MASTER THESIS

DESIGN FOR PHILIPS GROOMING PRODUCT RETURN EXPERIENCE

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MSC INTEGRATED PRODUCT DESIGN

PHILIPS

TU Delft

Design for Philips Grooming Product Return Experience

Master Thesis

March, 2022

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Preface

When seeing this assignment, I suddenly recalled the old electronics that piled up in my drawer for years. After being aware of the environmental value that might be wasted by storing old devices, this topic sparked my strong interest and ambition in changing grooming users' behaviour to make a significant impact and at least change myself at the end of the project.

Before I started, behaviour change and service design were relatively new to me. This project has become one of the hardest that I have ever done, making me often doubt my abilities as a designer. However, I am blessed to have an amazing group of people who supported me when I got lost, encouraged me when I was down, and shared my happiness when I achieved every single step. I believe these people and this experience are the treasures this project has brought to me, which will become one of the most unforgettable parts of my life.

I would like to thank my supervisors, Conny and Ruth. Your "harsh" comments always pushed me to think further, which essentially helped me strengthen my critical thinking. Thanks for your thoughtfulness and patience in explaining everything explicitly until I fully understood, although I was sometimes not being communicative. Thank you for being tolerant of my bad English writing and your warm encouragement after seeing my improvements in both writing and research, which makes me extremely happy and much more confident. I am so grateful to have you as my supervisors for this most important project in my master's.

Thanks to Helle, who has been the mentor from Philips. Thank you for giving me this opportunity to explore sustainable service design. Your valuable feedback, positive energy, creative thinking, and passion for sustainability have always motivated me to explore more possibilities. You are such a considerate person who always encouraged me and cared for my feelings, helping me get out of my comfort zone with sufficient support. I cannot express more gratitude for your guidance as my mentor and your care as a sister. Like you said, "It's always good to have a sister in another country". I am so lucky to have a sister like you!

Thank you, Elena, and the Philips sustainability design team, for sharing all the knowledge and resources, giving me opportunities to share my work and connect with other brilliant people. Thanks to the "intern squad" girls, who made the last few months of my project not feeling alone and more memorable.

Thanks to Teresa, Josse, Thanyawan, Manjari, and all the people from Philips who supported me during the project. Thanks for your engagement and practical feedback that facilitated my project, which allowed me to get essential information to reach the desired design goal.

A heartful thanks to all my friends staying with me during these months. Jinnan, Maria, Parshva, Rong, Shuyan, Xiaonan, Zixi and all the friends who provided me with warm physical and mental support. Thanks for sharing your brain, sharing my happiness and pain.

Thanks to all the research participants, for sharing the experiences, thoughts, and valuable feedback, which allows me to get in-depth research insights and complete my final design.

Moreover, none of my work would be possible without the love and support from my family and my boyfriend, who provides me with endless support and company whenever I need them.

Finally, I want to thank myself for being brave to face all the challenges, get out of my comfort zone, and never stop improving.

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23 March, 2022

Executive summary

With the rapid rise in consumption and production, natural resources are becoming increasingly scarce. As the prevalence of the linear economy leads to neglect in the product end-of-use (EOU) phase, moving towards a circular economy (CE) can maximize the product value by recovering and reusing. As one of the circular strategies applied by some industries, the take-back program could enable a company to take back used products from consumers and reintroduce them to the production cycle, thereby facilitating the CE. However, if consumers rarely bring back EOU products, manufacturers can hardly close the loop (Ellen MacArthur Foundation, 2013).

This thesis project collaborates with Philips, aiming to motivate Philips Grooming consumers to return used products to Philips so that devices can be recycled or refurbish. However, consumers rarely return the device. Therefore, this project intends to explore how an effective take-back program can be developed to change Grooming consumers' behaviour towards returning.

Fogg behaviour model is the key methodology supporting the project research. It was used for exploring the relationship between users' behaviour and the influencing factors, thereby providing valuable insights for the design direction. Taking Fogg behaviour model as a starting point, service safari, benchmarking, and in-depth user interviews were conducted to understand the service context and target group behaviour. The data obtained from these activities were further analysed, synthesised, and formulated to executive design directions.

This project ends up with a final service concept, "Philips Grooming Take-back", which applies various design interventions and service strategies to create a painless and seamless divestment experience for users by meeting different values that each individual needs. The concept could also create long-term value for Philips, other stakeholders, and the environment. In addition to the service concept, this project has addressed systematic design opportunities and requirements for behaviour change in the Grooming divestment context, which could be potentially leveraged for other relevant initiatives of Philips Personal Health.

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INTRODUCTION

This chapter introduces the project by first articulating the broader context, which is the essentiality of the transition from a linear economy to a circular economy. Then, under the large context, Philips's initiative is introduced to describe the more focused project background. This is followed by elaborating the research gap, the project scope, and research questions. Finally, the project approach is presented to illustrate different design phases.

1.1 PROJECT BACKGROUND

The broader context

1.1.1 Moving towards a circular eonomy

With the rapid rise in consumption and production, natural resources are becoming increasingly scarce. One of the reasons for this is the prevalence of the linear economy, which is a one-way process of "take-make-use-dispose" (Ellen MacArthur Foundation, 2013). The linear economy leads to neglect in the product end-of-use (EOU) phase. In this phase, EOU products were simply discarded despite the possibility of recovering and reusing. This exacerbates pollution and resource shortages.

In order to tackle the resulting environmental issues, the concept of circular economy (CE) has been introduced. CE aims to radically limit the extraction of raw materials and the production of waste by recovering and reusing as many of the products and materials as possible systematically (Ellen MacArthur Foundation, 2013).

By moving towards CE, industries can maximise the value and use of resources whilst minimising waste. Currently, an increasing number of companies are putting CE into practice.

One strategy that is widely applied is the take-back program. Some take-back programs enable companies to take back old products from consumers and reintroduce them to the production cycle. However, if consumers rarely bring back EOU products, manufacturers can hardly close the loop (Ellen MacArthur Foundation, 2013). Therefore, the successful implementation of CE requires not only the action from companies but also the involvement of consumers. For implementing a take-back program, it's challenging yet significant to change consumers' behaviour from not returning to returning.

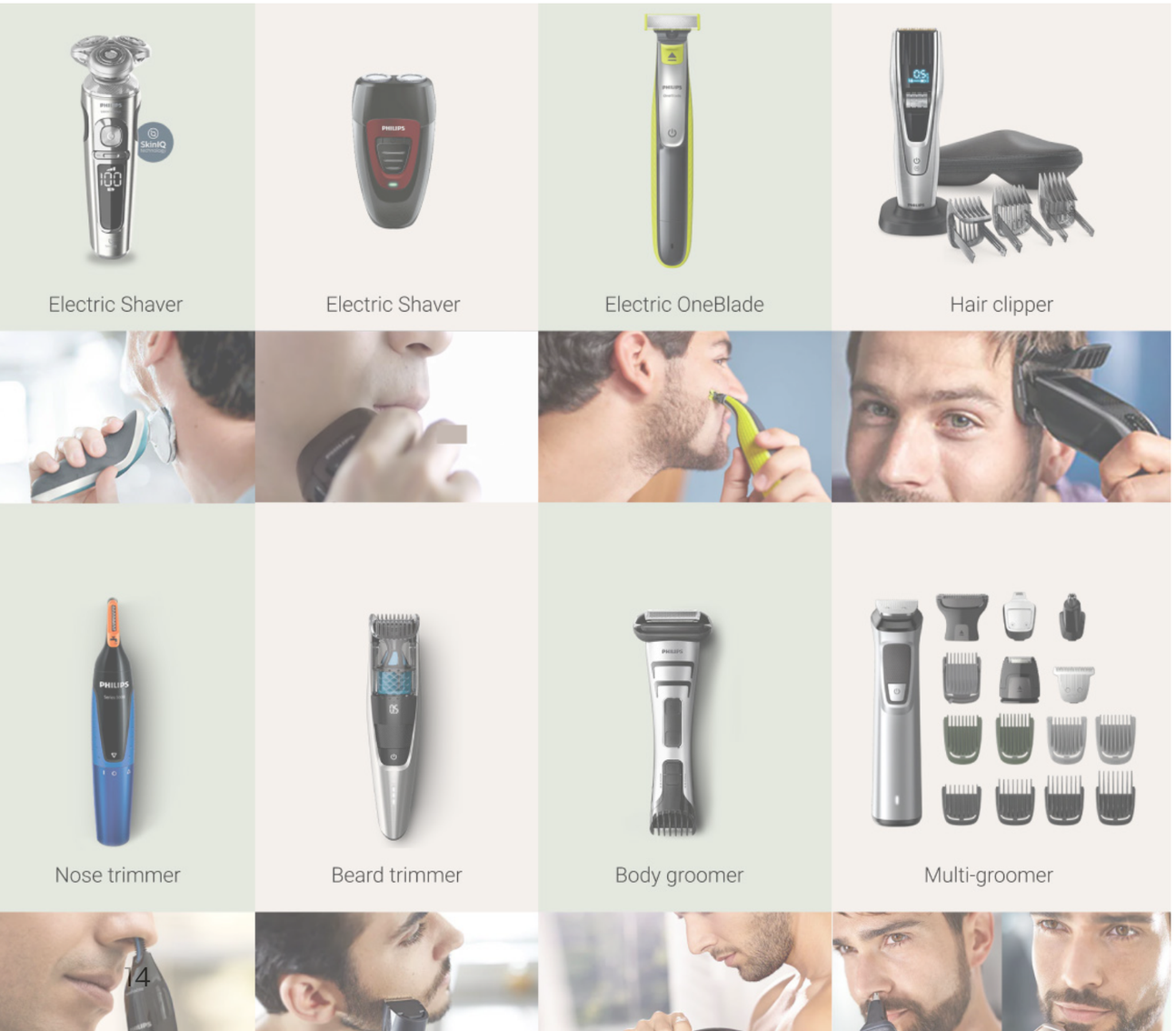
"The economy of the future might be called the "spaceman economy," in which the earth has become a single spaceship, without unlimited reservoirs of anything."

Kenneth E. Boulding

The project focus

1.1.2 Philips Grooming products

This thesis project collaborates with Philips Personal Health and focuses on the take-back program of Philips Grooming products. Philips aims to close the loop by collecting old Grooming products from consumers and bringing the device to recycling or refurbishing. However, consumers rarely return their products, although Philips is running a free-recycle service (Phillips, n.d.). Therefore, Philips intends to establish how an effective take-back program and pleasant EOU experience can be created for Grooming consumers.



1.1.3 The research gap

To maximally involve consumers in the take-back program, It's crucial to understand the user's EOU experience and behaviour. Some studies have explored factors influencing the mobile phone return process and developed various service solutions to improve user engagement (Mertens, 2018; Polat, 2018; Ren, 2018). Poppelaars (2020) has developed design principles for the smartphone EOU experience by synthesising the insights from relevant design projects.

While these studies are valuable for the Grooming return service design and development, considerable differences exist between the smartphone context and the Grooming context due to the variance in target users, devices, and services. Furthermore, since few studies have looked at the EOU behaviour in the specific Grooming context, the design opportunity exists in understanding Grooming consumers' current behaviour and designing an effective service to trigger the return behaviour and, as a result, facilitate the process of closing the loop.

1.1.4 Project scope

Design an effective and lasting Grooming take-back program to motivate consumers to return devices that are no longer used.

Research questions

1. What is the current context of the Grooming return program?
    - What is the broad context of the problem regarding sustainability?
    - What is the current scenario regarding Grooming device return?

2. Why are Grooming consumers not returning the used devices?
    - What theories can help with investigating their behaviour?
    - What are the current behaviours?
    - What are the key factors that influence their behaviour?
    - How do the key factors influence their behaviour?

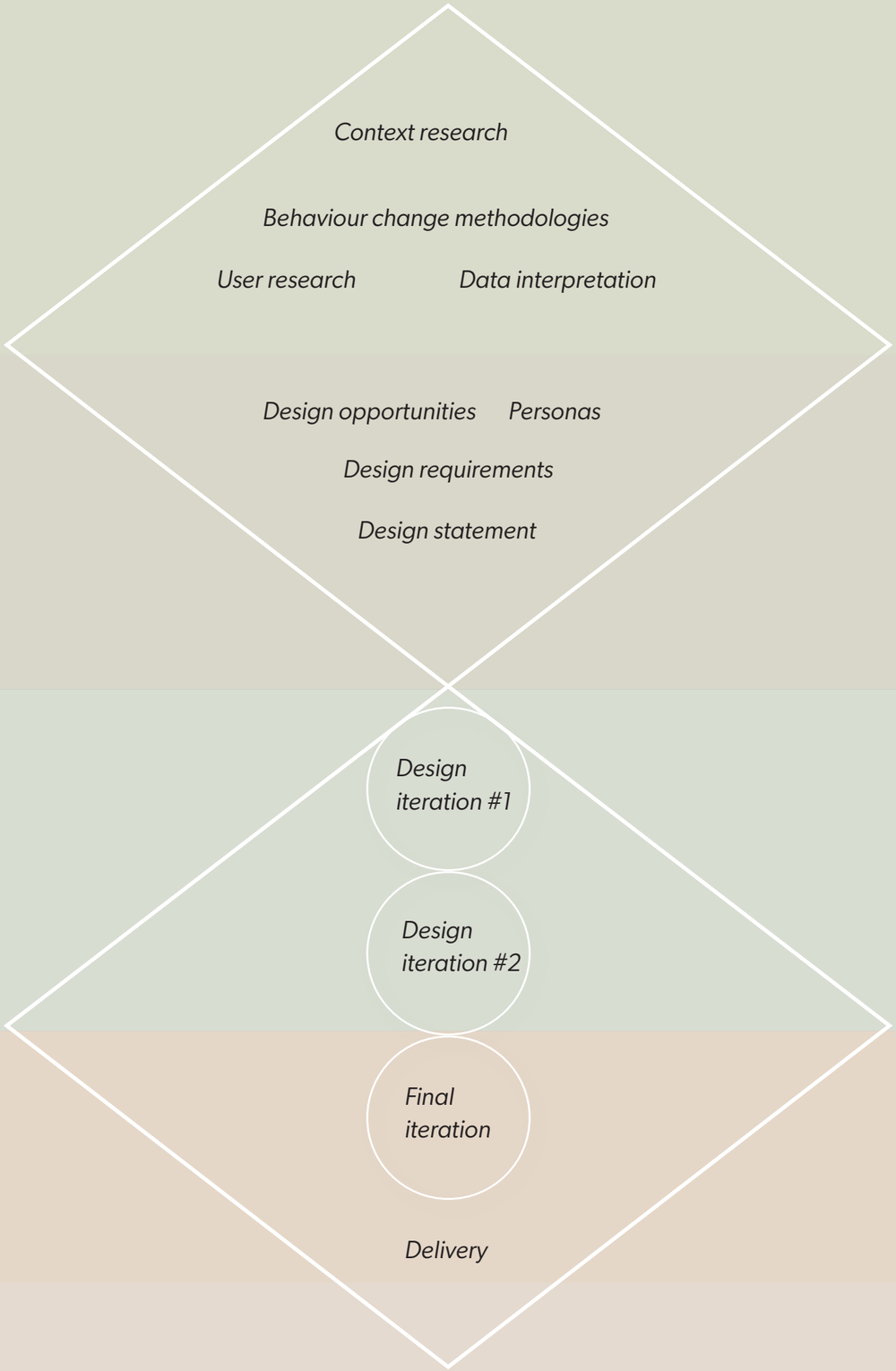
3. How to change consumer behaviour towards returning?
    - What interventions can be used for behaviour change?
    - How will the design solutions vary based on different phases in the user journey?

1.2 PROJECT APPROACH

The basic flow of this project is to first deeply understand consumer behaviour and then generate design solutions, which is a typical divergence-convergence design flow. Therefore, this research has used the Double Diamond design framework (British Design Council, 2015) as a basis for design approach and report structure. The double diamond framework can serve as a suitable guideline throughout the divergence-convergence process.

Because this project does not use a linear design process, the model has been slightly adjusted to fit this specific assignment better. In addition, unlike the traditional linear model, the variant had three small iterations added in the Develop phase to show the iterative procedure explicitly.

Based on this framework, this project approach can be presented in five stages.



Discover

The Discover phase aims to dive into the problem and context. It starts with understanding the sustainability development direction, the Grooming device dilemma, and the reasons for designing for take-back programs. Then it explains the key findings from the literature study that explores the behaviour change methodologies, followed by the design approach for applying the methodologies for this project. Finally, this chapter presents the research process and findings from data analysis, which provide essential arguments for the Define phase.

Define

The Define phase was aimed to synthesise the information from the Discover phase and define the new design goal. By analysing the data from user research, I formulated the key insights and personas, which shaped the design opportunities and design requirements for the diverging process.

Develop

The Develop phase was aimed to think up service solutions for a satisfying return program. Several rounds of ideation and evaluation sessions were conducted with the supervisory team and professionals. From the preliminary concept to the intermediary concept, two iterations formulated the improvement directions for the final design.

Deliver

The Deliver phase was aimed to present the final improved design. In this phase, a detailed solution in the form of a product-service combination was presented in a service blueprint, a service flow, and a system map to describe the service in different layers systematically. Afterwards, several touchpoint designs are explained in detail.

Evaluation

Followed by the Deliver phase, the Evaluation phase assessed the final design from different angles. It first started with a business case analysis. Afterwards, a service roadmap was formulated to present the implementation in different horizons. Finally, a reflection was conducted on the final roadmap to discuss the potential risks and desirability.

02
DISCOVER

The Discover phase aims to dive into the problem and context. It starts with understanding the sustainability development direction, the Grooming device dilemma, and the reasons for designing for take-back programs. Then it explains the key findings from the literature study that explores the behaviour change methodologies, followed by the design approach for applying the methodologies for this project. Finally, this chapter presents the research process and findings from data analysis, which provide essential arguments for the Define phase.

2.1 Context research

1 A transition from a linear economy to a circular economy
2 The EOU issue of Philips Grooming products
3 What is a take-back program?

