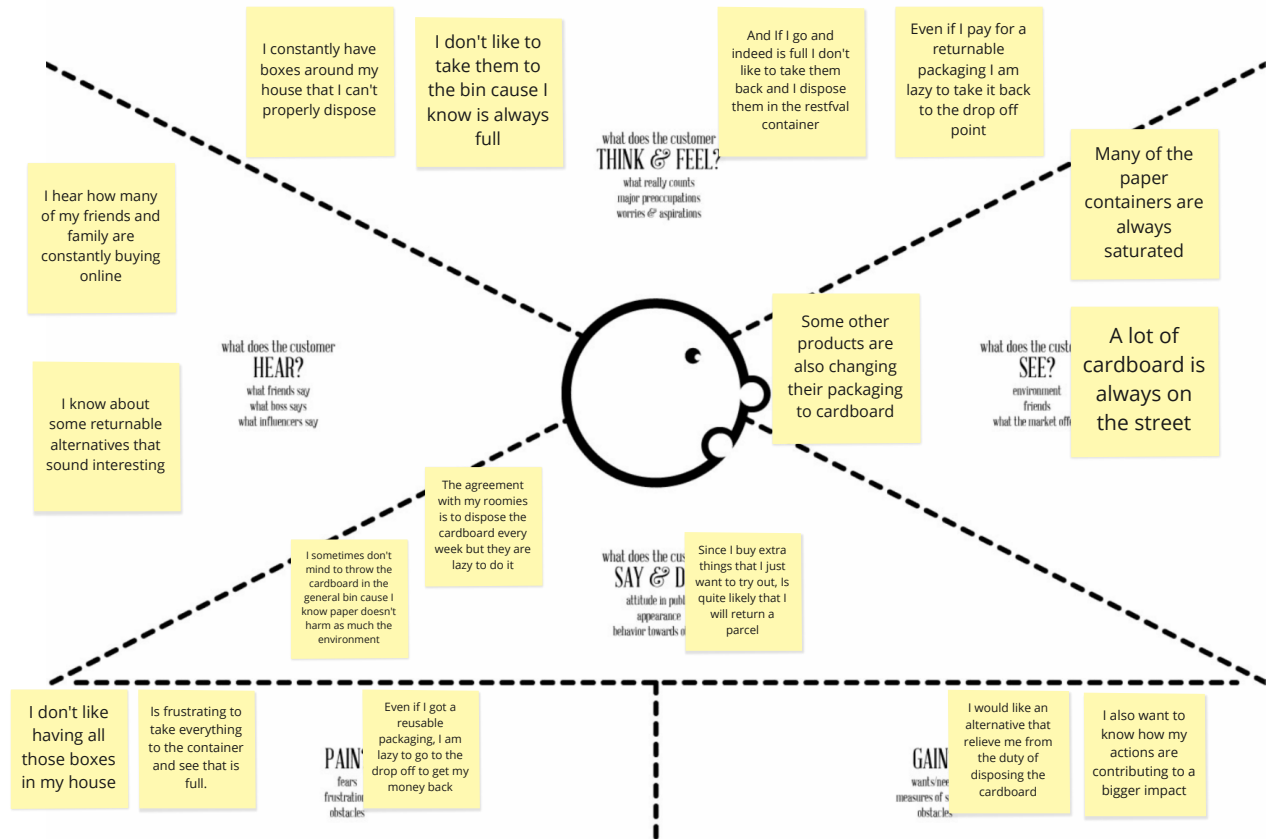
E Ideation session set up

This ideation took place online while using tools such as Zoom and Miro. A general context of the problem was explained with the presented visuals. The participants were able to follow the presentation thanks to the Miro features.

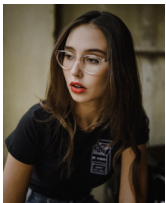


Consumer empathy maps & personas.