2.2 Design for behaviour change

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2 Behaviour change methodologies: Fogg's behaviour model
3 Design approach

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1 User research questions and research activities
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3 Benchmarking on business strategies
4 In-depth interviews

2.1 CONTEXT RESEARCH

Research questions explored in this section

- *What is the current context of the Grooming return program?*
- *What is the broad context of the problem regarding sustainability?*
- *What is the current scenario regarding Grooming device return?*

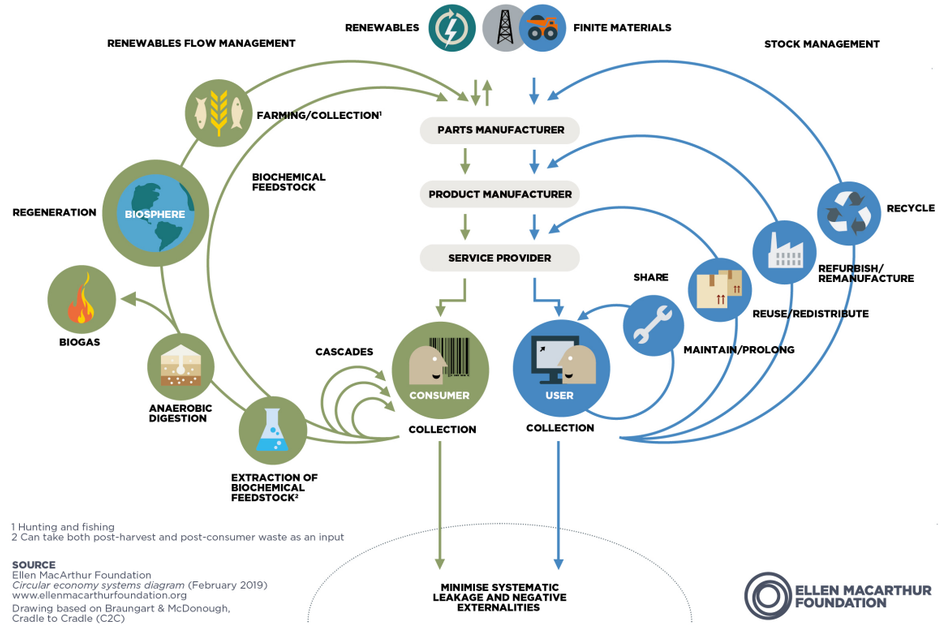


Fig. 2.1 Circular economy system diagram

The broader context

2.1.1 A transition from linear economy to circular economy

With the advent of the Industrial Revolution, products began to be produced on a much larger scale. This gradually shaped the linear economy, which is a one-way process of 'take-make-use-dispose' (Ellen MacArthur Foundation, 2013), that is, human beings take the resources from nature, make the products to be sold and make a profit and dispose of used products. When these products are discarded, space for processing the waste is taken up from natural areas, and toxic substances are often also emitted (PBL, 2018). The linear economy model has led to the environment facing increasingly high pressure.

What is the Circular Economy

Some environment-conscious economists argue that the conventional linear economy needs to be gradually supplanted by the CE model (Greyson |, 2020). Unlike the linear process, CE is a "make/remake - use/reuse" economy (Ellen MacArthur Foundation, 2018). It can minimize resource input and waste and balance the dilemma between industrial development and environmental issues. In this way, it is a win-win situation for society and the planet.

The design challenge

2.1.2 The EOU issue of Philips Grooming products

According to Figure 2.1(Ellen MacArthur Foundation, 2018), there are several ways to close the loop for EOU devices: Reuse/ redistribute, refurbish/remanufacture and recycle. However, the current electronic waste collection rate for those circular repurposing is relatively low. Electronic products in the world are often thrown away prematurely, and less than 20% are collected and recycled (PACE, 2021). Philips Grooming products are also facing this typical linear scenario: the electrical Grooming devices are usually simply discarded or stored at home when consumers are facing EOU, although all the devices can be recycled, and some of them can be redistributed or refurbished. As a big healthcare company, Philips is conscious of its responsibility towards society and the evironment. They are aiming to develop more circular practices and put zero waste to landfills by 2025 (Appendix B). Therefore, Philips aims to initiate a take-back program to increase the collection rate and close the loop.

2.1.3 What is a take-back program?

A take-back program is a service organised by a manufacturer or retailer to collect used products or materials from consumers and reintroduce them to the original processing and manufacturing cycle (Circular Economy Practitioner Guide, n.d.). In this project's scenario, Philips's take-back program intends to encourage consumers to send back their unwanted Grooming devices. So that Philips will recycle or refurbish the devices based on their condition.

The project focus

EOU could be mainly caused by two scenarios.

Scenario 1
The user wants to extend the product use cycle but fails to do it

Some users may still want to keep the product in the current use cycle but passively fail to do it due to extrinsic causes. For instance, a user wants to keep using a broken product by self-repairing it but eventually stops the use cycle after an unsuccessful self-repair attempt.

Scenario 2
The user wants to end the product use cycle

Some users may want to end the product use cycle due to intrinsic causes. For example, a user wants to upgrade the shaver to the newest one.

According to Poppelaars et al.(2020), users in the second scenario would face a divestment. Divestment is a process that combines physical, mental and emotional separation when users end the product use cycle. In order to narrow down the project scope, this project mainly **targets the users who are facing the divestment (scenario 2)** for the further design development phase.

2.2 DESIGN FOR BEHAVIOUR CHANGE

Research questions explored in this section

- *Why are Grooming consumers not returning the used devices?*
- *What methodologies can help with investigating their behaviour?*
- *What are the key factors that influence their behaviour?*

2.2.1 Why start from behaviour change?

Behaviours of individuals and households have major and cumulative impacts on the ecology and sustainable development (Verplanken, 2018). The effects could be direct, such as the automobile emissions, or indirect, such as returning old products for refurbishing and recycling, which is the focus of this project. While big industries and governments significantly influence the development of sustainability goals, knowledge about individuals' behaviours is important for progressing sustainable development (Verplanken, 2018). Therefore, behaviour change methodologies are suitable for solving the problem in this project context.

2.2.2 Fogg's behaviour model

As stated in the research aim, we want people to change toward returning Grooming devices. To achieve this, we need to get a picture of making the desired behaviour happen. Fogg (2009) has proposed a behaviour model consisting of three major factors: motivation, ability, and prompts (Figure 2.2). The desired behaviour will happen only when the person is motivated, capable of performing it, and triggered simultaneously. Furthermore, the activation threshold means the prompts only work when the motivation and ability are high enough. In other words, users with high ability but low motivation need to raise the motivation to cross the behaviour activation threshold and vice versa.

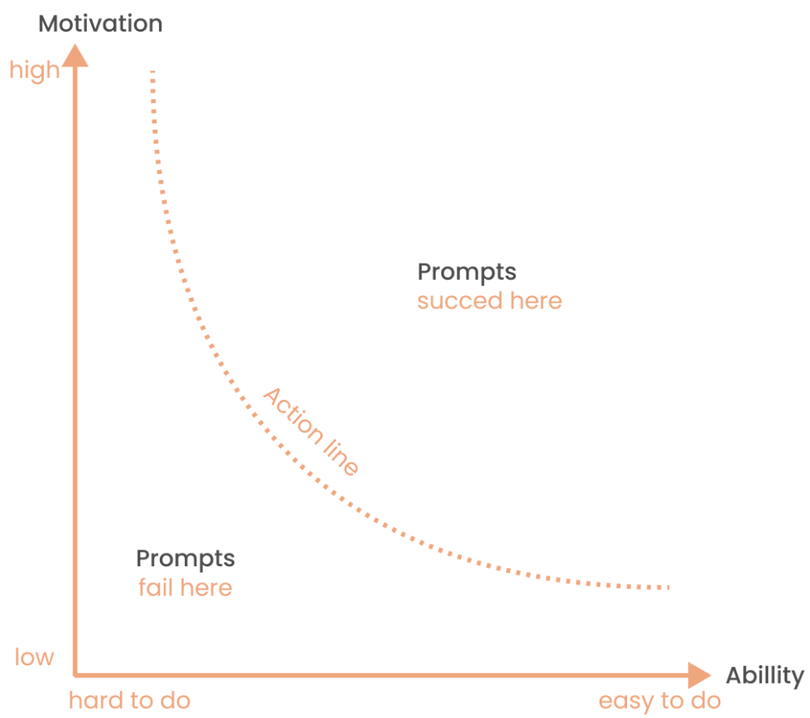


Fig.2.2 Fogg Behaviour model

Why Fogg's behaviour model?

Fogg's model served as a good starting point for shaping the research approach. It could help me to develop a more comprehensive set of research questions and allow me to cover more sub-factors in a structured way. Therefore, this model was taken as the major theory to support the research.

The three elements and assumptions of sub-factors

According to Fogg, motivation, ability, and prompts are the main three factors that decide one's behaviour. While Fogg has suggested several sub-factors that affect the three key elements such as emotion, time, money, etc., I decided to not only look at Fogg's insights but also find out more project-relevant and specific sub-factors. Therefore, I developed a summary of sub-factors based on Fogg's three-element structure. This summary combines my own assumptions and relevant perspectives from other studies. Figure 2.3 illustrates a relation between the three major elements and the subfactors.

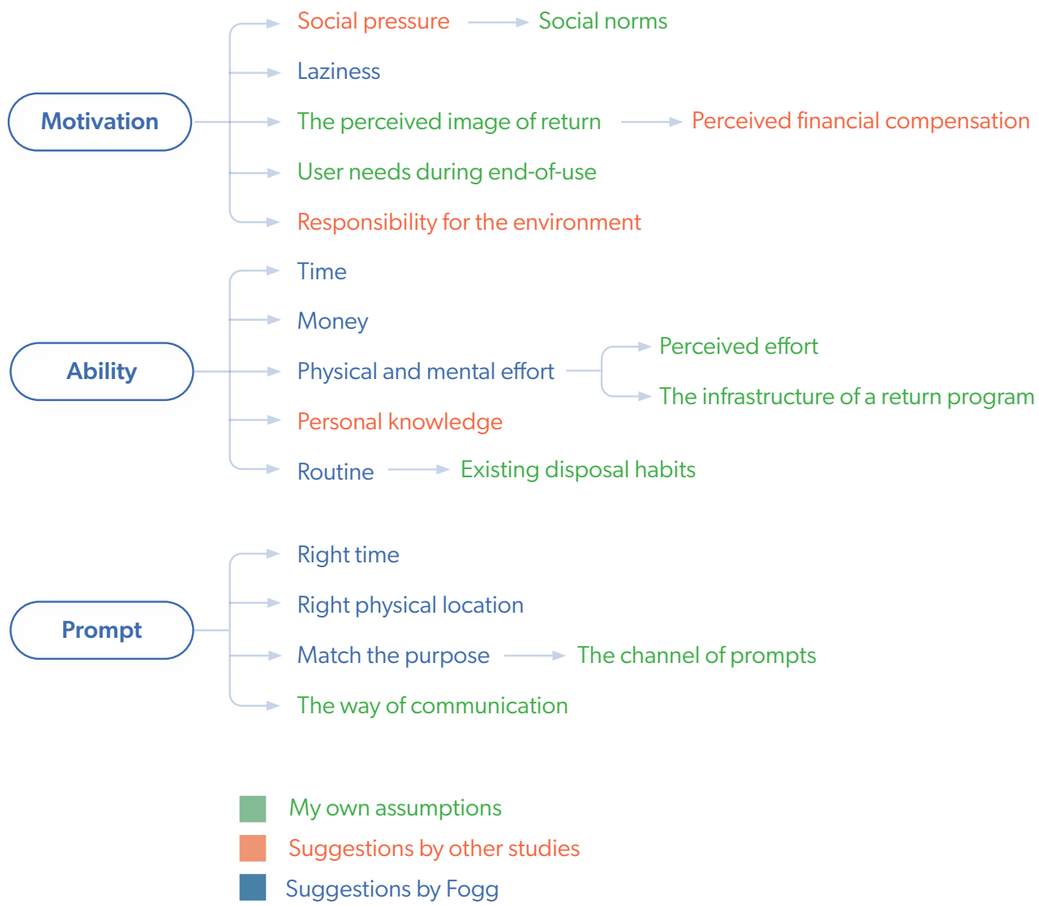


Fig.2.3 Three elements and assumptions of sub-factors

Motivation

An effective return program needs consumers to be highly motivated to return. In other words, the return program should create a desire for the consumers to participate. Some factors may influence one's motivation to return Grooming devices.

Laziness

Laziness could cause existing habits, but it also acts as a single factor for the return behaviour. As human beings, we are fundamentally lazy. A lazy user's motivation is hard to increase, especially when the service is not easy to use.

Social pressure

Social influence can broadly impact behaviour (White et al., 2019). For example, social pressure can lead to high motivation for a behaviour conducted by most others. This pressure usually comes from social norms that are shared standards of acceptable behaviour by groups (Lapinski & Rimal, 2005). For instance, a Grooming user's social pressure may come from a context that returning is a common and 'standard' thing in society. So in this context, not returning is disapproved by most people, leading to high motivation to return.

The perceived image of return

A good perceived image can increase a consumer's motivation to return. The perceived image is formed by a user's personal knowledge about return programs, previous return experience, and the information communicated by the return program. It can be further influenced by the perceived effort, perceived (financial) value, and the company's communication.

User needs

Whether a return program could meet the user needs largely affects the user's motivation to participate. Therefore, it's important to know what are the EOU needs and how to meet the needs to motivate people to return. Therefore, several specific needs are brought out based on my assumptions.

Responsibility for the environment

Having a high degree of responsibility for the environment can largely motivate people to return when they are aware of the environmental value of the program.

Ability

To increase the ability, the designers must make the target behaviour able to do and easy to do. The following factors can determine the ability for the return behaviour.

Personal knowledge

Limited personal knowledge and cognition could be a barrier for performing a target behaviour (Gifford, 2011; Verplanken, 2018). The awareness of the return program even acts as a prerequisite for the behaviour. For instance, a return will never happen if the user doesn't know the existence of the return program.

The infrastructure of a return program

Barriers in the service process, such as low accessibility and usability, may lead to low ability to return and prevent the user from returning. This factor could be further divided into sub-factors as the accessibility of return service and the usability of return service.

Money

People with limited financial resources may have a lower ability to conduct the target behaviour when it costs money. This may also lead to a decrease of motivation.

Existing disposal habits

Routine or habits are primarily caused by unconscious decisions, which can hardly be influenced by an individual's intention or willpower (Verplanken, 2018). Therefore, a person's previous disposal habits may lead to high motivation for that specific behaviour. For instance, it will be difficult for a person to return an old Grooming device if he used to store every electronic device at home.

Prompt

A prompt can trigger a target behaviour by notifying, reminding, and sometimes motivating the person to conduct that. Examples are alarm sounding, email reminder, etc. Unlike motivation and ability, prompts cannot be merely measured by high or low. However, the target behaviour can depend on the prompts' effectiveness. In this project, the influential factor of prompts can be determined as below.

The channels of prompts

A proper channel can help the prompts reach out to the target user effectively. For instance, prompts can be sent via different media platforms based on different age groups' media habits.

2.2.3 Design approach

1. User mapping and data interpretation

As shown in Figure 2.4, the first step is to understand users, which is conducted in the Discover phase. This step aims to explore the current degree of users' motivation and ability to return Grooming devices and the degree of effectiveness of existing prompts.
The result of this step would be a user mapping on a two-dimension diagram determined by motivation and ability. As prompt effectiveness is difficult to be visualised on this diagram, the insights of prompts were documented separately. Moreover, how each factor influences the user behaviour would be deeply analysed during the research activities.

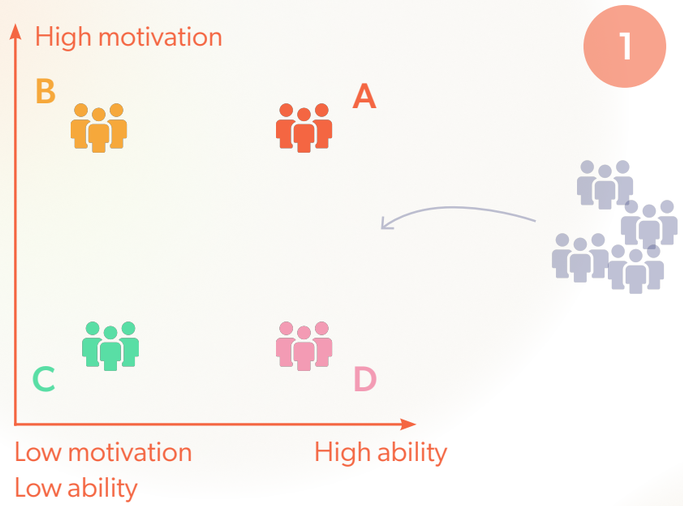


Fig. 2.4 User mapping and data interpretation

2.Define the design opportunities

As shown in Figure 2.5, the second step was conducted in the Define phase. After the user mapping and analysis of influential factors, the design opportunities could be defined.
According to Fogg's model, the prompts work best when motivation and ability are both high, which means people located in segment A are most likely to be triggered and have their behavior changed. Therefore, the design opportunities would focus on *"How the factors could be intervened to bring people from segment B, C, D to segment A".*

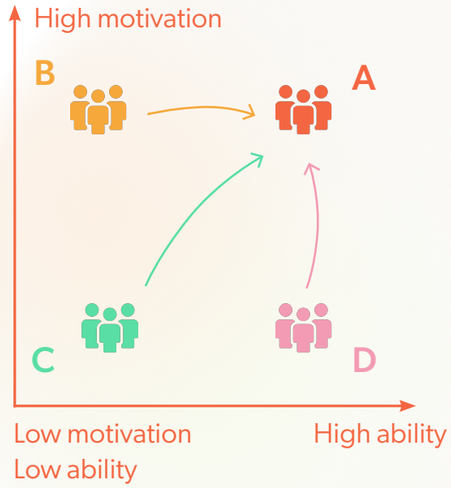


Fig. 2.5 How the factors could be intervened to bring people from segment B, C, D to segment A".

3. Ideation and conceptualisation

As shown in Figure 2.6, after determining the opportunities, it's time to start thinking about the solutions. This step aims to ideate on "What interventions could be applied to bring people to segment A and trigger them simultaneously?". As a result, ideas were sorted and integrated based on the user journey and finally formed a service concept.

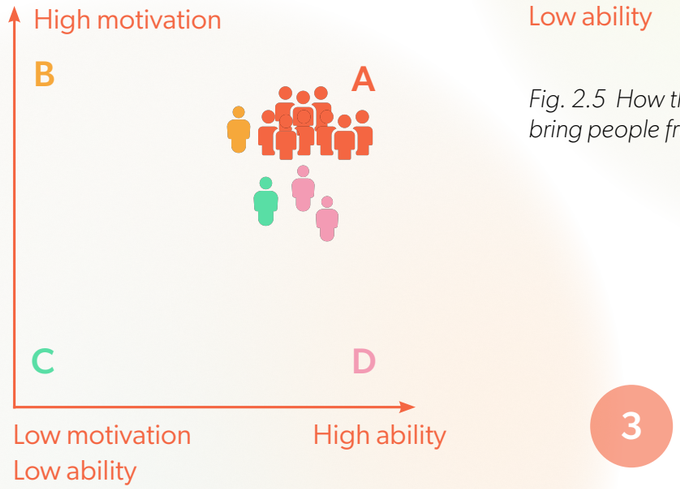


Fig. 2.6 What interventions could be applied for bringing people to segment A and triggering them at the same moment?

2.3 UNDERSTAND CONSUMER BEHAVIOUR

Research questions explored in this section

- *What are the current behaviours?*
- *What are the key factors that influence their behaviour?*
- *How do the key factors influence their behaviour?*

2.3.1 User research questions and research activities

After exploring Fogg's behaviour model and influential factors, I developed a list of sub research questions for the user research. These questions served as a guideline to ensure the research activities were structured and in the right direction.

To answer all the research questions, I conducted three research activities that targeted different research questions separately. The detailed approaches of each activity are described in the subsequent sections.

User research activities

Service safari

↓

Research question marked with green dots

Benchmarking

↓

Research question marked with pink dots

User interview

↓

All the research question

User research questions

User behaviour and experience

- Where do consumers purchase Grooming products?
- How long is the life cycle of Grooming devices?
- In what situations would the consumers start to face the EOU?
- What are consumers doing with the unused Grooming devices?
- How do different states of the old Grooming device influence the EOU behaviour?
- How is the user experience with the current Grooming take-back service?

Ability to return

- What is their ability to return the Grooming products?
  - How is the personal knowledge of Grooming and other return programs?
  - How is the accessibility and usability of the current and potential future infrastructure?
- Why is their ability low/high?

Motivation to return

- What is their motivation to return the Grooming products?
  - » What is their perceived image of return programs? Why do they have such a perception?
  - » What is the perceived value and effort based on their previous experience or assumption?
  - » What are their existing habits during EOU?
  - » Why do they recycle/return other products such as papers and plastics, but they don't return/recycle shavers?
- Why is their motivation low/high?
- What are their needs during EOU?
- Why their motivation is higher for other divestment options than for return? What are the factors that influence their decision?

User's desired return program

- How is their desired return program like?
- What factors do they value when evaluating a return service?
- Will consumers be interested in buying refurbished Grooming products?

2.3.2 Service safari: Exploring existing EOU services for Grooming products

Service safari is a design tool that encourages designers to go out "into the wild" and explore examples of what they think are good and bad service experiences (Stickdorn et al., 2018). As the first research activity, I did a service safari to put myself into the context as real consumer. This activity can help me to gain a deeper understanding of user behaviours so that I can formulate more targeted interview questions and have more deeper conversations with users when conducting further interviews.

Mapping the existing services with EOU scenarios

Approach

This section aims to explore the following research question:

- *What are consumers' potential needs during EOU?*
- *How do the existing services meet their needs?*

To answer the research question, I explored Philips online and offline EOU services by visiting Philips official website and asking the staff in retail stores. As a result, a service mapping was developed to illustrate how Philips's existing services correspond to consumer EOU needs (Figure 2.7).

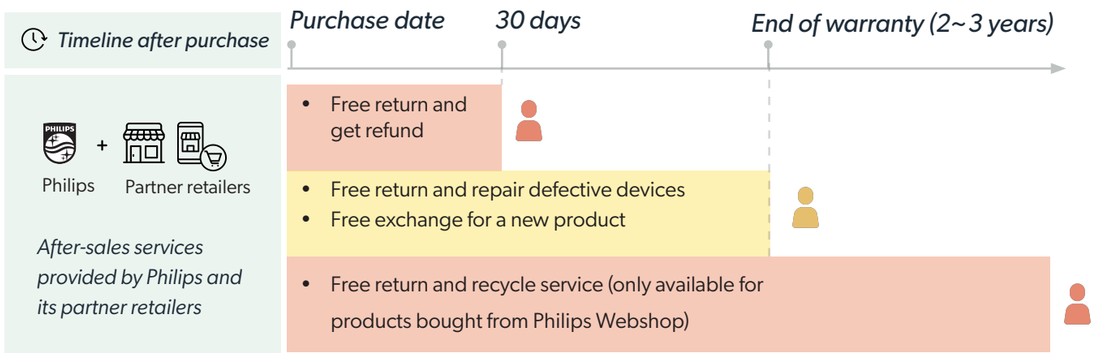


Fig 2.7 Mapping the existing services with EOU scenarios

Key findings from mapping the existing services with EOU needs

Figure 2.7 shows the mapping of Philips's existing services with a user's EOU needs. For users who want to extend the use cycle, Philips offers free repair and exchange service within the warranty. For users who want to end the use cycle, Philips allows users to free return without giving a reason and get refund within 30 days and free return to Philips to recycle at any time after the purchase.

As shown in the figure, Philips and partner retailers provide increasingly fewer EOU services as the purchase time gets longer, which is reasonable from a business perspective but may also cause several problems. First, for users who want to extend the use cycle after the warranty, an unavailable repair service may result in the user being forced to terminate the use cycle, which has negative impact on closing the loop. Second, for users who tend to end the use cycle after 30 days of purchase, Philip's recycling service is limited as it only accepts products bought from Philips online shop. This may result in users considering other divestment options so that Philips could not take back the used devices. Finally, the barriers in using all the existing services may also result in users not being able to meet their EOU needs through Philips.

In conclusion, the existing services of Philips and partner retailers may not be sufficient to meet a user's EOU need, which could result in the user passively terminating the use cycle or Philips being unable to take back old devices from the use. If Philips wants to close the loop, it is necessary for them to optimise the existing services and support users to complete their EOU journey.

Exploring the commercial return and free recycling service

To optimise the existing service, it is crucial to first understand the experience of existing services. As the project mainly focuses on the EOU scenario of ending the use cycle, I explored Philip's commercial return and free recycling service, which are two possible ways for the user to detach with the products at Philips. This section aims to answer the following research questions

- How is the user experience with the current Grooming take-back service?
- How is the accessibility and usability of the current and potential future infrastructure?

i. Exploring the commercial return experience

Philips doesn't have independent physical stores, so the personal health products are mainly sold on Philips online shop and other online or physical retailers. This activity aims to experience the commercial return process on these two types of platforms, that is, to return within the 30-day refund period.

Approach

To experience the commercial return service on two platforms, I bought a Lumea IPL hair removal device from Philips Webshop, which is Philip's official online shopping platform, and a nose trimmer from Amazon. The two journeys were documented and represented together in a user journey map (Appendix D), consisting of two key stages: purchasing and returning. Documenting these two phases aims to investigate how the platforms inform consumers about the return service during the purchase and how users experience the return process at the shopping platforms.

Insights from the exploration

Influencing factor:

Lack of informing during the purchase stage

<u>The user is not well informed about both commercial return service and recycling service during the purchase stage.</u>

When purchasing the new product on Philips Webshop, a user will not be informed about the return policy and recycling service unless the user actively searches for it (Figure 2.8). Moreover, the return service page entrance is hidden at the bottom of the page, which makes it difficult even when the user is actively searching. Overall, although the purchase process is smooth and user-friendly, not well informing the return service, in the beginning, can lead to a lack of relevant knowledge when a user is facing EOU.

Influencing factor:

Lack of guidance to support a user with the return process

<u>The return instructions are unclear on the product invoice, package and user manual</u>

The instruction on the product invoice (Figure 2.11) did not offer a clear path to start the return process online. In addition to the invoice, there were no specific instructions on the product package and user manual (Figure 2.12) about the return process. The ambiguous instruction may increase the confusion for those who had little return experience at that shopping. It was easy for me to access the Amazon account and complete the return as I have experience with the returns at Amazon. But when it comes to Philips Webshop, I got confused to start as I

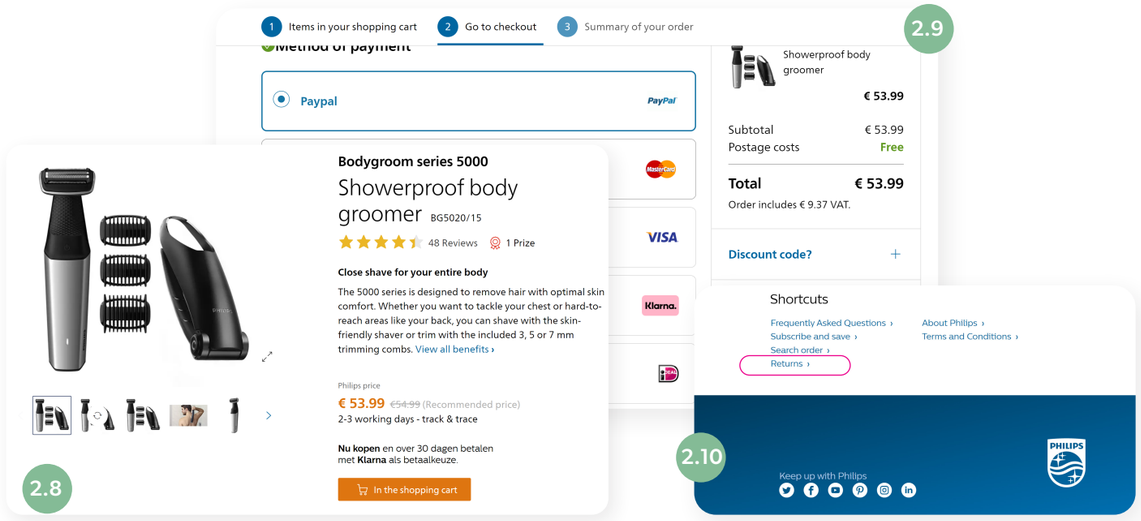
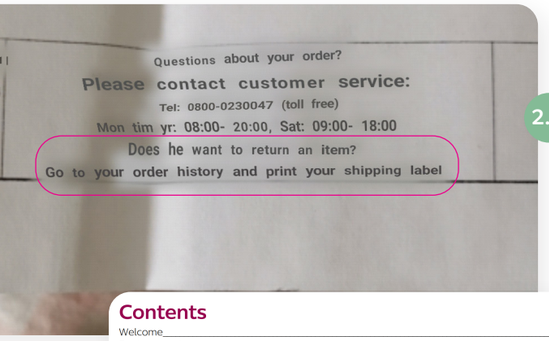


Fig 2.8, 2.9 The user will not be informed about the return policy and recycling service during the purchase process on Philips Webshop

Fig 2.10 The return service page entrance is hidden at the bottom of the page



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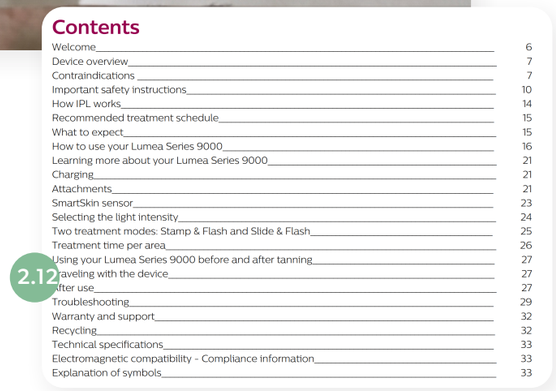
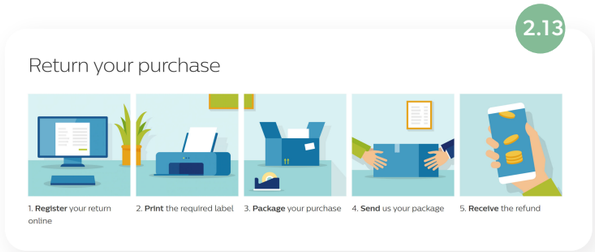


2.12

Fig 2.11 The Lumea invoice did not offer a clear path to start the return process online.

Fig 2.12 Lumea manual content. It's not easy to find the return policy from the Lumea manual



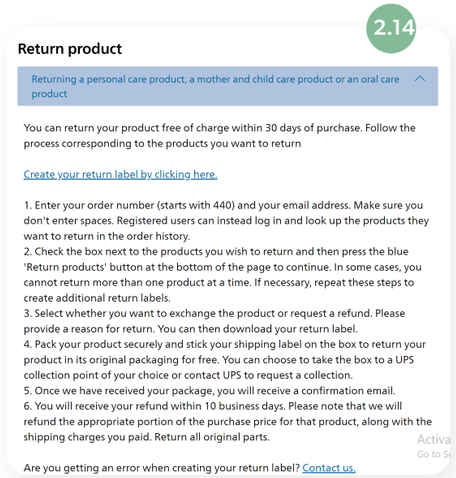
2.13

Fig 2.13 The steps are not clickable. The user still needs to find the service entrance from the website navigation at the bottom.

had no experience with it. As a user may start looking for information from the physical package and user manual, it is important for Philips to create supportive and clear guidance on those physical touchpoints to help users start the divestment journey.

The return instructions from Philips Webshop are overwhelming

Although the website displayed a visualized returning process, it wasn't easy to directly access the entrance of the return service as the steps are not clickable (Figure 2.13). Further, after entering the return service page, the return instructions were overwhelming due to a large amount of text (Figure 2.14), which increased the mental and physical effort for the divestment process.



2.14

Fig 2.14 The return instructions

An unclear return condition can lead to a user's concerns about returning a product

The return service page (Figure 2.14) of Philips Webshop did not list detailed return conditions such as packaging requirements and product usage requirements, which can lead to a user's concerns of whether the product could be returned successfully. This may result in users deciding not to return when the product is relatively cheap as users may be unwilling to spend effort returning while the refund outcome is unclear.

Influencing factor:

The usability of service infrastructures

Contact customer service by phone or online chat may increase a user's mental effort to return

When getting an error for requesting a shipping label, I needed to contact the customer service by phone or online chat, which increased my mental and physical effort to return as I prefer an intuitive autonomous process instead of one that requires communication. While this might also be a pain point for some users, others may prefer direct communication rather than autonomous digital service. But if this service system cannot ensure its low error rate, the ways to support consumers can be optimized.

Printing a shipping label might be a barrier for some users

In contrast to some other brands who send consumers new products with a pre-paid shipping label for return, Philips Webshop required users to request a shipping label online by themselves, increasing some users' effort. Although it's possible for some logistic services to handwrite a shipping label, there are no instructions on Philips Webshop about the alternatives when not able to print a label. Overall, a user who does not have a printer may have a lower ability to return products at Philips Webshop.

UPS service points that are far away may increase a user's effort to return

It increases the effort for a consumer who doesn't have a printer at home and doesn't have a UPS service point nearby. When the UPS service point is far, it may lead to the consumer postponing or forgetting to return.

Amazon refunds some products without requiring a return, which may result in the user continuing to face an EOU dilemma

I failed to return the nose trimmer to Amazon due to Amazon's "refund without return" policy. This policy gives users a refund without taking it back when the product value is low compared to the logistic costs ("Amazon Refund Without Return," 2021). In the end, I needed to look for other divestment options. Accordingly, Amazon's "refund without return" policy could not completely solve the user's EOU dilemma, making it difficult to close the loop.

ii. Exploring the free recycling service

According to the mapping of existing services and EOU needs, the recycling services are the only divestment options offered by Philips and partner retailers after the purchase of 30 days. Therefore, after exploring the commercial return service, I tried the recycling services offered by Philips Webshop to get a deeper understanding of the "return to recycling" experience.

Approach

To explore Philips recycling service, I first started with looking for the recycling service from product package, user manual, Google and Philips Webshop. After I found the service, I conducted an evaluation and decided whether to use the service. The nose trimmer bought from Amazon was used for exploring the recycling experience. As a result, a user journey map was developed to represent the entire process (Appendix D).

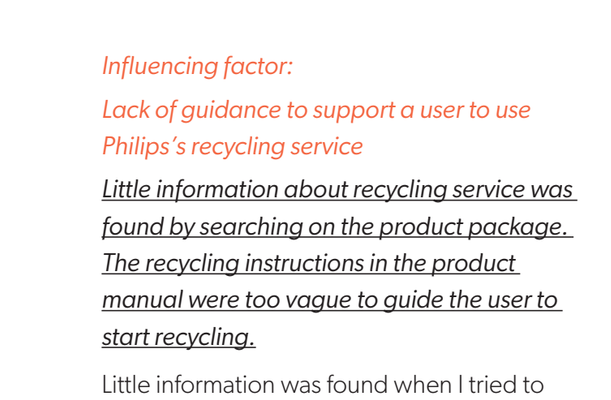
Insights from exploring the free recycling service

Influencing factor:

Lack of guidance to support a user to use Philips's recycling service

Little information about recycling service was found by searching on the product package. The recycling instructions in the product manual were too vague to guide the user to start recycling.

Little information was found when I tried to look for the service details from the product package. For example, the nose-trimmer manual asked users to dispose of the device at e-waste collection points without mentioning Philips's free-recycle service. When I checked Lumea's user manual (Figure 2.15), it suggested that the user recycle at an official collection point or go to a Philips service centre to have a professional remove the battery. However, it didn't provide detailed information such as the name and the location of the service points. The vague instructions may cause users to feel confused and decide against this option.


or read the international warranty leaflet.

Recycling

- This symbol means that this product shall not be disposed of with normal household waste (2012/19/EU).
- This symbol means that this product contains a built-in rechargeable battery which shall not be disposed of with normal household waste (2006/66/EC). Please take your product to an official collection point or a Philips service center to have a professional remove the rechargeable battery.
- Follow your country's rules for the separate collection of electrical and electronic products and rechargeable batteries. Correct disposal helps prevent negative consequences for the environment and human health.

Please take your product to an official collection point or a Philips service center to have a professional remove the rechargeable battery. Philips Lumea products contain recyclable materials and should not be put into the municipal waste stream. Refer to the Philips Lumea support website for recycling options. Do not dispose of in fire.

Fig 2.15 The Lumea manual says "Please take your product to an official collection point or a Philips service center to have a professional remove the rechargeable battery", but it doesn't mention the location or contact.

The recycling service has low visibility on Philips Webshop

It's not difficult to find the product return service by putting "Philips Grooming return" keywords in search engines. After being guided to the service page, users can easily find the recycling service information under the button "how to hand in the old device". However, when I tried to look for the service directly from Philips website "customer service" navigation category, the return service was not included (Figure 2.16). Instead, the service shortcut was at the bottom of the website, which may be difficult for users to find.

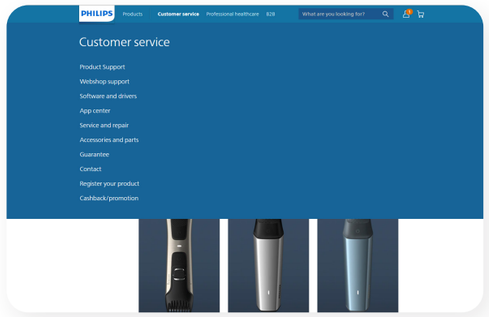


Fig 2.16 The return category is not included in the customer service navigation on Philips online Webshop

The return conditions might be difficult for some users to follow

According to the instructions for handing in an old device to Philips, the user must follow a list of conditions such as "empty and clean the device (free of liquids and grease) and "any loose parts are properly secured". On the one hand, the conditions were only represented in text, which was not very intuitively understandable; On the other hand, the requirements may generate effort for a user to follow completely.