Consumer personas



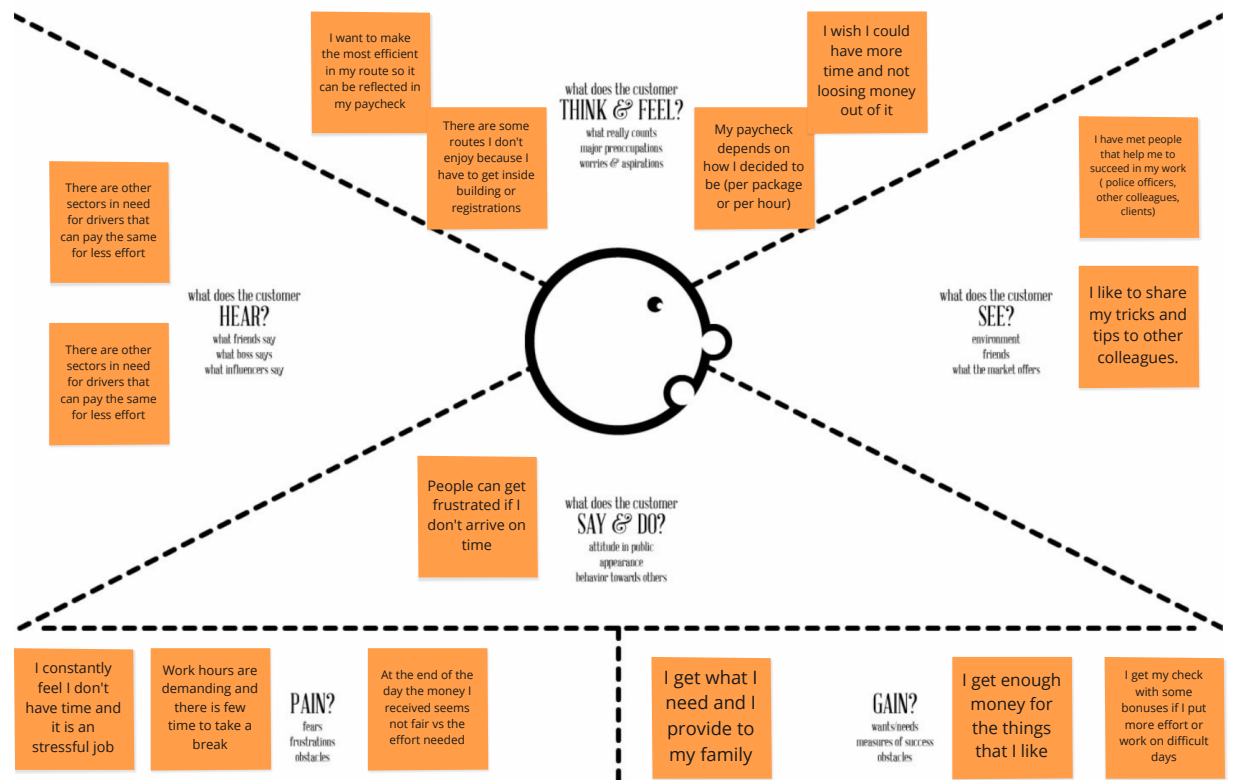
PERSONA CARD The resurmer shopper

NAME Use a realistic name for your persona. Tara		PICTURE Draw a picture, cut from a magazine or print from a webpage and paste here. 	
DESCRIPTION What type of persona is this? Constantly active person. She likes to have flexibility in her schedule and the way she shops. Very active on social media and well known for her online shopping behavior.			
QUOTE Provide thoughts or words from the persona that capture the essence of who they are. "I adopted in my way of living everything that is easy, convenient and doesn't harm the environment"			
WHO IS IT? Describe the personal profile, age, location, job title, and other characteristics of the persona. A late 20's master student that has found in online shopping an ideal alternative to buy new items. Someone who cares about the environment, but she reflected it in other aspects of her life (plant-based diet).			
MOTIVATIONS What motivates the persona? What are their (latent) needs and desires? What is their point of view? She is constantly chasing discounts & also looking for the most convenient options.		GOALS What is the persona trying to accomplish? She is a person that likes change and that is reflected in her shopping habits. She will buy an item and try it in different colors and sizes. Then she will return the items she doesn't like	
BEHAVIORS What do they do? Tell stories about their behavior as it relates to their role. Describe how they communicate. What messages do they respond to? What are big frustrations? She likes to order several pieces and then return what she doesn't like. She is constantly expecting a package and she knows for sure she will return something, therefore a route to the drop off point is part of their life.			


PERSONA CARD The conscious disposer

NAME Use a realistic name for your persona. George		PICTURE Draw a picture, cut from a magazine or print from a webpage and paste here. 	
DESCRIPTION What type of persona is this? He is quite flexible with his time and the experiences he wants to enjoy. His job allows him to manage his own schedule. Is a person that enjoys the nature.			
QUOTE Provide thoughts or words from the persona that capture the essence of who they are. "I like new experiences that involved my community. I appreciate all the local products that I can find around my place"			
WHO IS IT? Describe the personal profile, age, location, job title, and other characteristics of the persona. An early 30's gentleman living with his partner. His passion is cooking and walking around small villages. He loves to read and he has already a big collection of books of different topics. Is very passionate about languages and other cultures.			
MOTIVATIONS What motivates the persona? What are their (latent) needs and desires? What is their point of view? Locality inspires him and is always looking for activities that allowed him to explore more about the place he is currently in.		GOALS What is the persona trying to accomplish? The sense of exploration has made him to like products that express a story or an impact.	
BEHAVIORS What do they do? Tell stories about their behavior as it relates to their role. Describe how they communicate. What messages do they respond to? What are big frustrations? Since one of his passions is reading, he often buys books online. He preserved the package and wait until he has enough material to be disposed, since the bin is not close by his current place of living. He also likes to research more about different alternatives to take care of the environment			


Driver personas



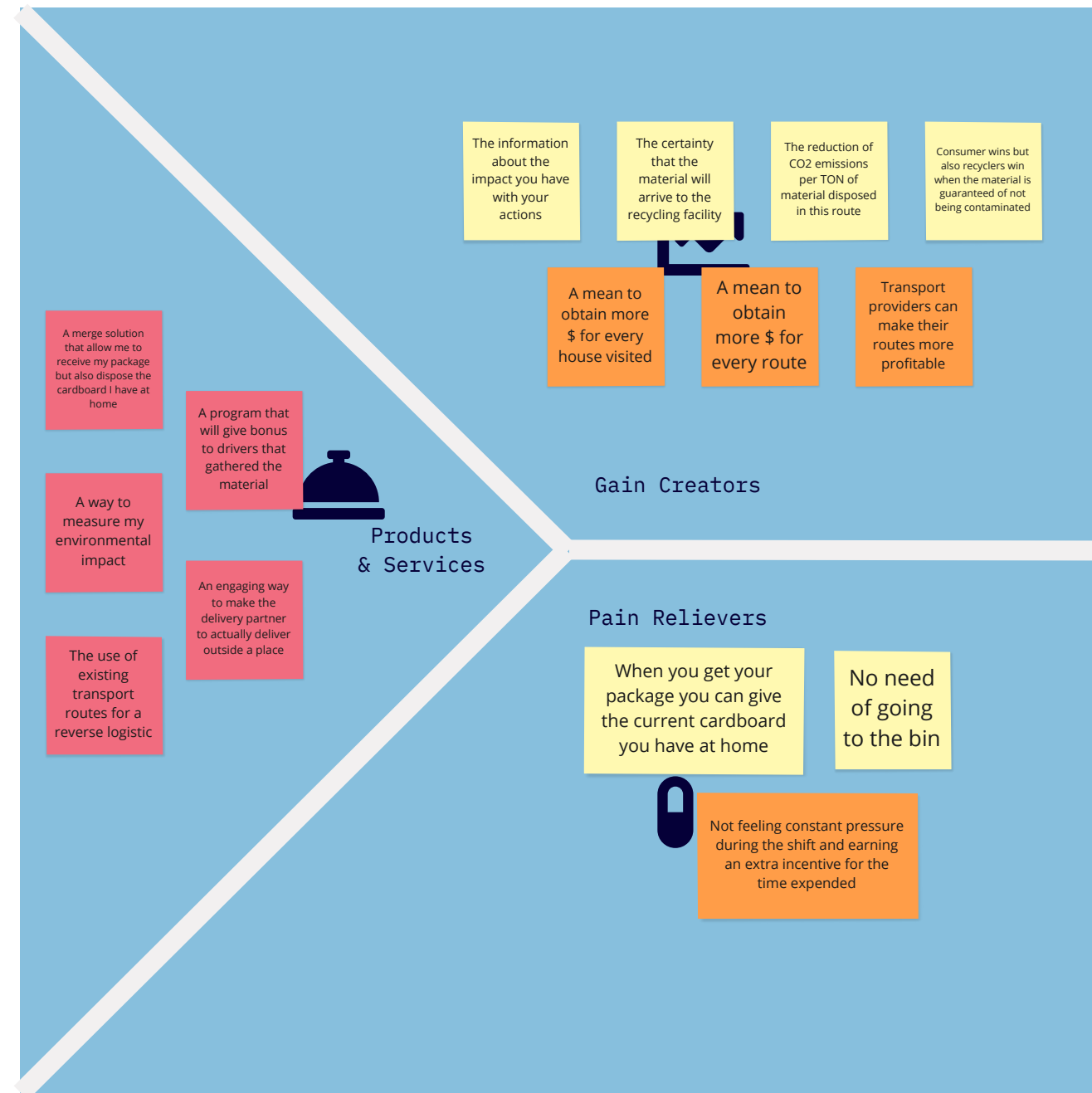
PERSONA CARD The experienced driver

NAME Use a realistic name for your persona. Willem		PICTURE Draw a picture, cut from a magazine or print from a webpage and paste here. 	
DESCRIPTION What type of persona is this? A very experienced man that has been driving for more than 30 years. He has plenty of experience with logistics. He has been in different businesses; from delivering flowers, parcels up to delivering packaged food (hello fresh kind of concept). He even drove a taxi for quite some time that has put him inside Amsterdam but also outside it.			
QUOTE Provide thoughts or words from the persona that capture the essence of who they are. "The navigation will never be compared to my experience & tricks I know around the city"			
WHO IS IT? Describe the personal profile, age, location, job title, and other characteristics of the persona. 53 years, 100% Amsterdamer. 5 children 1 dog. Not married but in a long relationship. Smoking quite a lot. Very fan of the Ajax and has been living in Amsterdam all his life.			
MOTIVATIONS What motivates the persona? What are their (latent) needs and desires? What is their point of view? He is someone that has been changing from sector because he gets tired about the same routes and experiences during his working life.		GOALS What is the persona trying to accomplish? Right now he is pursuing a promotion as a supervisor so he can help other drivers to optimize their routes too and share his knowledge.	
BEHAVIORS What do they do? Tell stories about their behavior as it relates to their role. Describe how they communicate. What messages do they respond to? What are big frustrations? For him is very important to optimize their routes, therefore once he got the information from his supervisor, he review it to make the route according to what he knows. He doesn't need navigation because he says that an app will never tell him the tricks he already know about the city. When is the moment to pick up material, he already knows where do they kept it and where to place the empty buckets.			