Influencing factor:

The usability of service infrastructures

The Wecycle service was not usable, and Philips free-recycling service only applies to products bought from Philips Webshop while it contains charges for products bought from other platforms

According to the conversations with Philips's customer service, Philips recycling service would only be free for the products bought from Philips Webshop. Otherwise, the user has to pay for the shipping cost, around six euros. As my nose trimmer was bought from Amazon, the staff suggested that I keep using it or drop it at municipal collection points. Therefore, if the old product is purchased from other retailers, the user will likely choose other disposition options instead of Philips recycling service. The conversation with Philips customer service is as below:

"Hi, I bought it from Amazon two months ago and it's not possible to return it now. I saw there's a free return and recycle service on your website that I can hand in my own device to you to recycle. So I wonder can you create a return label for me?"

"Rather than give it to us, to tell you the truth, we suggest you keep it because maybe you will use it or maybe not. But you can just keep."

"But I don't use it anymore. I also have some old Philips shavers that my father doesn't use. Is it possible to hand in all of the devices together to Philips so they can be recycled?"

"Then you can just recycle it (at waste collection facilities). It will be taken by municipality. It's not necessary to send them to us. We do that only if the product is bought by Philips online shop. This (recycling service) is indeed a process, but the sending cost will not be a satisfactory rating. So if it is bought from the Webshop then it can be sent back for free. If it's not then the sending cost will be like six or seven euros and you need to pay by yourself."

Conclusion of service safari

Philips and its partners' existing services may not be sufficient to meet users' EOU needs, which could result in difficulties for Philips to close the loop. In order to offer a better user experience with ending the use cycle, several factors need to be considered for optimising Philips's existing commercial return and recycling services. First, a service promotion during the purchase stage can lead to a higher awareness when users face EOU. Second, a supportive and seamless EOU guidance that covers multiple touchpoints is important for Philips to involve users in the EOU services. Third, a service with simple infrastructures and reasonable conditions can reduce users' effort for divestment. By optimising these factors, a user may have a higher ability to use the divestment options offered by Philips.

2.3.3 Benchmarking on business model and strategies

Analysing business strategies that facilitate consumer's return behaviour during EOU

As the circular economy has become a prominent concept to drive sustainability transitions in business (Bocken, 2021), an increasing number of strategies have been taken by companies to facilitate consumers' return behaviour. This section aims to analyse other business strategies that motivate consumers to return.

As a result, three service schemes were summarized and analysed based on the benchmarking outcome (Appendix C). The strategies' desirable features could serve as inspirations for initial ideation and be evaluated with users in further interviews. On the other hand, the downsides of the strategies could be taken as criteria for further design.

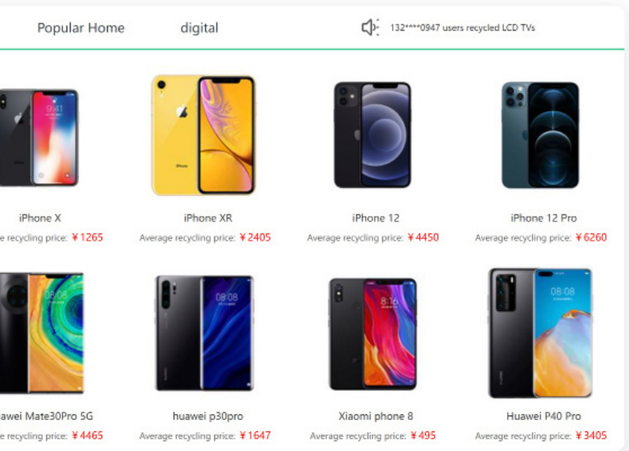


Fig 2.17 The electronic retailer Suning accepts multiple brands for trade-in. The voucher applies to various brands and products

Strategies that promote consumers' return behaviour

Strategy #1

Trade-in program

Using financial compensation as an incentive to attract users to return old products is a trending take-back business model. By analysing several trade-in programs. The key insights were formulated as below:

Insight

A voucher with a wider range of purchase choices may increase the motivation to return

Consumers may have higher motivation when the trade-in voucher applies to a larger range of the new purchase. Some electronics retailers offer trade-in voucher that can be used for any product, such as returning an iPhone and getting a discounted Samsung laptop (Suning Tesco Trade-In, n.d.) (Figure 2.17). This may attract users who are interested in different product types or different brands, which increase people's motivation to return. However, if the benefit is too attractive, it may also cause the prematurely replacement of the device. Chances are that users might return the device before it reaches the end-of-life, which lead to the rebound effect and negative impact for the environment.

Insight

Offering real-time incentives may increase motivation

Nespresso provides random prizes for consumers who recycle coffee capsules (Nespresso, n.d.) (Figure 2.18). Although the prize may be attractive, some consumers who desire to get a prize are likely to lose interest and stop recycling if they never win a prize. According to previous studies, feedback is more effective for sustainable behaviours when presented in real-time (Chiang et al., 2014; Fischer, 2008; Karjalainen, 2011). Therefore, minimising the time of receiving incentives may increase and maintain people's motivation to return.

THIS IS HOW YOU WRITE SUSTAINABLY

The Caran d'Ache pen is made from used **Nespresso** capsules. In this way we work with you towards 100% recycling.

Fig 2.18 Nespresso offers random prizes made by recycled coffeepods

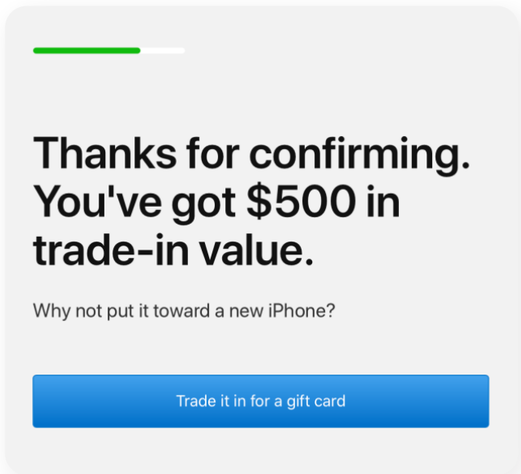


Fig 2.19 The estimation result of Apple Trade-in service

Insight

A proper estimation for the compensation value could maintain the motivation for the next return

Many trade-in programs estimate a compensation value by evaluating the product condition before collecting. However, consumers may have a negative experience if companies promote a higher trade-in value that they actually can give. Therefore, an accurate and transparent estimation system may add to a good return experience and raise people's motivation for the next return.

Strategy #2

Access instead of ownership

Some subscription services allow consumers to "rent" a product without paying full price. Consumers can end the use cycle anytime during the contract and return the product or permanently keep the device and pay the rest of the price. This service is suitable for a relatively expensive product or a product with low usage frequency.

Insight

A subscription contract may be an effective prompt and motivator

When users don't return the product at the end of a contract, they would be charged for a new round of subscription or the full payment. Therefore, the contract may act as a motivator, and the end date of subscription is a strong prompt for the return behaviour at EOU.

Insight

Sending an upgraded product to consumers may be a good prompt

The iPhone Upgrade Program (Apple, n.d.) is a subscription plan that offers users a new iPhone every year (Figure 2.21). Users need to pay Apple a monthly fee for the device. At the end of one-year use, Apple will ship users a new phone, plus a return kit to return the old one (or users can exchange in-store). Sending an upgraded device may be a good prompt to trigger the user to return the old one. Moreover, the return kit reduces users' effort to trade-in, raising users' ability to return. The downside of this strategy is that the smartphone use cycle is shortened to only one year, which is not sustainable.

Fig 2.20 Lumea Try&Buy service offers 3-month subscription (Lumea, n.d.)

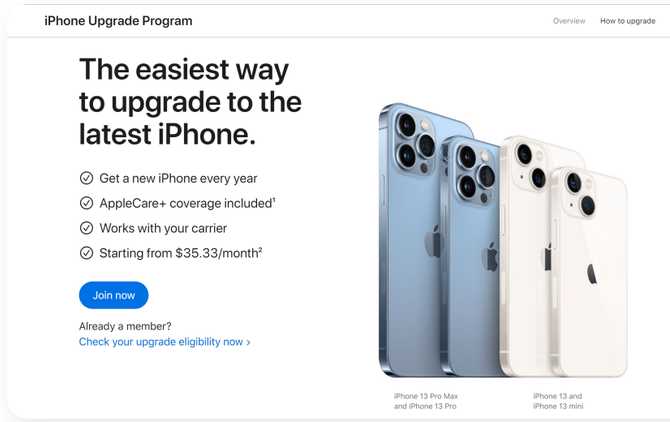


Fig 2.21 Apple Upgrade Program offers users the newest iPhone every year

Strategy #3

Donating used products to charities

Insight

Feeling of 'doing good' may increase the motivation

The pleasure of donating may motivate consumers to return. LEGO's Replay program (Replay, n.d.) allows users to donate their unused LEGO blocks for kids in need (Figure 2.22). In Grooming's context, the donation strategy may be less attractive as there is less sentiment in the shaver's donation in contrast with the toy donation. However, the feeling of 'doing good' could still be a useful intervention to motivate return. The further ideation can think about how to motivate people by making their actions create value to others.

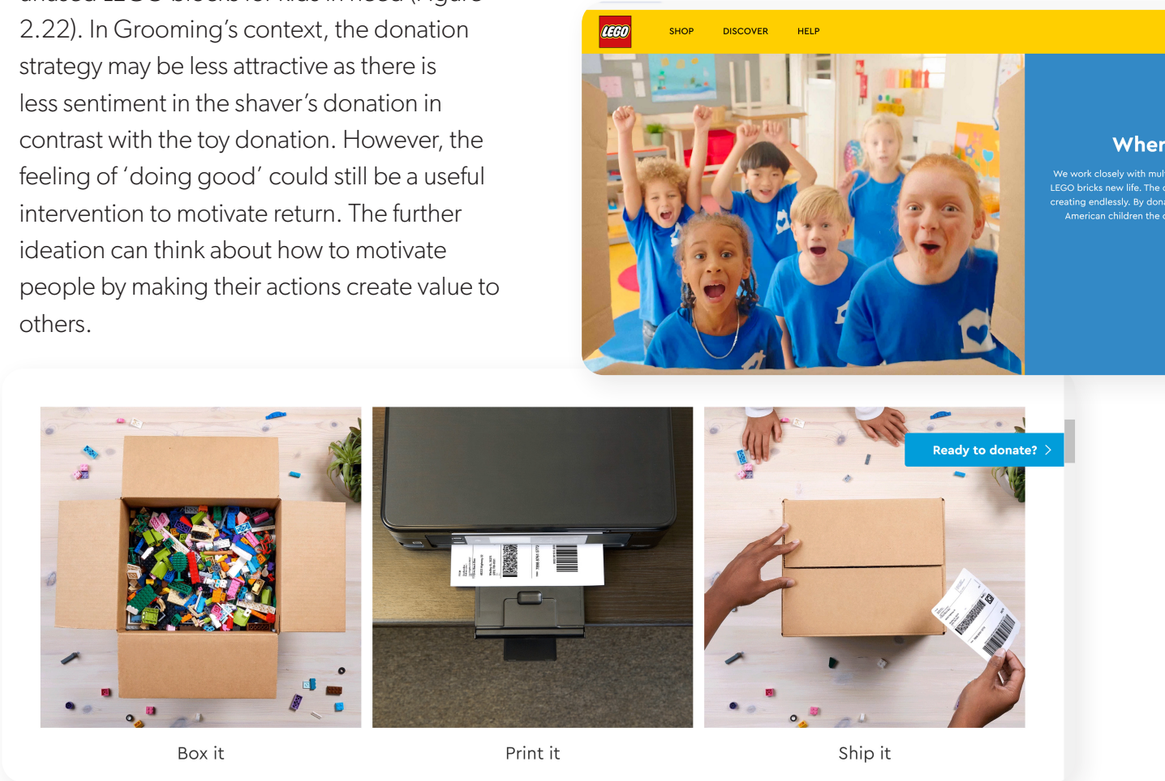


Fig 2.22 Lego Replay donation program

Conclusion of benchmarking

The benchmarking analysis shows different strategies that attract people to return the products. While providing financial benefits in the trade-in program and providing upgraded products in subscription service could increase people's motivation to return the used product, several rebound effects will lead to unsustainable outcomes. These findings are valuable to be considered in the further development and reflection phase. The strategies can be used for validating with users in further in-depth interviews.

2.3.4 In-depth interivews

This section aims to explore the all the user research questions by gaining users' perceptions and behaviours during the EOU scenario. The interviews were done in a semi-structured way to gain broader insights. The questions were generated based on the research questions and insights from the earlier service safari and benchmarking. The interviews were conducted in a flexible way according to different participants' experiences.

User research group

In order to find more participants for the interviews and get a more comprehensive understanding, the user research had a broader scope, which targeted on any brand's Grooming users who are currently facing EOU or had experienced EOU. This includes two types of EOU scenarios: (1) users want to keep the product in the current use cycle but failed to do it; (2) users want to end the product use cycle. In later define and develop phases, only people facing the second scenario were selected as target users because the project scope was narrowed down after discussing with the supervisory team.

About the participants

According to the requirement of research target group, the participants should meet the following conditions:

- The person had used at least one grooming product.
- The person is currently facing EOU or had experienced EOU of the Grooming product(s).

Thirteen interviewees were recruited through my personal network and online questionnaires. The composition of participants is listed in Figure 2.23. All the participants are male who has experienced EOU of Grooming products from Philips or other brands and have already stopped using the device. Due to the limitation of the personal network when recruiting, most of the participants are aged between 18~40 years old. Only two participants are older than 40 years. Furthermore, as this project focused on the European market, 12 participants are living in Europe, and 6 participants grew up in Europe.

All the interviews were conducted online. Each interview session took around 40 minutes. The interview questions can be found in Appendix E. Due to my laptop's technical issue, some interviews were not successfully recorded. Notes were taken and summarised for futher analysis.

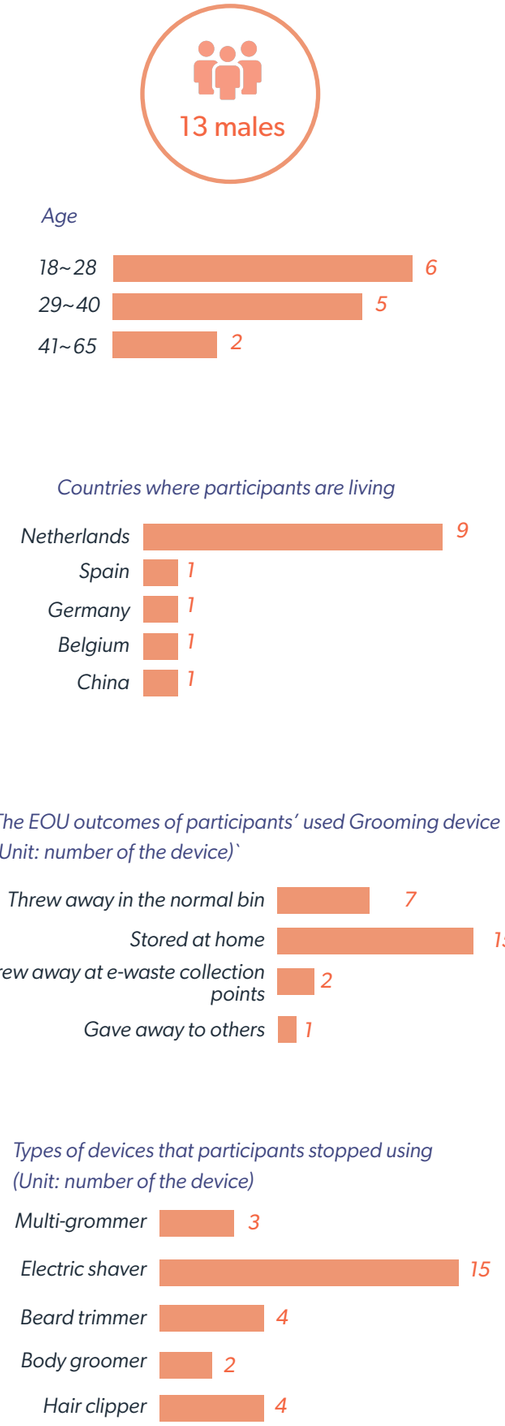


Fig 2.23 Participants information

Data analysis

Methods

Defining the user journey phases

To better summarize and analyze the interview data, I developed a four-phase EOU journey to organize the user research findings (Figure 2.24). This process is a adapted version of the analytical cognitive model of divestment process as shown in Figure 2.25 (Blackwell et al., 2017; Cruz-Cárdenas & Arévalo-Chávez, 2018; Hanson, 1980). Because some participants experienced more than just divestment process but also other EOU scenarios, this divestment process model could not fully summarize the interview insights. Therefore, "divestment" was replaced with "EOU", and the process was simplified for easier documenting.

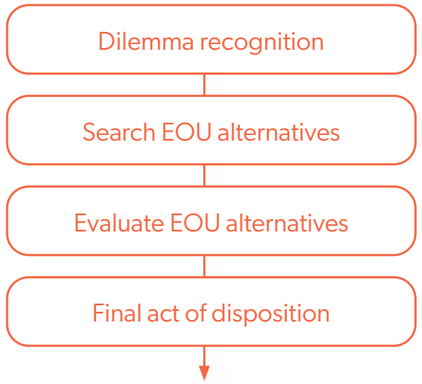


Fig 2.24 EOU journey for documenting the research findings

Fig 2.25 An analytical cognitive model of consumer behavior for divestment (Blackwell et al., 2017; Cruz-Cárdenas & Arévalo-Chávez, 2018; Hanson, 1980; Roster, 2001)

User journey mapping

The data consists of notes from service safari and interviews transcripts. To develop a comprehensive interpretation, I organized a workshop with two other design students.

In the first step, participants were asked to write statement cards and map them on the EOU journey process on the wall. To make a statement card, the participants needed to first read the transcripts from interviewees, abstract the information to different depth level, and then write down the interpretation in their own words. Finally, the quotes were cut down and pasted with the interpretation sticky notes. Using sticky notes with different colours ensured the identification of each participant and helped to make the further discussion efficient.

After the statement cards were mapped on the EOU journey, we started clustering and discussing the interpretation. The relevant cards were put together and classified according to user needs, user behaviour, and the influence of factors. As a result, the data were interpreted in an explicit way.