PERSONA CARD The novice driver

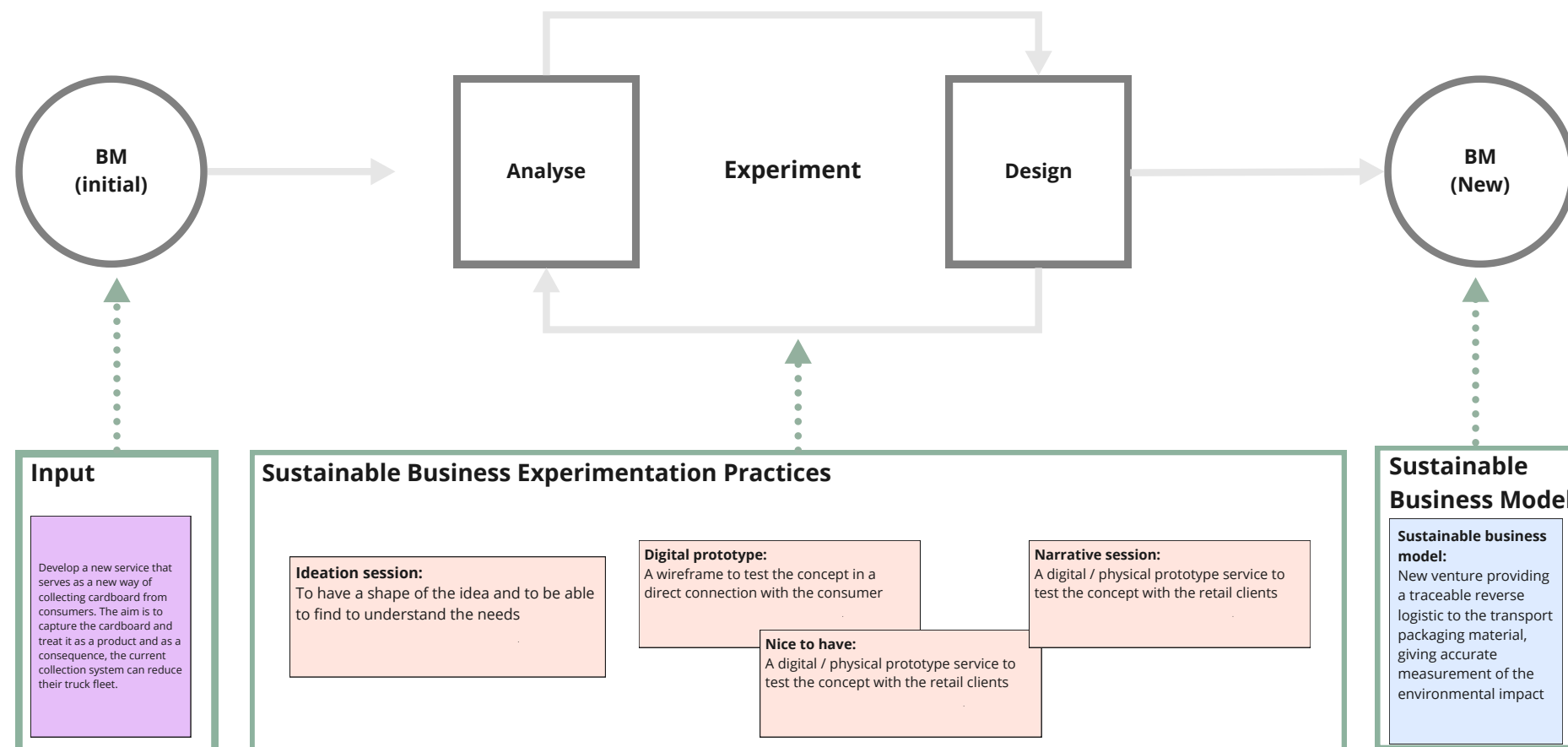
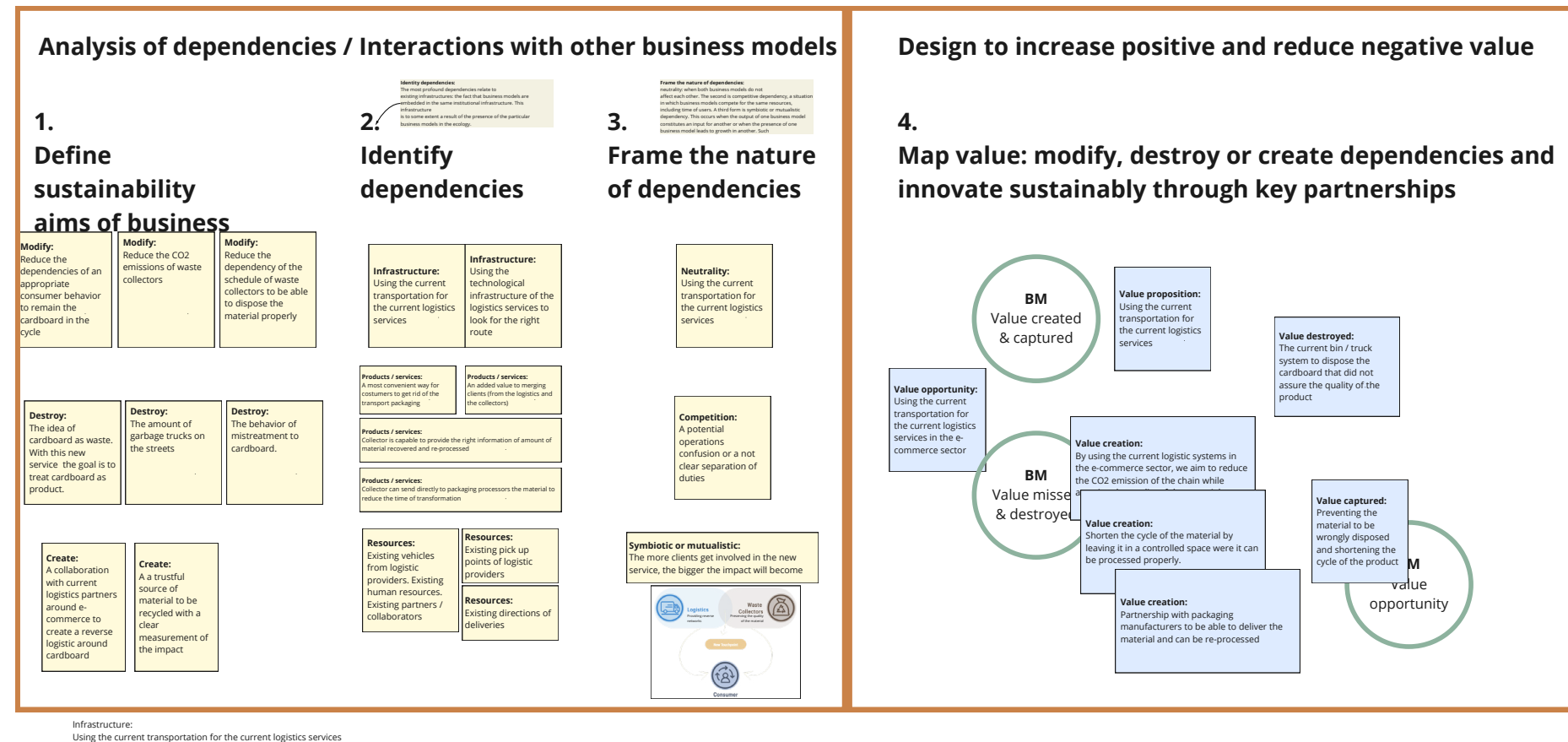
NAME Use a realistic name for your persona. Steve		PICTURE Draw a picture, cut from a magazine or print from a webpage and paste here. 	
DESCRIPTION What type of persona is this? A novice driver taking some time off from his studies to become a delivery driver. This work provides him with enough money to be covered for a month. He is still living with his parents. Technology is quite easy for him to handle, since he has been in contact with any type of device and app. Being a driver will be his first official job.			
QUOTE Provide thoughts or words from the persona that capture the essence of who they are. "I work for a logistic contractor, and in good months I averaged \$1200 per week!"			
WHO IS IT? Describe the personal profile, age, location, job title, and other characteristics of the persona. 21 years, From Indonesian parents, but living in the Netherlands all his life. With a big fascination for video games and technology, and he likes to analyze and find the best hacks to achieve more. Single and enjoying life with his friends.			
MOTIVATIONS What motivates the persona? What are their (latent) needs and desires? What is their point of view? Since technology really passionates him, he likes to create youtube videos about his experiences with different video games to share his tricks and tips.		GOALS What is the persona trying to accomplish? He is someone that is exploring and he wants to enjoy his youth. He is right now comfortable being in the position where he is	
BEHAVIORS What do they do? Tell stories about their behavior as it relates to their role. Describe how they communicate. What messages do they respond to? What are big frustrations? The idea that technology can provide him with income is very attractive to him. He is a good contributor to other drivers to take advantage of the tools and apps. "Put the system on your side" is his goal and he is constantly trying new things. He tries to push his adult responsibilities as much as he can, therefore he has no idea about taxes, retributions or any complicated compensations.			

G Value proposition canvas



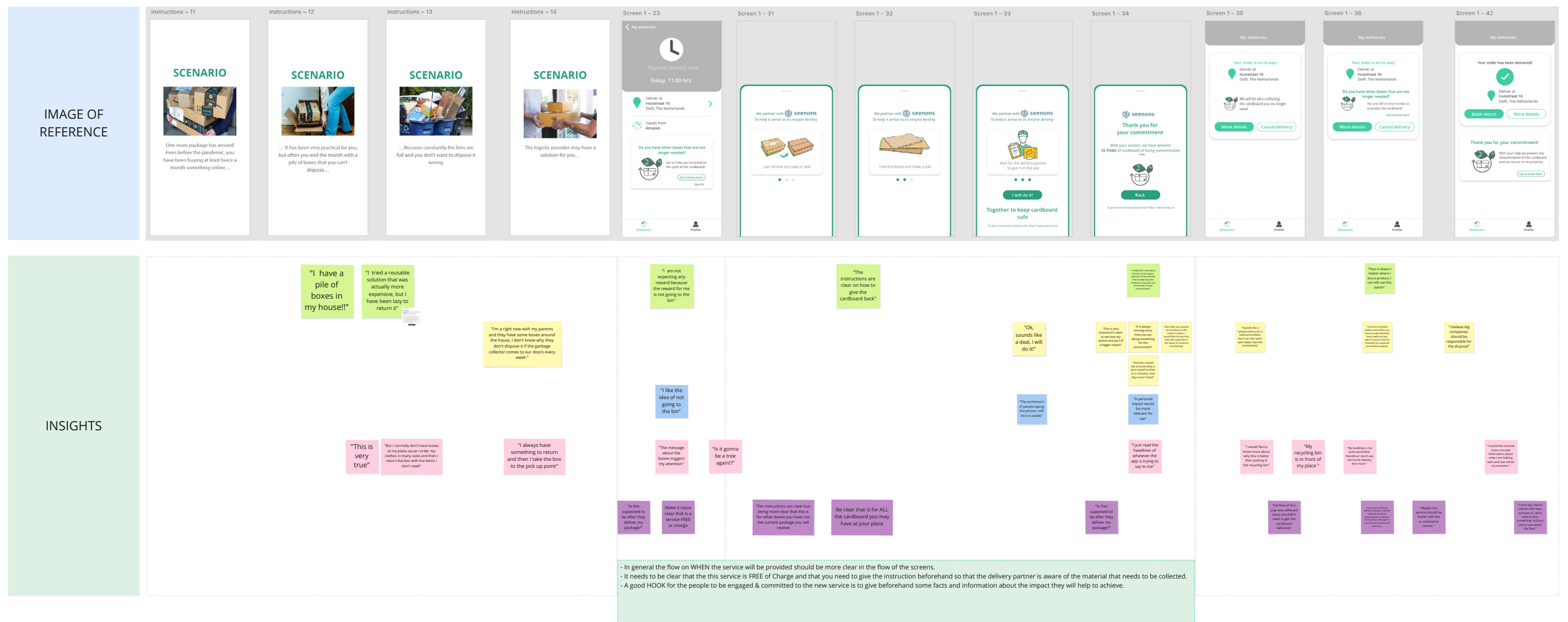
H The ecology of business model experimentation map

A detailed version of the framework used during the experimentation phase.



I Feedback user flow

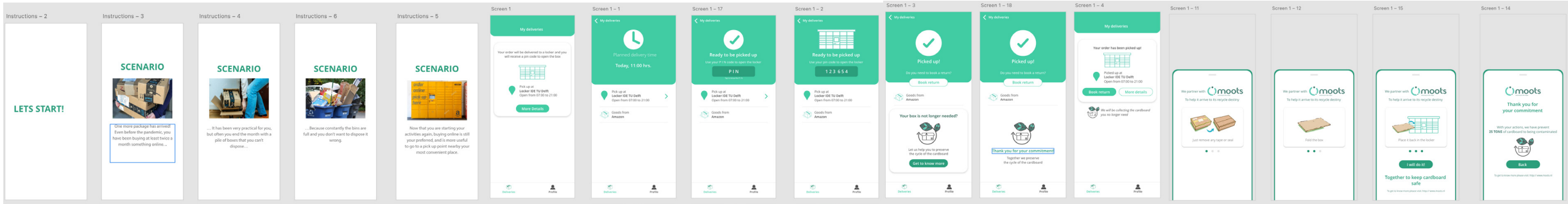
As a visual person, I needed to gather all the insights from the first experiments into a visual flow that allowed me to understand the user's thoughts according to every step of the journey mapping. This table is based on good practices from UX design that I learned during my thesis at 510 Red Cross.