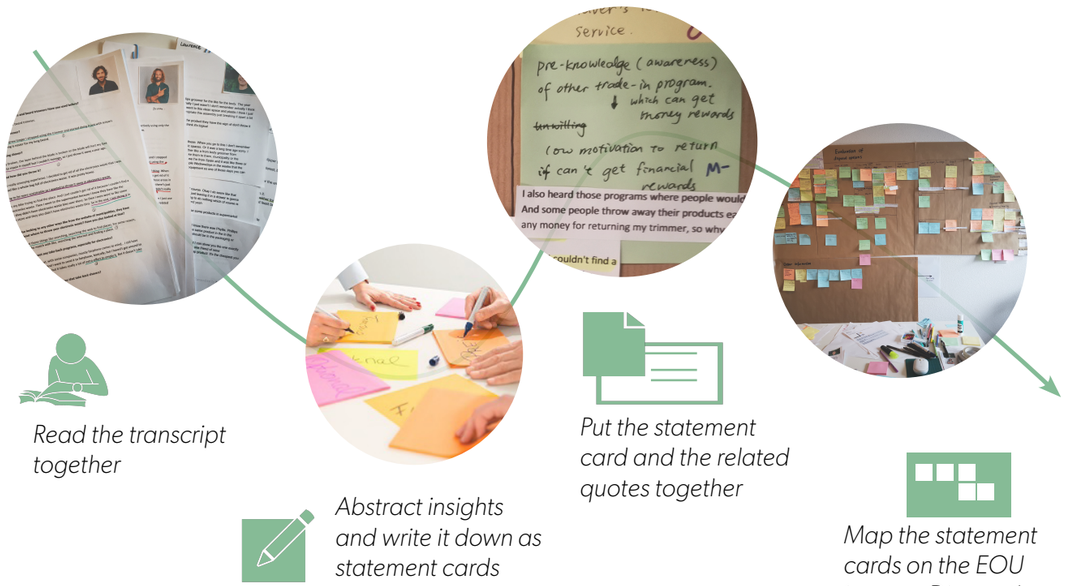
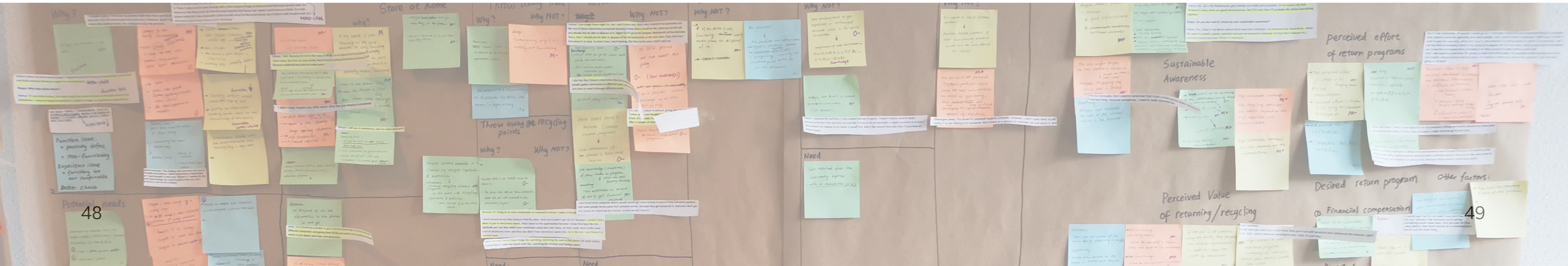


Fig 2.26 The method for data analysis



Phase 1: Dilemma recognition

The divestment process starts with recognizing a dilemma about whether to keep the product in the current use cycle or end the product use cycle (Poppelaars et al., 2020). This section first analyses the causes that Grooming users started to face the EOU, and then discusses how the relevant factors affect a user's motivation and the ability for divestment.

Findings related to current user behaviour and experience:

Insight: There are three main causes for EOU (Figure 2.27): (1) product function issue, (2) negative usage experience caused by personal reasons, and (3) a better choice or the need no longer exists.

1. Product function issue

When the device has functional problems such as the battery issue or blades issue, participants may start to face the EOU as the functional issues seriously affect the user experience. Some participants decided to stop the use cycle when facing function issues, while some others stopped the use cycle after an unsuccessful self-repair attempt.

"The layer behind the blade is broken, so the blade will hurt my face sometimes."
"I tried to repair it myself, but I couldn't manage, so I just threw it away a year ago."

"I don't know how to repair it, so I just bought a new one."

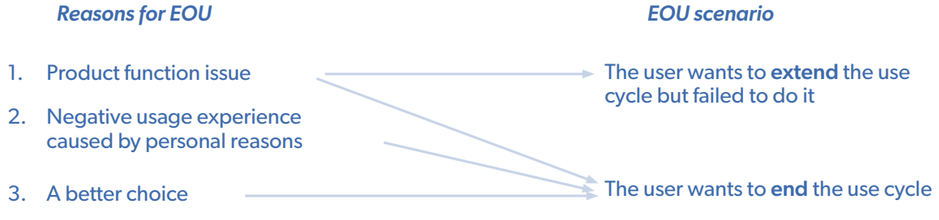


Fig 2.27 The main causes of EOU and the corresponding EOU scenarios

2. Negative usage experience caused by personal reasons

EOU may also happen when the device is fully functional. Some participants feel uncomfortable using the device due to personal reasons such as skin allergy reactions. As a result, they decided to end the product use cycle.

"I didn't feel comfortable due to my skin-related issues."

3. A better choice or the need no longer exists

When some participants had a better choice over the old device, they intended to stop using it although it's fully functioning. For instance, they decided to discard the old ones after they bought an updated product with new technologies.

"I stopped using the trimmer and started doing it with scissors because I think manual shaving is easier for my long beard."

"I stopped using the groomer because my partner didn't like how I got rid of the hair on my chest."

Insight: The dilemma recognition can be activated when a user reaches EOU moment, when the storage is full or when a user is facing specific events (e.g., moving, house-cleaning)

The first dilemma recognition moment usually occurs when the user just reaches one of the three EOU scenarios mentioned above (i.e., device function issue, personal negative experience, or a better choice). If the user delays the decision making, the next time of dilemma recognition moment could be sparked by a spontaneous decluttering, which may happen when the storage is full or when the user is experiencing critical changes in life such as house moving. This activation may take place long after EOU.
"So as long as it's not in a way you're not throwing them away. But then at some point, they're piling up and then you're throwing everything away, because suddenly you want to make space."

Factors that influence users' motivation for divestment

The condition of the old Grooming device

When participants are facing the EOU, the old device could be either functioning or defective, which can lead to different levels of motivation for divestment (Figure 2.28).

The device is still functioning:

It's painful to detach with a functioning Grooming device with the known disposition options

When participants start to face EOU while the device is working properly, whether to keep it becomes the hardest decision to make. Most participants chose to store the devices, and some expected occasional use in the future. This is because participants perceive a lot of remaining value left in the old device (Figure 2.29), but the disposition options in their minds (e.g., throw away and recycle) couldn't offset the loss of value. This resulted in their mental pain for divestment.

"I'm not a fan of throwing things, like this trimmer that I've been using for seven years."

"I tried to give it a chance, to use it somehow. But it's still damaging my skin. Maybe my problem was in the first place."

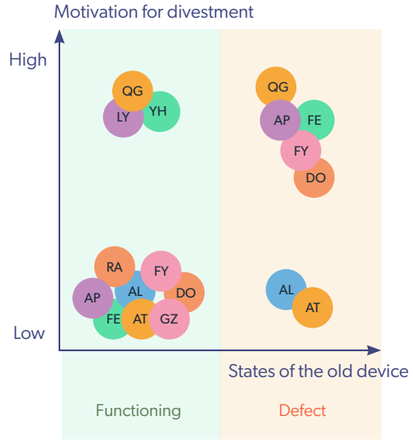


Fig 2.28 Mapping of participants' motivation for divestment according to the states of their old devices

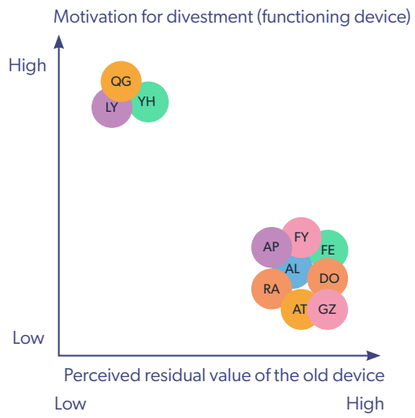


Fig 2.29 Mapping of participants' motivation for divestment with the perceived residual value of a functioning device that is reaching EOU

The motivation for divestment can be higher if the device's use-value is not wasted: The possibility of giving away a functioning hair clipper is more attractive than storing at home.

Due to the hygienic concerns, functioning Grooming devices are usually difficult to give away or resell, but this is possible for a hair clipper. As hair clippers don't touch the skin directly, there are fewer concerns about giving or receiving a second-hand hair clipper. Unlike other participants who never thought about selling shavers, two participants (LY & YH) saved the hair clippers for further giving or reselling opportunities. They have higher motivation to divest as the options can offset the use-value and financial-value left from this device.

"It's more important to me if the hair clipper can be used by someone who needs it. I'm selling at an extremely low price because I don't really need the money back."

"The hair clipper cost me 30 euros, and it's brand new, so I'd like to sell it at 20 euros at least."

The device is defective:

Some have stronger divestment motivation as users perceived less value left in defective devices.

According to the interview, defective devices usually have battery issues or blade issues. Most defective devices are still usable but create a negative user experience, which leads to infrequent usage. Among all the people who chose to keep the functioning devices, some had stronger motivation for divestment when facing a defective device. This is because they perceived less value left in it (Figure 2.30) and, as a result, chose to discard the devices.

"The battery dies over time, so I just bought a new one, and the previous one is not needed anymore."

"If it stopped functioning, I might throw it. But if it's still working I will not. "

The divestment motivation remains low as some people still perceive lots of value left in defective devices.

On the contrary, some participants decided to keep broken devices. There

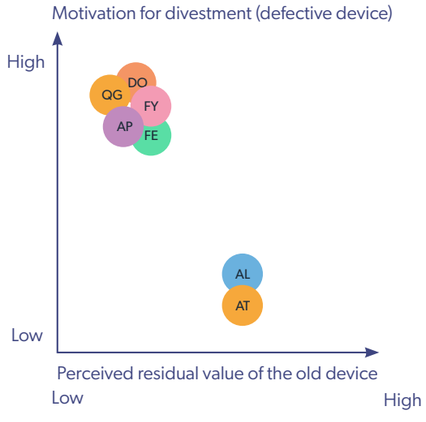


Fig 2.30 Mapping of participants' motivation for divestment with the perceived residual value of a defective device that is reaching EOU

are two reasons that lead them to keep the broken device. Firstly, some still perceive the device's remaining value as most components are still functioning, and the disposition methods cannot compensate for the value. For this reason, these people usually regard the defective devices as backup ones and expect some occasional use. But in fact, they hardly use it.

"Because the main part still functions, so it feels like a pity to really throw it away."

Low divestment motivation leads to delay decision-making, which results in the "forever" delay of divestment.

Secondly, Grooming devices are easy to store, which leads to the delay of decision-making. When some participants have low motivation for disposition, the devices are usually stored first and have gradually been forgotten. This also happened with their other electronics and caused a pile of electronics in the drawer.

"First, I need to remember that I have a body groomer (then I can start searching for the disposition options). I think this is an important thing."

Factors that influence users' motivation for divestment

Existing disposal habit

An existing routine of disposing of unused items increases the ability for divestment.

When someone has existing routines to dispose of unnecessary things, the divestment behaviour tends to be unconscious and natural, thereby reducing the mental effort and increasing the ability for divestment. The relationship between participants' motivation for divestment and their disposal habit is illustrated in Figure 2.31 and 2.32 separately based on the device condition. Two participants threw away functioning devices when conducting regular decluttering as they didn't like devices piling up at home. Moreover, they perceived less value left from the old device as they clearly knew that the device would be no longer used.

"I'm not a fan of storing things. I only keep what I'm actually using."

On the contrary, storing unneeded electronics has become a habit for some participants. This leads to low motivation

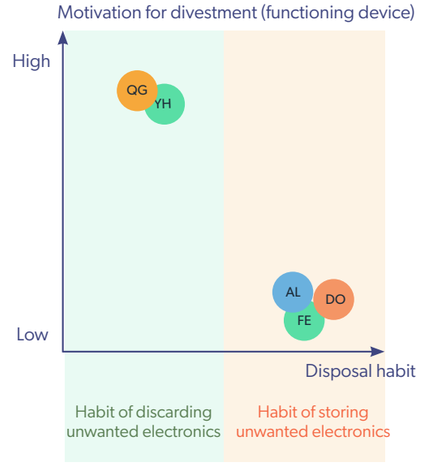


Fig 2.31 Mapping of participants' disposal habit with their motivation for divestment to detach with a functiong device

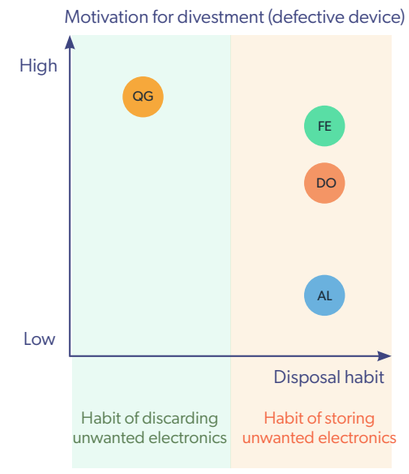


Fig 2.32 Mapping of participants' disposal habit with their motivation for divestment to detach with a defective device

for divestment action. Although they may be willing to dispose of the defective devices, they usually keep the devices until the storage is full, which results in the delay of the action.

"I have a drawer with different products, usually small devices, because it might be useful in the future, but I'm not really using them anymore"

Conclusion for findings in phase 1

In the dilemma recognition stage, the condition of the old device largely affects users' perception of its remaining value. A user with a defective device may have stronger divestment motivation than the user with a functioning device does. Then the motivation to conduct a specific disposition option is influenced by whether this option can compensate for the remaining value.
Furthermore, the existing disposal habit significantly influences one's ability to make the divestment decision. It's easier for people to dispose of unused electronics when they have an existing routine to do it. In contrast, a habit of hoarding unused electronics tend to prevent them from divesting and may result in a delay of decision making.

Phase 2: Search for EOU options

If the user has decided to end the product use cycle at the dilemma recognition stage, they will start searching for divestment options. The searching process consists of internal search (i.e., user's memory) and external search (e.g., word of mouth, internet, store visits) (Lars Perner, n.d.; Poppelaars et al., 2020). In this stage, users' motivation to return a used device is hardly affected while their ability to return is influenced by several factors. This section has discussed how the factors influence one's ability to return used Grooming devices.

Factors influence a user's ability to return used device through the take-back service

Personal knowledge on available services when facing EOU

A vague image of available Grooming after-services leads to limited disposition options.

Fig 2.33 shows available after-sale services offered by Philips and the disposition options considered by participants when facing EOU. The data was mapped based on the timeline after the purchase date. Overall, people were familiar with the 30-day return and refund policy. But they did not have a clear image of the further after-sale services, which led to limited choices for disposition during EOU.

On the one hand, when people need to keep the current use cycle, they may not consider sending a defective device to repair or exchange as they believe it contains a charge. As a result, they are likely to keep the device at home.

"I didn't even imagine that it's possible to return or exchange it after a couple of months usage."
"I think it could be expensive to send to repair. Maybe I'm using it in a wrong way and that's why it broke."

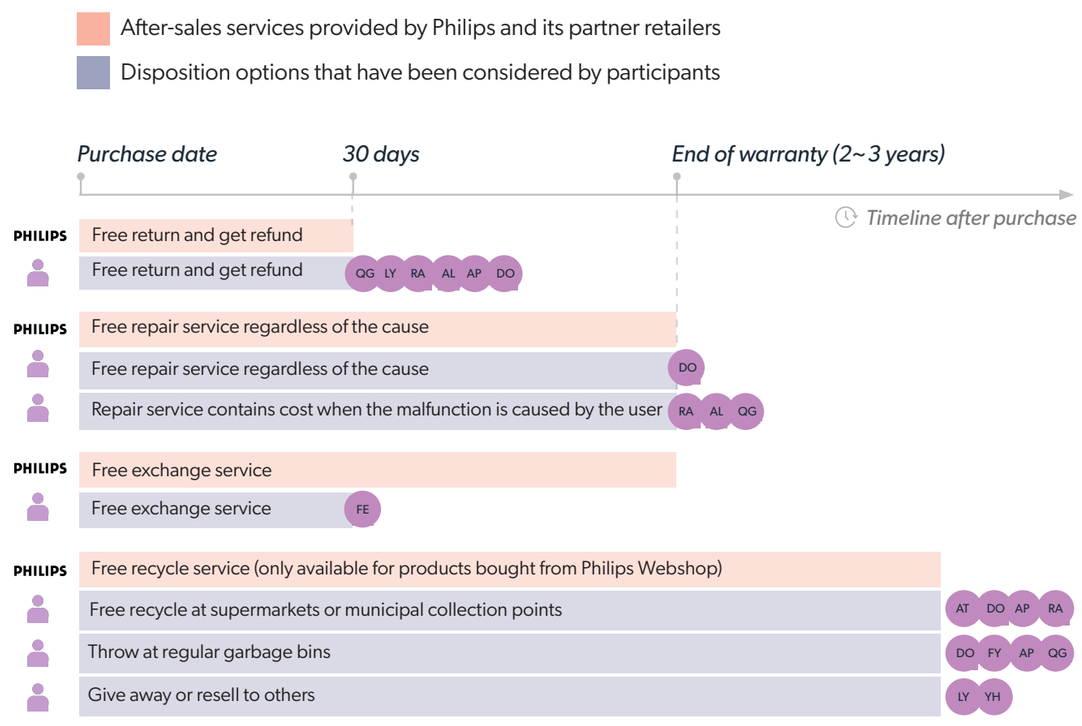


Fig 2.33 Mapping available after-sale services offered by Philips with the disposition options considered by participants when facing EOU

On the other hand, when people need to end the use cycle, they would not consider Philips recycling service due to a lack of awareness. Instead, they will either store the device at home or discard it through the last three options. In that case, dropping devices at recycling points are the most optimistic and sustainable outcome. But considering the unsustainable behaviour such as throwing electronics anywhere in the city, an attractive take-back service can effectively prevent people from throwing devices in normal waste bins and reduce their hoarding behaviours, which makes the EOU outcomes more sustainable.

"I don't really like things lying around in my cabinets but I don't really know what to do with them. If I bring it to the waste yard there's not going to be any value for me and I'm not going to get any discount so that is just trash."

"The previous shaver is not needed anymore, I don't really like to keep unuseful stuff so I threw it in the street bin… Collecting a shaver and bringing it to the collection place… it just doesn't make sense for me."

Lack of awareness of take-back programs leads to low ability to return used devices.

When searching for EOU options, people would hardly look for take-back services if they never heard about one. Here the take-back service indicates programs that collect used devices instead of the commercial return services with a 30-day return policy.

Figure 2.34 shows that the ability to return and the awareness of take-back programs are directly proportional. First of all, no participants had heard about take-back programs for Grooming devices, which indicates their low ability to return a Grooming device.

"I can imagine there might be (some Grooming take-back programs). But I don't know any."

However, most participants were aware of other take-back programs such as Apple Trade-in and H&M clothes recycling program. This is a promising insight as it means the Grooming take-back service is likely to be acceptable for most users. It's also less difficult to search for information when people have pre-knowledge about similar services. In contrast, two participants had no knowledge about any take-back programs. Lack of awareness may increase their mental effort to search and understand

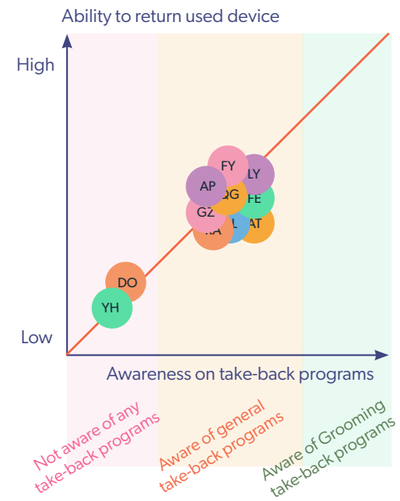


Fig 2.34 The relationship between Participants' awareness on take-back program and their ability to return devices through Philips take-back service

the information, thus leading to a lower ability to return.

The visibility and accessibility of Philips's current take-back service

It's hard to get informed about Philips's current take-back service, which leads to users' low ability to access it.

Visibility refers to how well the service information is conveyed to users. Accessibility means how easy the user could find and reach the service. As most participants are familiar with the commercial return within 30 days, I would like to explore how they might search for Philips's existing free-recycle service. Ideally, the free-recycle service should make users informed about its existence and the way to participate. If the service has low visibility and accessibility, people can hardly find this service during the external search. According to the interviews and earlier service safari, users are likely to know this service by unconsciously getting informed and searching it proactively. During this process, several factors were found that influence the ability to return.

Users have little opportunities to get informed throughout the regular buying process.

As discussed in the earlier service safari, there was no information or introduction related to the free-recycle service in physical retail stores and shopping platforms such as Philips Webshop and Amazon. Apparently, the EOU experience has been less valued by Philips than the purchase experience. Insufficient information delivery reduces users' ability to return the used devices.

<u>The existing ways of informing are limited, which cannot well inform users as they acquire information through different channels.</u>

Most younger participants (25-40 years old) found return services such as Apple Trade-in mainly through the Apple store, Apple webshop, and social media. On the contrary, the older participants (>50 years old) learnt about waste collection information mainly from their friends, neighbourhood and local community. Moreover, two younger participants said they were not good at searching for information online. As Philips's free-recycle service can only be accessed digitally, people who are not used to searching information online would have few opportunities to access the service, thereby having low ability to return.

The alignment between the (potential) return method and the purchase method

<u>If the return method closely connects with the original purchase process, users have higher ability to find the take-back service.</u>

Participants usually connect the product after-services with the original purchase methods. Philips doesn't have its own physical stores and the products are usually sold at retailers such as MediaMarkt or Amazon. Therefore, participants tend to look for product after-services by checking at the retailers instead of at Philips.

"I don't know any (take-back programs) and that's why I looked at the supermarket electronics companies. Because where you buy the stuff, you should also be able to dispose of it. Right?"

"I went to the supermarkets because I know they have lightbulb bins but they didn't have electronics waste bins over there. So then I went to electronics stores and they also didn't have electronics waste bins. So in the end, I just threw it in normal trash."

Philip's current free-recycle service can only be accessed by its official website. If Philips intends to inform users effectively, they can promote the service by collaborating with more retailers such as supermarkets and electronic stores. If the take-back service has low relevance with the purchase platforms, users may feel exhausted searching for information, thereby giving up the return option. Therefore, a good connection between the purchase and take-back process adds to a positive return experience and increases users' ability to return.

Conclusion of findings in phase 2

This phase consists of the internal searching process and the external searching process. During the internal search that happens in one's memory, the ability to return is affected by one's existing personal knowledge and awareness or take-back programs. During the process of external search, the ability to return is influenced by how the company delivers the message, which includes factors such as information visibility and accessibility, and the alignment between return methods and purchase methods.

Overall, there are two reasons for the low ability to return in this searching phase. First, few Grooming take-back programs have been launched so far. Second, users are not well informed of the existing free-recycle service. As a result, they may choose other options such as storing the device at home and discard at garbage bins or e-waste collection points. In order to prevent people from throwing devices in normal waste bins and reduce their hoarding behaviours, it's meaningful to increase people's ability to return through Philips take-back programs hence increasing the possibility of more sustainable behaviours during EOU.

Phase 3: Evaluate EOU options

After searching for EOU options, a user starts to evaluate the divestment options generated in the last step. This stage results in the decisions of whether to keep the current product use cycle and which option should be taken to dispose of the product. This section analyses how relevant factors influence a user's evaluation process.

Factors that influence users' ability to return used devices through Philips's take-back service.

Knowledge and experience on (potential) return methods

Existing knowledge and experience with the service's return methods leads to a higher ability to return used devices.

Sending out a package and dropping things at collection points are two common and appropriate ways for users to return an item. If users have more experience with the process, it's easier for them to take action. While younger participants (25-40 years old) are familiar with sending packages through post service, older participants (>50 years old) have less experience with placing shipping orders online. Moreover, older participants feel more comfortable to take their waste to physical collection points. Therefore, an ideal take-back service needs to offer different return methods to match users' various preferences, thereby increasing the ability to return.

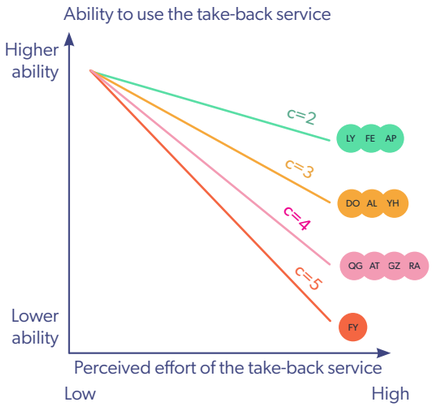
The perceived effort to use a take-back service and a user's desire for convenience

The ability to use the take-back service will be influenced by two factors: A user's perceived effort and the user's need for convenience
As shown in the Figure 2.35, a relationship can be drawn between three factors: ability to use take-back service, perceived effort of the service and desire for convenience. Overall, the stronger the need for convenience, the greater the impact of perceived effort on the ability to return. In the interviews, participants were asked to rate their desire for a service's convenience level on a scale of 1 to 5. As depicted in figure, the user's desire for convenience c is a coefficient of perceived effort. When c is close to 1 (i.e., when the user has no requirement for convenience at all) , the perceived effort has a minimal effect on the user. On the contrary, as c approaches 5 (i.e. convenience is extremely important to the user), the greater the perceived effort, the lower the ability to use the service.

"For me. it doesn't have to be super, super, super easy. Even there are some difficulties during that, but it shouldn't be too much. (By a participant whose c=2)"

"Convenience is the prerequisite for all other factors and incentives. (By a participant whose c=5)"

Furthermore, a user's desire for convenience and the perceived effort is further influenced by several sub-factors.



c: desire for convenience
c=1,2,3,4,5

c=1, convenience is not at all important to the user
c=2, convenience is slightly important to the user
c=3, convenience is moderately important to the user
c=4, convenience is very important to the user
c=5, convenience is extremly important to the user

Fig 2.35 The relationship between between three factors: participants' ability to use take-back service, their perceived effort of the service and their desire for convenience.

A user's desire for convenience is affected by laziness or busyness.

The lazier or busier the person is, the less time and effort they want to spend for a take-back service. Therefore, these people are more desired for a convenient service experience.

"I'm too lazy to get rid of it because in the Netherlands, you can't throw it directly and it's too much effort and doesn't make sense to collect the small devices and bring it to collection points. I have to go with the car."

"I'm usually very busy, you know, I don't have time collecting and sending it somewhere, unless someone comes to pick it up for me and that might be possible"

The perceived effort can be influenced by a user's previous product return experience

Different product return experiences can result in different perceptions of effort needed for a take-back service. Some participants had good experience with dropping the device at logistic service points, some had negative experience with various specific reasons. Likewise, the door-to-door pick-up service also has brought people different perceptions of convenience. Therefore, it's difficult to find a collection method that meets everyone's need for convenience. The take-back service should find a way to offer multiple options, thus maximally meeting their needs for convenience.

"I guess it would be logical and convenient to

have a collection point, as the same way to collect light bulbs and batteries in a supermarket."

"I would like a person, like from UPS or PostNL, to come and collect it for me."

The perceived effort is influenced by the frequency of using the potential return facilities

Post service and municipal or supermarket waste collection facilities were the possible facilities in participants' assumptions for returning used Grooming devices. Compared to the regular waste recycle which may happen a few times a week, it's less frequent for participants to use post service and the waste collection facilities. Therefore, if the take-back service contains the process above, most users may feel higher mental effort due to the unfamiliarity with the infrastructure, thereby having lower ability to take action.

Factors that influence users' motivation to return used devices

The perceived environmental value of the take-back service and a user's circular motive

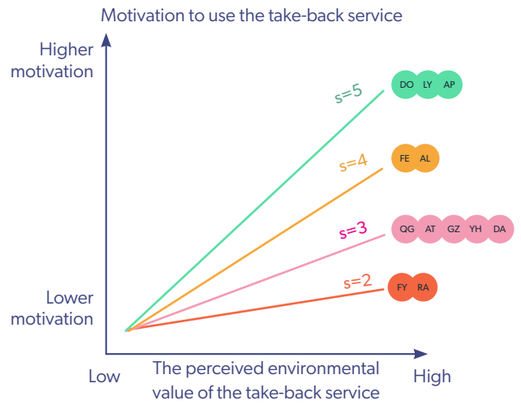
The motivation to use the take-back service will be influenced by two factors: the perceived environmental value of the service and a user's circular motive

As shown in Figure 2.36, a relationship can be drawn between three factors: motivation to use take-back service, the perceived environmental value of the service and a person's sustainability motive. The sustainability motive refers to a user's enthusiasm for protecting the environment. The perceived environmental value refers to how much benefit the user perceives that the service will bring to the environment.

Overall, the higher the sustainability motive, the greater the impact of perceived environmental value on the motivation to return. The user's sustainability motive s is a coefficient of the perceived environmental value. When s is close to 1 (i.e. the user is not interested in protecting the environment at all) , the perceived environmental value has a minimal effect on the user. On the contrary, as s approaches 5 (i.e. protecting the environment is extremely important to the user), the greater the perceived environmental value, the higher the motivation to use the take-back service.

"If it will break down eventually. And then it has gone through the environment, I think it will be really nice…So if the company would say, okay, we're gonna use most of the parts of this device, then it will be really nice. (By a participant whose s=4)"

"I think for now it has much more value for me to keep it, because I don't really trust our recycling industry at this moment. So it's worth more to me if I repair or try to use it than returning to somewhere to recycle. (By a participant whose s=5)"



s: sustainability motive
s=1,2,3,4,5

s=1, sustainability is not at all important to the user
s=2, sustainability is slightly important to the user
s=3, sustainability is moderately important to the user
s=4, sustainability is very important to the user
s=5, sustainability is extremely important to the user

Fig 2.36 The relationship between between three factors: participants' motivation to use take-back service, the perceived environmental value of the service and their sustainability motive.

Furthermore, the perceived environmental value of a take-back service and a user's circular motive can be further influenced by several sub-factors.

The distrust in Philips leads to little perceived environmental value of the take-back service

Some participants highly doubt the authenticity of companies' circular programs due to several greenwashing cases that happened before. The distrust could result in a low perceived environmental value of the take-back service. However, some participants trust municipal collection systems and recycling companies more than the commercial circular programs as they thought municipality and recyclers didn't have to raise their image through greenwashing.

"I just heard too many stories about it that plastics just end up with others in waste incineration plants, instead of getting recycled properly."

The environmental value is not tangible, which leads to low perceived environmental value for the take-back service.

First, users would perceive little environmental value if the company doesn't communicate the outcome. For instance, they would only feel the benefit for the environment when they know the old device is properly recycled or refurbished. Second, if the environmental value is communicated in an intangible way, it will lower the environmental value perceived by users.

"You don't really see these kinds of products from recycled materials. And if my shaver would end up in a new shaver, then a company would advertise that right? They will be proud that they're using recycled materials. (But you didn't see it.) So as long as I'm not seeing that, I don't really trust that the industry is there yet to do it."

A user's sustainability motive can be influenced by personal surroundings, social norms, and personal environmental awareness.

A user's sustainability motive can be influenced by three factors. The first one is the user's surroundings, such as the local community and one's working or studying environment. A user's sustainability motive may increase when the surroundings have a high motivation for protecting the environment. For instance, if the entire local community is advocating the participation of recycling programs, people in this community may have a stronger motivation to engage in circular programs.

"I recycle as much as I can in my neighbourhood actually. Because we have machines for recycling the plastic and everyone is doing that."

The second factor is social norms that generated by a broader society context. For example, regulations rewarding "good behaviours" and sanctioning "inappropriate behaviours"(Perry et al., 2021). A user may have higher sustainability motive when it is regarded as a shared standard in the society. The last factor is the environmental awareness, which can be formed over one's education and other previous experience. A user may have developed higher environmental awareness if the person has been taught relevant knowledge throughout the previous experience.

"I started to recycle stuff since I was a child, as there were rules about recycling. I was taught from an early age that it was wrong or even will be fined if I break the rules."

These factors all influence one's environmental responsibility and sustainability motive. Participants with strong sustainability motive would feel self-pressure, guilt and shame when behaving unsustainably, thereby promoting their long-term circular behaviours.

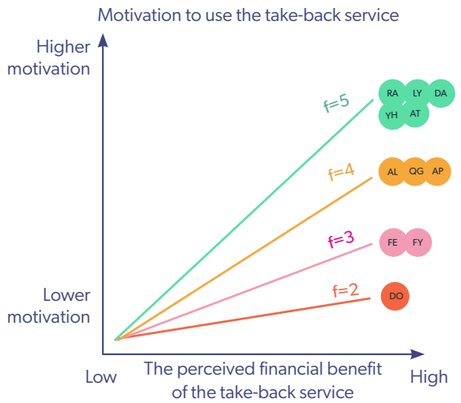
"I don't think others would judge me, but I can't forgive myself if I don't recycle properly."

The perceived financial benefit of the take-back program and a user's desire for financial rewards

The motivation to use the take-back service will be influenced by two factors: the perceived financial benefit of the service and a user's desire for financial rewards

As seen in the Figure 2.37, a relationship can be drawn between three factors: motivation to use take-back service, the perceived financial benefit of the service and a person's desire for financial rewards. The desire for financial rewards refers to how much monetary value users are expecting from the take-back service. In a Grooming take-back service, the financial benefit could be a discount-voucher, cash back, or other incentives that contain monetary value. The perceived financial benefit refers to how much value users feel they could get from the service.

According to the figure, the higher the desire for financial benefit, the higher the impact of perceived financial benefit on the motivation to use the take-back service. The user's desire for financial rewards f is a coefficient of the perceived



f: desire for financial rewards
f=1,2,3,4,5

f=1, financial benefit is not at all important to the user
f=2, financial benefit is slightly important to the user
f=3, financial benefit is moderately important to the user
f=4, financial benefit is very important to the user
f=5, financial benefit is extremely important to the user

Fig 2.37 The relationship between three factors: participants' motivation to use the take-back service, the perceived financial benefit of the service and their desire for financial rewards.

financial benefit. When f is close to 1 (i.e. the user is not interested in financial benefit , the perceived financial benefit has a minimal effect on the user. In contrast, as f approaches 5 (i.e. financial rewards are extremely important to the user), the greater the perceived financial benefit, the higher the motivation to use the take-back service. Moreover, the perceived financial value of a take-back service and a user's desire for financial rewards can be further influenced by several sub-factors.

A user's previous experience with other product return programs would influence the perceived financial benefits of a take-back service

When participants have experienced other take-back programs, they would assume the Grooming take-back process to be similar as the previous ones. In the interviews, participants were asked to make assumptions about the financial benefit offered by the Grooming take-back program based on their previous experience. As a result, participants made three types of assumptions, which are mapped in Figure 2.38 with their different levels of perceived financial benefit.

It contains cost / It's free of charge

Some participants assumed the Grooming take-back service would contain charge when collecting as they have experienced paying for the waste collection in other programs. Some assumed the service offered free collection service like the collection of used cartridges and old clothes. These two perceptions lead to no expectation for the financial benefit, which may lower people's motivation to learn about the take-back service. However, this might make the financial compensation more unexpectedly attractive when those users found that they can actually get monetary rewards instead of paying for the return.

It provides financial compensation

With some experience in the trade-in programs, some participants assume the Grooming return service would offer financial rewards in the form of discount vouchers for the next purchase at Philips, which increases one's expectation for the financial rewards. However, participants pay attention to different aspects when evaluating a smartphone trade-in program and a Grooming product trade-in program. Unlike smartphones, Grooming products are relatively cheap. When evaluating a smartphone trade-in program, people may expect more cash back by returning a used phone. But when considering a Grooming take-back program, participants were less

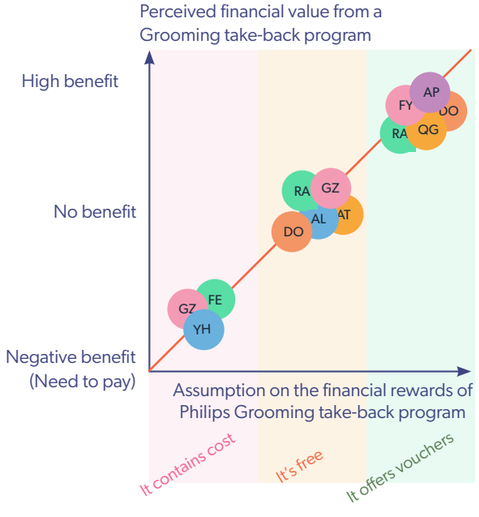


Fig 2.38 Mapping of participants' assumptions with their perceived financial benefit

concerned about the monetary value itself. Instead, they are more interested in what new products they can get with the discount. In other words, if Philips offers vouchers after the return, whether the user can perceive high value from vouchers largely depends on their need to upgrade and the range of choice for new products. If a user has no interest in buying new products, the discount voucher may be less attractive than other types of rewards.

A user's desire for financial rewards can be influenced by the financial resources and the personal attributes

Wealthy people may have less desire for the financial rewards offered in a Grooming service. Some people may even simplify the process by using money to save time. On the contrary, people with limited financial resources could have higher expectation for financial rewards or they are not interested in the rewards but at least unlikely to pay for the service. However, one's desire for financial compensation could also be intrinsically formed by the personal attributes regardless of the financial status. For instance, a wealthy person might also have strong expectation with the 15% discount provided by the Grooming take-back service.