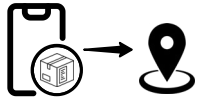

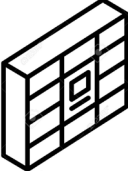
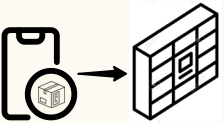
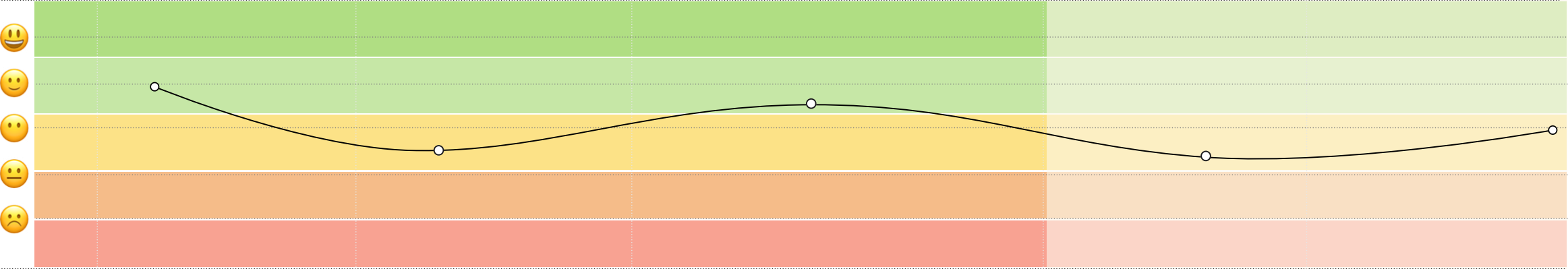


Journey mapping experiments

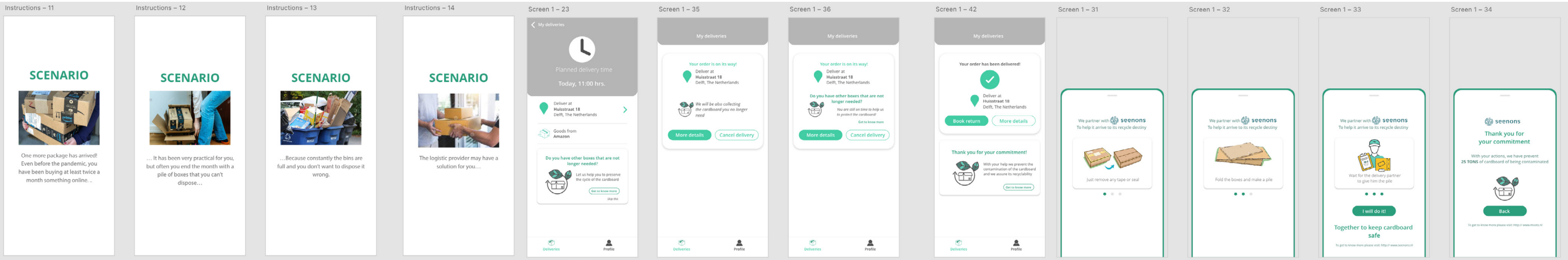
First attempt

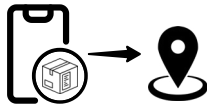
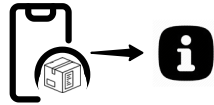