Conclusion for findings in phase 3

In this evaluation phase, users will decide whether to keep the current product use cycle and then select a disposition option. During this process, a user's ability and motivation to use a take-back service are influenced by several factors. First, users who have experience with similar return processes would have a higher ability to use the return service. Second, users attribute different weight to the three factors: convenience, sustainability, and financial benefit. Therefore, they will be influenced to varying degrees by another three factors: the perceived effort, perceived environmental value, and perceived financial benefit. In other words, people who value convenience are likely to be influenced by perceived effort needed for a take-back program; People who are concerned with the environment are more likely to be affected by the perceived environmental value generated by the program; And people who value the financial rewards are more easily to be influenced by the perceived financial benefits from the program.

Phase 4: Take action

Followed by the evaluation of EOU options and the decision of ending the current use cycle, a user takes the final action of disposition, which results in a physical separation (Poppelaars et al., 2020). This section discusses how relevant factors might influence one's behaviour during the disposition of a Grooming device.

Divestment habit of dispensing with cheap products in one go

A delayed decision-making in the dilemma recognition phase may result in the accumulation of used devices. In the case a user might be triggered to declutter and dispense with cheap products together, which usually happens under a specific moment or event, such as when realising the drawer is full or when cleaning the house. During the decluttering, the financial compensation and the desire for convenience can be traded off. For instance, when perceiving great values remained in a used item (e.g., a functioning smartphone), the user may not mind spending extra effort to trade in and get a satisfying financial compensation. But when disposing of relatively cheap items (e.g., electric shavers), the user may simplify the divestment process as much as possible since little financial compensation is expected from the disposition.

"I think I am still doing that with the Fairphone returning (program). But for shavers… it should be possible to get rid of all those things in one go instead of having to go to five different companies and giving each of them one product."

Factor that influences a user's motivation to use the take-back service

Positive emotion after conducting a circular behaviour

Positive emotion after a circular divestment may lead to long-lasting return behaviour

Conducting a circular behaviour may create a sense of pride and satisfaction, which could be a motivator to maintain the user's circular behaviour. Therefore, if participating the take-back program can bring users a positive emotion for environmental contribution, users may have higher motivation to maintain a long-term return behaviour.

"I feel happy whenever I have recycled something. The more serious damages it can cause to the environment, the greater sense of contribution and satisfaction I would have."

Factors that influence a user's ability to use the take-back service

Usability of the take-back program

Usability of a take-back service refers to the degree of easiness of the service. As stated in Fogg behaviour model, when a person has low motivation to conduct a certain behaviour, an extremely high ability can also lead to that behaviour. According to the interviews, the usability of the take-back service is affected by two factors.

An easy-to-use infrastructure of the take-back service can increase the user's ability to return

Returning shavers during EOU and disposing of regular waste are two comparable behaviours in terms of the payback value. Regular waste disposition mainly creates environmental value and provides little direct value for the person. Likewise, returning a shaver may not bring high value to the user as well due to the relatively low price of Grooming products. Therefore, by studying people's regular waste disposition behaviour, it is possible to infer several factors that also influence their behaviour of using the take-back service.

Among all the participants, the two who had least sustainability motive still do the daily waste sorting. One reason is that they didn't want to break the local regulation. The other reason is that the waste collection infrastructures were easy to use as the places were next to the door, the bins were easy to open, and the signs were understandable. As a result, although the two participants were not recycling out of the strong environmental motive, the effortless infrastructure had promoted their recycling behaviour. Therefore, an easy-to-use take-back service may also increase a user's ability to return and reduce the negative effect of low motivation on behaviour, thereby leading to ideal behaviour of returning.

A take-back service that aligns with a user's other planned tasks or daily routine may create a higher ability to return

Several participants indicated that they prefer to recycle the waste on the way leaving instead of going out just for dropping off the waste. This indicates that people are not willing to put extra effort in something that provides low payback value. Instead, they prefer it to be done along with the routine or other more important tasks. Considering that some users may perceive low payback value from the Grooming take-back service, they may have less mental effort to return if the process can be combined with existing routine or other tasks.

The variety of return options can influence a user's ability to return

As discussed in phase 3, users' different return experiences can result in different preference of the return option. As it's difficult to find a option that meets everyone's needs, a take-back service with a variety of options can effectively increase users' ability to return.

"I prefer to drop it by myself, otherwise I need to wait at home for someone to pick up."

"I would like a person, like from UPS or PostNL, to come and collect it for me."

Conclusion for phase 4

In the last phase of the divestment journey, the user will take the final action to dispose of the Grooming device. First, a user's long-term motivation to use a take-back service can be promoted by their positive emotion after participating in a circular program. Second, a user's ability to return a device is closely connected with the usability of infrastructure. An easy-to-use service infrastructure, a return process that aligns with user's other tasks or routine, and a large variety of return options can all add to the usability of the take-back service. Furthermore, as some people are used to dispense with products together when decluttering old items, the take-back service can increase the user's ability by accepting multiple devices together, thereby meeting the need of simplifying the divestment process.

Conclusion of the in-depth interviews

This section deeply analyses the interview results. In conclusion, users will experience a four-stage decision making process during the EOU. Each stage has multiple influencing factors that affect one's motivation and ability to use Philips's take-back program. To better illustrate the relationship between each factors during the divestment journey, an overview of influencing factors were illustrated below.

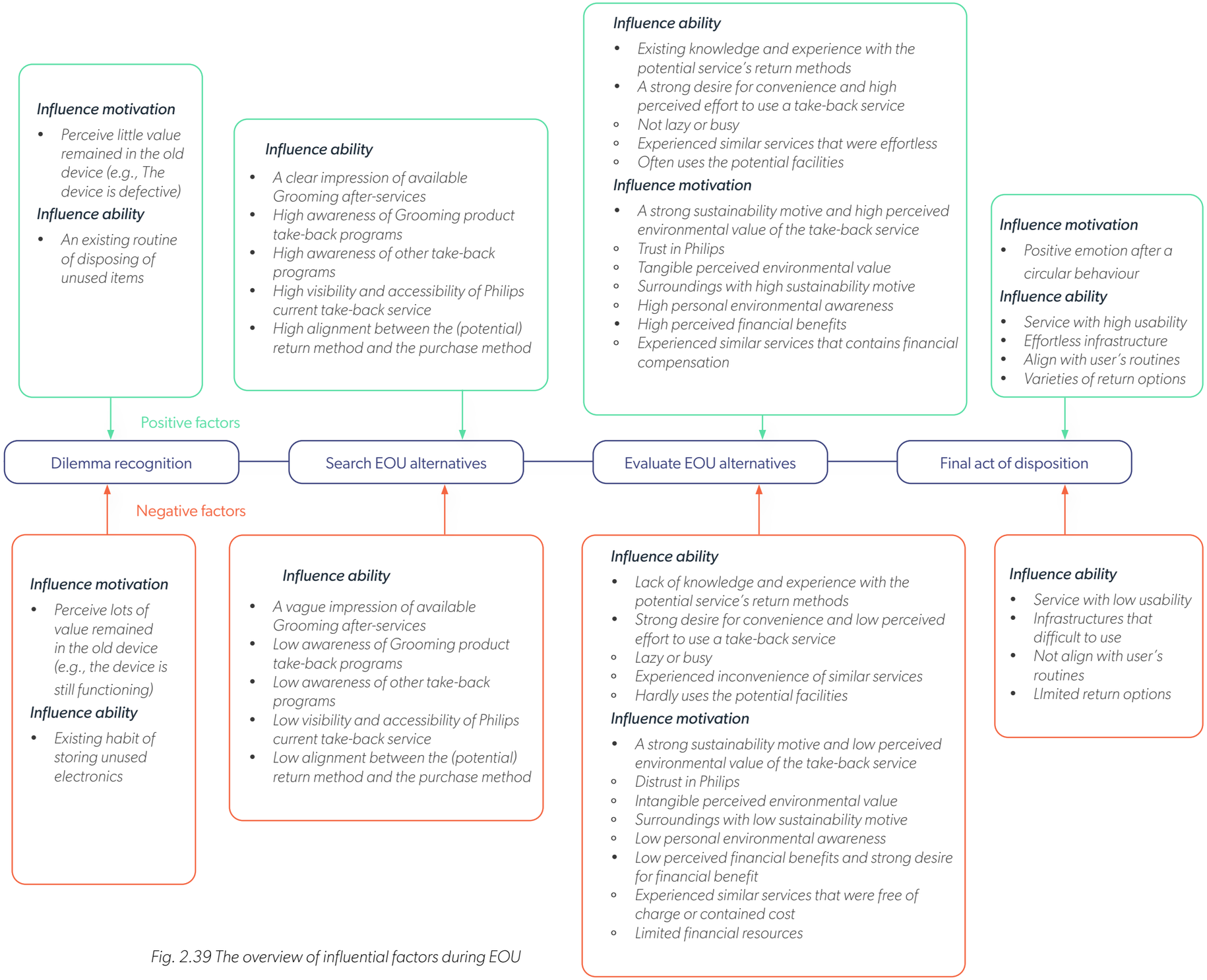


Fig. 2.39 The overview of influential factors during EOU

Conclusion of Chapter 2

A transition from a linear economy to a circular economy can minimize resource input, reduce waste, and balance the dilemma between industrial development and environmental issues. Driven by the sustainability goals, Philips tends to facilitate the circular economy by taking back used Grooming products from users by changing users' behaviour towards returning devices.

Fogg's behaviour model is taken as the major theory supporting the project research for Grooming consumers' behaviour. It proposes that motivation, ability, and prompts are the three main elements that decide one's behaviour. The three elements are used as the starting point for me to explore the effect of different factors on Grooming users' EOU behaviour.

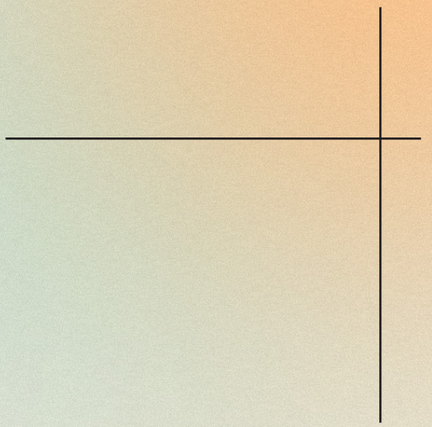
The benchmarking analysis shows different strategies that attract people to return the products. While providing financial benefits in the trade-in program and providing upgraded products in subscription service might increase people's motivation to return used products, several rebound effects will lead to unsustainable outcomes. These findings are valuable to be considered in the further development and reflection phase. Furthermore, the strategies can be used for validating with users in further in-depth interviews.

According to the service safari, Philips and its partners' existing services are not sufficient to meet users' EOU needs, which would result in difficulties for Philips to close the loop. Therefore, Philips could optimize the service by improving three aspects: the promotion, guidance at touchpoints, and infrastructure usability.

The analysis of the interviews draws an image of current user EOU behaviours. While users' motivation varies a lot among individuals, their ability for using the Grooming take-back service is rather low as they have little knowledge of it. In addition, the analysis explains what are the factors that influence users' and how they influence, which could be further formulated as design opportunities and design requirements for the concept development.

03
DEFINE

This chapter narrows down all the analysis results into integrated information and develops executive design decisions, which will be used as the starting point for the next design phase. First, the information synthesis section defines the personas and develops design opportunities. Second, a new design statement is given to define the design directions. At the end of this phase, design requirements are developed based on the selected design opportunities and previous analysis.



3.1 INFORMATION SYNTHESIS

In this section, the key findings from the context research, theory study as well as user research were integrated. First, personas were created to identify the shared attributes of different interest-groups. Second, an overview of design opportunities was created based on each influencing factor to demonstrate all the possible solution space, in order to provide sufficient input and inspirations for the further define and develop phases.

3.1.1 Persona

Personas are fictional profiles that represent a particular group based on their shared interests (Stickdorn et al., 2018). In this section, five personas were created from the interview data analysis to define the different interest-groups, which helped me identify the users' different needs that should be fulfilled in the final design.

Motivation-oriented personas

As discussed in the interview data analysis, users feel pain during divestment because they perceive a certain value remained in the product, which result in a dependency that makes them difficult to detach with it. A user's motivation to dispense with a product largely depends on whether the divestment option can make them painless by compensating for the loss of perceived remaining value.

When evaluating a take-back service, one's perceived remaining value can be offset by three types of values:(1) value for the environment, (2) financial benefit for the user, (3) the device's use-value for the user. Based on different weighting criteria among individuals, four different personas were created: *Circular enthusiasts, Profit seekers, Hibernators, Minimalists.* These four personas has illustrated one's attributes related to the motivation to return.

Ability-oriented persona

While users' motivation can be influenced by the values, whether they decide to use the take-back service also depends on their ability to do it. The last persona *Convenience seekers* was created based on one's intrinsic attribute that related to the ability to return.

Circular enthusiast

People of this group put environment as the priority in their value weighting system. They have strong sustainability motive, therefore their motivation to use a take-back service is largely influenced by their perceived environmental value created by that service. In other words, they care about how the service would contribute to the environment. Therefore, the greater the perceived environmental value, the more likely they will use the take-back service.

What are they doing with the old Grooming devices during the EOU?

Circular enthusiasts who want to keep the current use cycle: Trying to repair by themselves.
Circular enthusiasts who want to end the current use cycle: Keeping at home; dropping at waste collection points.

High motivation to use the take-back service when...

- *Perceives high environmental value*

i. *Trust in the company*
ii. *Tangible outcome for protecting the environment*

Low motivation to use the take-back service when...

- *Perceives low environmental value*

i. *Distrust in the company*
ii. *Intangible outcome for protecting the environment*

Profit seeker

This group of people are desired for the financial benefit for themselves. When evaluating a take-back service, the financial compensation from a take-back service comes as the highest priority. Therefore, they have higher motivation to use the service if they are satisfied with the financial rewards offered by the company.

What are they doing with the old Grooming devices during the EOU?

Profit seekers who want to keep the current use cycle: Keeping at home.

Profit seekers who want to end the current use cycle: Keeping at home; Trying to resell (this only happened to hair clipper users according to the interviews)

High motivation to use the take-back service when...

- *Positive previous experience on similar return service (e.g., trade-in programs that offer vouchers)*
- *Limited financial resources*

Low motivation to use the take-back service when...

- *Negative previous experience on similar return service (e.g., trade-in programs that offer vouchers)*
- *Sufficiant financial resources*

Hibernator

People from this group tend to attribute more use-value remained from the unnecessary device than others usually perceive. The use-value refers to the satisfaction that one obtains from the use of a commodity ("Value," 2014), which is different to the financial value. For instance, a 7-year-old functioning shaver may contain little financial value, but it remains lots of use-value as it can still remove one's hair properly. When evaluating a take-back program, the hibernators would have higher motivation only when they know the remaining use-value will not be wasted, for example, the device can still be used by others. Otherwise, they tend to keep the devices.

What are they doing with the old Grooming devices during the EOU?

Hibernators who want to keep the current use cycle: Keeping at home.

Hibernators who want to end the current use cycle: Keeping at home; Trying to resell or giving away for free (this only happened to hair clipper users according to the interviews).

High motivation to use the take-back service when…

- *Perceives less use-value left in the old device*
- *Believe the use-value can be retrieved in some other ways through the service*

Low motivation to use the take-back service when…

- *Perceives lots of use-value left in the old device*
- *Believe the use-value will be wasted by the service*

Minimalist

In contrast with hibernator, this group of people often perceive less remaining value for the unnecessary things. Minimalists like to keep a simple lifestyle, which leads to their high motivation to detach with products. As a result, whether they decide to use a take-back service largely depends on their ability to do it. When the service requires too much effort, minimalists tend to choose other effortless divestment options.

What are they doing with the old Grooming devices during the EOU?

Minimalists who want to end the current use cycle: Throwing at normal waste bins; Dropping at waste collection points; Trying to resell or giving away for free (this only happened to hair clipper users according to the interviews)

High ability to use the take-back service when…

- *The take-back service is easier to use than other divestment options*
- *Existing knowledge and experience with the potential service's return methods*
- *Pleasant previous experience with other return programs*
- *Familiar with the potential return facilities*
- *Service with high usability*
- *Effortless infrastructure*
- *Align with the user's routines*
- *Varieties of return options*

Low ablity to use the take-back service when…

- *Other divestment options are easier to use than the take-back service*
- *Lack of knowledge and experience with the potential service's return methods*
- *Negative previous experience with other return programs*
- *Unfamiliar with the potential return facilities*
- *Service with low usability*
- *Infrastructure that difficult to use*
- *Not align with the user's routines*
- *Limited return options*

Convenience seeker

While users' motivation can be influenced by the values, whether they decide to use the take-back service also depends on their ability to do it. The last persona convenience seeker was created based on one's intrinsic attribute that related to the ability to return. This group of people are likely to be busy or intrinsically lazy, which lead to their strong desire for the convenience. Convenience seekers tend to have higher ability to use a take-back service when they perceive little effort needed for the process.

High ability to use the take-back service when…

- *Existing knowledge and experience with the potential service's return methods*
- *Pleasant previous experience with other return programs*
- *Familiar with the potential return facilities*
- *Service with high usability*
- *Effortless infrastructure*
- *Align with the user's routines*
- *Varieties of return options*

Low ablity to use the take-back service when…

- *Lack of knowledge and experience with the potential service's return methods*
- *Negative previous experience with other return programs*
- *Unfamiliar with the potential return facilities*
- *Service with low usability*
- *Infrastructure that difficult to use*
- *Not align with the user's routines*
- *Limited return options*

Overall, theses personas aim to demonstrate what are the values influence one's motivation and ability when considering a Grooming take-back service. A real user is unlikely to be represented by a single persona, but rather of multiple personas with different proportions, which can lead to a comprehensive factor evaluation during their decision making.

For instance, when a user has primarily the "hibernator" attribute and with a bit "profit seeker" attribute, a take-back service with high-value monetary rewards might still be appealing to the user, hence reducing the concern of losing the use-value. Likewise, while a user who has low sustainability awareness is composed of the "minimalist" and the "convenience seeker", the person is likely to throw away the used shaver randomly as in the easiest way, which is not a sustainable outcome. But if a "minimalist" is also a "profit seeker", the user may prefer a take-back service with monetary rewards rather than throwing wastes everywhere. Therefore, it's important for the further design to take into account a user's multiple facets of personas.

3.1.2 Design opportunities

By synthesising the findings from benchmarking, service safari and interviews, a summary of design opportunities was developed. The design opportunities were created based on each influencing factor, aiming to provide directions and inspirations for designing interventions in the Develop phase. In order to represent the synthesis in consistent with previous findings and make the further design concept align with the findings, the overview of influencing factors, design opportunities and the targeted personas has been summarized based on the EOU journey that was earlier defined.

Selected directions

Because of the limited project time span, a decision needs to be made in order to find a focus for the project. As a result, the highlighted opportunities are selected as the design starting point. As this project is a product-service system design, the opportunities are selected for the entire service design but may not be completely elaborated into a detailed touchpoint design.