Based on a delivery in a pick up point






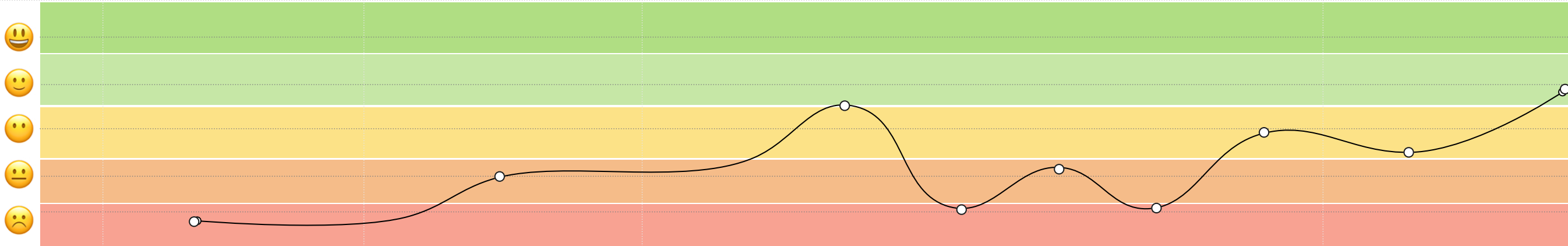
Stage	Awareness	Consideration	Decision & Delivery		Exchange	Re-incurrence
Customer activities	Customer received the information about the arrival of the parcel & notice a new option to left the transport packaging	Checking the instructions and reviewing the considerations to be able to leave the transport packaging	Decides to review the purchased item and under the assumption of a no need of return, customer decided to leave the package	If there is a need of return the item, the consumer will take all the package		Once customer understand better the locker idea, it may find it more attractive
Customer goals	Having a new way to get rid of the packaging and reduce waste, without too much effort	Feeling intrigued about the main package and curious about the alternative of leaving the transport packaging	A period of hesitation may occur when you are reviewing the package			
Touchpoints	 Logistics partner App w/ tracking information	 Logistics partner App w/ instructions on how to dispose to leave the material and the benefits in the value chain	 Lockers		 Delivery service app & Lockers	
Experience						
Feeling	Curious about the intention of leaving the package. "At least I will not take garbage to my house"	"If I just have to fold and leave there sounds convenient"	"If my product is ok and I don't have to return anything I will leave the box there. I don't want another box in my house"			

Second attempt
Based on a delivery at home



Stage	Awareness		Consideration	Decision		Exchange	Re-incurrence & Reflection
Customer activities	Customer received the information about the arrival of the parcel & notice a new option to dispose the transport packaging		Checking the instructions and reviewing the considerations to be able to leave the transport packaging	Preparing the cardboard you want to dispose		Giving the cardboard to the delivery partner after I received my package	Sharing experience and getting to know more about the impact
Customer goals	Having a new way to get rid of the packaging and reduce waste, without too much effort		Feeling intrigued about the product bought and curious about the alternative of leaving the cardboard	Accepting giving the cardboard to the delivery partner.		Getting rid of the cardboard in an easy & responsible way	Curiosity to learn more about the impact of their action.
Touchpoints	 Delivery partner App w/ tracking information		 Delivery partner App w/ instructions on how to dispose to leave the material and the benefits in the value chain	 Delivery partner APP		 Delivery partner	 Word of mouth
Experience	    						
Feeling	User recognized the situation and express a relief about the option "Sound like a nice alternative to get rid of the pile of boxes I have in my house"		"If I just have to fold the cardboard, put it in a pile and have it ready until the delivery partner arrive, sounds convenient"	"If my product is ok and I don't have to return anything I will leave the box there. I don't want another box in my house"		"I received my package and then I wanted to also give the box I received but I can't"	"I definitely will tell my friends about this alternative of disposal" "I like to know how my impact help to recycle the material"

Third attempt
Based on the journey of a delivery partner

	ROUTE PREPARATION		DELIVERY			ROUTE CLOSURE
Stage	Arrival	Preparing	Check in & Deliver			Returning & Check out
Collector activities	<ul style="list-style-type: none">Check- in with supervisorReview the "order of the day" to analyze the location of the clients and review the route with the app	Going to another Hub to collect more packages	<ul style="list-style-type: none">Parking the van close by the destinationArriving to destination and deliver the packages <p>(some places already established an instruction to the drivers on where do they have to deliver, also when they deliver packages to pick up points, they already know where to place all the packages)</p>			<ul style="list-style-type: none">Going back to HUB to left the transport there (Van)Check out the end of the turn.
Collector goals	Finishing the route on time Optimize their time to deliver as fast as possible		Deliver the packages			Deliver the orders, the scanner and the van
Touchpoints	 Drivers App & Warehouse paper orders		 Drivers app & orders, Parcel racks, Delivery lockers, Door by door			 Driver app & orders, Van
Experience						
Feeling	Driver gets frustrated about the use of the paper and the app. "The app never works, I cannot scroll to see the next direction, I don't have an overview of the places I have to go, that's why I always review it on paper"	Driver starts to analyze their routes and placing all the packages according to the address so he can make his time more efficient "If I take a moment right now to check the orders and place it according the route, It will be easy for me to deliver"	Driver enjoys going around the city doing his job "I know all the tricks around, even if a street is close, I know the immediate next solution"	Driver also receives other complains about other deliveries "What do they want me to do? Is not my fault"	Deliver finds annoying to access to high buildings "If there is many deliveries in the same building is ok but if I just have one it makes me feel like I am wasting my time"	"That's it I am going home."