Through "Opportunity 1~3, 13, 16, 17", it is possible to motivate users to return by offering different values they need. "Opportunity 4~7" can trigger the users to start their divestment journey. "Opportunity 9~12, 18, 21~22" can reduce the barriers in the take-back service and increase users' ability to return. "Opportunity 15,19~20" aim to promote long-term user engagement in the take-back service.

"Opportunity 8" is excluded as the information needed for further design is difficult to retrieve from the retailers. Furthermore, as influencing a user's surroundings is challenging and contains too much uncertainty, "Opportunity 14" is left out for the project scope.

User journey	Factors	Sub factors	Description	Design opportunities		Description	Target at which persona?
1. Dilemma recognition	The condition of the old MG device		The condition of the old device largely affects users' perception of its remaining value. A user with a defective device may have stronger divestment motivation than the user with a functioning device does.	1	Design various incentives that compensate for the perceived values left in old devices	As users attribute values to the used products, a return service with incentives can be designed to balance different remaining values perceived by users so that users can be motivated to use this service.	hibernator, profit seeker
				2	Design interventions that reduce the remaining value perceived by users.	Apply interventions in the take-back service, which can lower the old device's residual value perceived by users. In other words, the intervention will make users feel they have gotten more value out of the used device and as a result, have higher motivation to return.	hibernator
				3	Communicate the loss of value if the device is stored at home and never used.	The loss of value refers to the value that the old device could have brought to the environment and to users through the take-back service. Meanwhile, Philips can emphasize that users would gain little value by storing the device at home and never using it.	
	Existing disposal habit		The existing disposal habit influences one's ability to make the divestment decision. It's easier for people to dispose of unused electronics when they have an existing routine to do it. In contrast, a habit of hoarding unused electronics tends to prevent them from divesting and may result in a delay of decision making.	4	Apply prompts that trigger decision making for divestment	Apply prompts at the right time to prevent the delay of action. The prompts could be sent out when people are about to face the EOU so they can be triggered to make decisions for divestment.	All
2. Search for EOU options	Personal knowledge on available services when facing EOU	Service promotion before the EOU	Users are not well informed about both commercial return service and recycling service during the purchase stage. As users may hardly visit the websites and stores after purchase, the lack of informing in purchase phase leads to them having a vague image of available MG after-services when facing EOU.	5	Promote the EOU service during the purchase phase	Philips can place an impression in users' mind by making them aware of the EOU services at the time of purchase. So that users are more likely to consider the services and search for it externally when finally facing the EOU stage.	All
		Awareness of take-back programs	When searching for EOU options for MG products, users would hardly look for a take-back service if they never heard about one. Therefore, it's more acceptable and less difficult to search for a MG take-back service when users have pre-knowledge about similar services.	6	Improve the service promotion to raise the awareness of potential users	Philips can actively promote the MG take-back service that reach out to more potential users. So that users would gradually realize that except for smartphone take-back services, MG products also provide take-back services.	All
		The ways of informing	The existing ways of informing are limited, which cannot well inform users as they acquire information through different channels.				
	The visibility and accessibility of the take-back service		The EOU services at multiple touchpoints that users interact with are difficult to find and access, which lead to low ability to start the divestment process. These touchpoints include product package, product user manual and Philips Webshop.	7	Embed the service information in more touchpoints and increase the visibility on internet to guide users through service in an intuitive and seamless way.	Philips can introduce the take-back service on most touchpoints that user might interact with during the EOU stage, including but not limited to product package, user manual, websites and physical retail stores. Philips can also increase the visibility of the service on internet (e.g., Google) to help users find the service easily.	All
	The guidance to support users to start a divestment process		Although the services are accessible, the existing interactive touchpoints offer little guidance for users to start the return journey, which lead to users' low ability to start the divestment process at Philips.				
	The alignment between the (potential) return method and the purchase method		If the return method closely connects with the original purchase process, users have higher ability to find the take-back service.	8	Enable users to find and access the take-back service at their original purchase platform.	As some users may subconsciously look for the EOU services at the original purchase platform, Philips can collaborate with retail stores to help users access the take-back service.	All

User journey	Factors	Sub factors	Description	Design opportunities		Description	Target at which persona?
3. Evaluate EOU options	Knowledge and experience on (potential) return methods		Users have different experience and preference for the return methods. They would have a higher ability to return the device in a familiar and preferred way.	9	Offer various and flexible return methods	Philips can offer different return methods to maximally match users' various preferences, thus maximally meeting their needs for convenience.	All, especially convenience seeker and minimalist
	The perceived effort to use a take-back service	The familarity with the potential return facilities	Users may not frequently use the potential return facilities such as post service and waste collection facilities, which creates high mental effort due to the unfamiliarity with the infrastructure.	10	Provide users with guidance and support throughout the entire service process	As it's difficult to change one's usage frequency of a certain facility, Philips could offer more seamless guidance and support during the user journey to increase users' confidence to use the service.	Convenience seeker and minimalist
				11	Incorporate the return process into the facilities that users familiar with.	Philips incorporate the take-back service process in to the existing infrastructure that users frequently use, which can give users confidence to use the service.	Convenience seeker and minimalist
		A user's previous product return experience	Users' previous product return experiences result in different perceptions of the effort needed for a take-back service, thereby leading to various preference of the return methods	12	Communicate the convenience of the take-back service during service promotion.	As users are not familiar with the MG take-back service, they may perceive it requires lots of effort based on their negative experience with other similar services. Therefore, Philips's take-back service can communicate the ease-of-use and reduce the effect of a user's previous negative experience on their ability to use Philips's take-back service.	Convenience seeker and minimalist
	A user's desire for convenience	laziness or busyness	The lazier or busier the user is, the less time and effort they want to spend for a take-back service, which means they have stronger needs for the convenience of a take-back service.				
	The perceived environmental value of the take-back service	Distrust in Philips	Some users doubt the authenticity of companies' circular programs due to several previous greenwashing incidents. The distrust could result in a low perceived environmental value of the take-back service.	13	Communicate the environmental value in a tangible manner and show the backstage process in a transparent way	Philips could demonstrate the backstage process, e.g., recycling, refurbishing and remanufacturing process, in a clear way. This may increase users' trust in the take-back service, thereby enhancing the perceived environmental value.	Circular enthusiast
		The tangibility of environmental value	Users would perceive little environmental value if the company doesn't communicate the outcome. Second, if the environmental value is communicated in an intangible way, it will lower the environmental value perceived by users.				
	A user's sustainability motive	Personal surroundings and social norms	A user's sustainability motive may increase when the surroundings have a high motivation for protecting the environment, and when the sustainable behaviour is regarded as a shared standard in the surroundings or in the society.	14	Create an environment that can increase users' sustainability motive	Philips could create and involve users into a small community where people have high sustainability motive. This may influence a user's individual sustainability motive, thereby increasing the likelihood of consumer using the take-back service.	Non-circular-enthusiast
		personal environmental awareness	A user may have developed higher environmental awareness if the person has been taught relevant knowledge throughout the previous experience.	15	Educate users on the environmental impact of the take-back service	Philips could raise users' sustainability awareness by explaining the process of the take-back service and educating them on the impact generated by the service. However, preaching may also be a backfire for some people who are unlikely to be influenced by sustainable arguments. Therefore, the communication should take into account the tone of voice that can bring users a comfortable experience when learning about sustainability.	Non-circular-enthusiast
	The perceived financial benefit of the take-back program	A user's previous experience with other product return programs	When assuming the MG take-back service contains charge or free of charge, a user may not expect for the financial benefit, which reduce the motivation to learn about the take-back service. On the contrary, assuming the MG return service offers financial rewards increases one's expectation for the financial rewards.	16	Clear communication of the financial benefit during the service promotion	If the take-back service does not clearly explain the financial benefits during the promotion, some users may still perceive it contains charge based on their previous experience, thereby not willing to return at Philips. Therefore, if the financial benefit is clearly communicated, it can reduce the effect of a user's previous negative experience on the motivation to use Philips's take-back service.	Profit seeker
	A user's desire for financial rewards	The user's personal attributes and the financial resources	Wealthy users may have less desire for the financial rewards offered in a MG service, while users with limited financial resources may have higher desire for the compensation. However, the desire could also be intrinsically formed by the personal attributes regardless of the financial status.	17	Provide trade-in vouchers that can be used on as many types of products as possible	If Philips's take-back program offers trade-in vouchers, users would be interested in what types of new products they can purchase with the vouchers. A large range of choice for new products can increase user's perceived value for the take-back service.	Profit seeker

User journey	Factors	Sub factors	Description	Design opportunities		Description	Target at which persona?
4. Take action	Divestment habit of dispensing with cheap products in one go		A delayed decision-making in the dilemma recognition phase may result in the accumulation of used devices. In the case a user might be triggered to declutter and dispense with cheap products together.	18	Maximize the types and numbers of used MG devices that can be accepted	To make sure as many types of MG devices as possible can be accepted so that people can dispose of the old products together, thereby having higher ability to return the devices.	All
	Positive emotion after conducting a circular behaviour		Conducting a circular behaviour may create a sense of pride and satisfaction, which could be a motivator to maintain the user's circular behaviour.	19	Intensify users' positive feeling after returning the device	Intensify users' positive feeling after returning the device The take-back service could increase the users' positive feelings by acknowledging the contribution to environment of their returns. This can promote users' long-term participation in the take-back program.	Circular enthusiasts
	Negative emotion after conducting unsustainable behaviour	A user's sustainability motive	A user with strong sustainability motive would feel self-pressure and guilty when behaving unsustainably, which can promoting their long-term circular behaviours.	20	Bring users a negative feeling if they keep the device at home but never using it.	The take-back service can emphasize the value that the old device could have brought to the environment, but it fails to bring due the user's hoarding behaviour.	Circular enthusiasts
	Usability of the take-back program	An effortless infrastructure	An easy-to-use take-back service can increase a user's ability to return and reduce the negative effect of low motivation on behaviour. The infrastructure may include Philips Webshop or retailers' websites, online or physical customer service, logistics services, physical collection facilities and other potential infrastructure.	21	Create effortless return experience at the service touchpoints	Each step of the service needs to be easy-to-use in order to reduce users' mental and physical effort during returning.	All, especially convenience seeker and minimalists
		The alignment of return process with tye user's other tasks or daily routine	Users may have less mental effort to return if the process can be combined with their existing routine or other tasks	22	Incorporate the return process into users' routines or other tasks	The take-back service could find a way to lower a user's effort by combining the return process in their existing routines.	All, especially convenience seeker and minimalists
		The variety of return options can influence a user's ability to return	users' different return experiences result in different preference of the return option. Therefore, a take-back service with a variety of options can effectively increase users' ability to return		Same as opportunity 9		

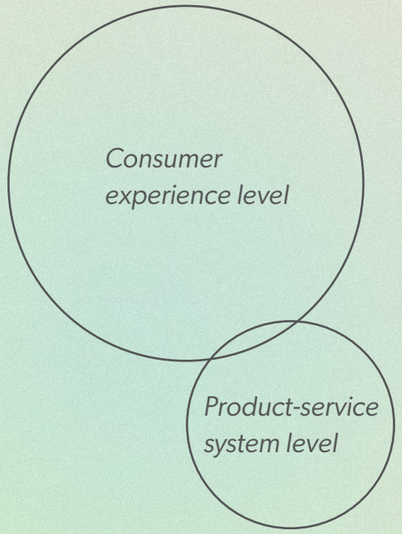
3.2 DESIGN STATEMENT

The objective of the design statement is to have a clear starting point for the next development phase. Based on the research phase, the main problem is:

Grooming users who tend to end the product use cycle are not motivated to return through Philip's existing EOU service, because Philips is not providing them with seamless and painless experience to divest, which result in users not divesting or choosing other divestment options.

This leads to several sub problems that have been discussed in the previous sections, such as users' low awareness of Philips Grooming take-back service due to the low visibility and limited promotion of the service, user's barriers in return due to the low accessibility and lack of guidance throughout the service process, and users' mental pain the take-back service cannot provide satisfying incentives that gives users different values they need.

Therefore, a new design statement is formulated. This design statement includes two small design goals that consider the design from the consumer experience level and product-service system level. However, due to the limited time duration, *this project would focus more on the consumer experience level during design iterations, while providing discussion and reflection on the product-system level for the final concept.*



Consumer experience level:

Developing a take-back service that can motivate consumers to return Grooming devices to Philips when they end the product use cycle, to offer a seamless and painless divestment experience by meeting the different values that each individual needs.

Product-service system level:

Developing a Grooming product take-back service that creates financial value and brand value on the long-term to both Philips and the stakeholders, as well as ensuring the value for the environment.

3.3 DESIGN REQUIREMENT

This section presents a set of design requirements that are based on the selected design opportunities and the data analysis from section 2.3.4. The requirements will be used for the further idea selection and concept evaluation. As some requirements can be applied for multiple phases in the user's divestment journey, it is more structured to organize the requirements based on different phases of a service.

Phase 1: inform and attract

- The time to send users prompts should be close to users' EOU phase. Moreover, the prompts should be based on the premise that users have enough motivation and ability to participate in the take-back service.
- The concept should avoid the backfire effects when trying to change users' perception of an old device's remaining value. For instance, if users perceive obvious marketing strategies to change their mind, they may have a negative impression on the brand image.
- The design concept should inform users about EOU services during users' purchase stage.
- In order inform the users effectively, the service promotion channels should be customized for different user groups based on the ways they acquire information.
- The premise of communicating the service's convenience is that the service needs to be really convenient, otherwise it may amplify the user's distrust with Philips.
- The concept should communicate the financial benefit in a clear way during the service promotion
- The concept should communicate the environmental value in a tangible manner and show the backstage process in a transparent way.
- When educating users on the service's environmental impact, the tone of voice should not be preachy, aggressive, and overwhelming.

Phase 2: guide and support

- The concept should provide high usability at each service touchpoint throughout the return journey. The touchpoints include but are not limited to Philips Webshop or retailers' websites, online or physical customer service, logistics services, physical collection facilities and other potential infrastructure.
- The service introduction embedded in each touchpoint should clearly guide and support the user to start the take-back service by, for instance, providing IOT service that leads them from the paper manual to a website, clarifying the return condition and listing the contact for customer service. Moreover, the service should be easily found on the internet for the users who are actively searching.
- The concept should support and assist users when using the return infrastructure.
- The concept should provide users with multiple return options, thus maximally meeting their needs for convenience.
- The return method should align with users' previous experience as closely as possible to reduce users' concerns and fear to use the service.

Conclusion of Chapter 3

On the one hand, a user's motivation to dispense with a product largely depends on whether the divestment option can compensate for the perceived value-loss. On the other hand, the user's ability depends on the intrinsic attribute (e.g., laziness). Based on different individuals' intrinsic personalities and the weighting of various values, five personas are created to identify the user groups.

Followed by personas, a set of design opportunities is created based on each influencing factor to demonstrate all the possible solution space. 20 opportunities are selected as the direction for ideation.

Futher, a new design statement with two levels is formulated. And the project would focus more on the consumer experience level during design iterations, while providing discussion and reflection on the product-system level for the final concept.

Finally, design requirements are developed based on the selected design opportunities and previous analysis, which will be used for design development and evaluation.

04
DEVELOP

Followed by the design opportunities, design statement, and design requirements, this chapter presents two design iterations that demonstrate the design development from the preliminary concept to the final design.

The first iteration starts from ideating on the design opportunities. Afterwards, a preliminary concept is created and followed by an evaluation with the supervisory team and professionals.

The evaluation leads to the concept adjustment and results in an intermediary concept in the second iteration. Based on the user feedback and supervisory team feedback, the third design iteration is developed as the final delivery.

4.1 IDEATION

4.1.1 Ideation

After the design challenges and opportunities are defined, it's time to have an open mind to generate ideas for the solutions. Therefore, ideation sessions are set as the first step of the design development.

Ideation sessions

The ideation consists of a co-creation session and several self-ideation sessions, which were implemented based on the same process. These brainstorming sessions aim to explore as many ideas as possible and focus on the quantity rather than quality.

List of "How to" questions

Before all the sessions start, a set of "How to" questions were developed from the pain points of personas and from the negative influencing factors throughout the divestment user journey (Figure 4.1). By defining these questions, participants could have a clear direction to brainstorm on, and a problem can be explored in different angles. Therefore, the following five challenges and the sub questions were formulated.

Challenge 1: To motivate the 'hibernator' to use the take-back service.

- How to trigger their spontaneous desire to declutter?
- How to meet their need of 'disposing as many as electronics together'?
- How to compensate their perceived use-value remained in the product?
- How to reduce their perceived use-value remained in the product?

Challenge 2: To motivate the 'circular enthusiasts' to use the take-back service.

- How to increase their trust in Philips's take-back service?
- How to increase the transparency of the process after return?
- How to communicate the environmental value to them in a tangible way?

Challenge 3: To motivate the 'profit seeker' to use the take-back service.

- *How to increase their perceived financial value?*

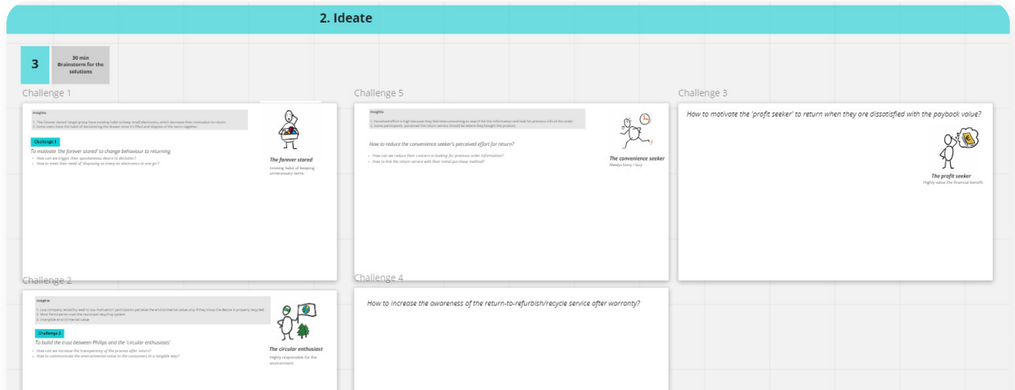
Challenge 4: To increase the convenience seeker's ability to use the take-back service.

- How to increase the variety of return options?
- How to align the service with the user's routines or other tasks?
- How to enhance the service's usability and make it effortless?

Challenge 5: To increase users' awareness of the take-back service.

- How to increase users' awareness on the take-back service?

Fig 4.1 A set of "How to" questions were developed from the pain points of personas and from the negative influencing factors



The behaviour change intervention toolbox

In order to inspire and stimulate participants to produce more ideas, a behaviour change intervention toolbox was used for the co-creation session (Figure 4.2). This toolbox contained different interventions for changing consumer behaviours towards a more sustainable way. These interventions were from studies that I learned in the early literature review phase (Okada, 2001; Ölander & Thøgersen, 2014; Poppelaars et al., 2020; Verplanken, 2018; White et al., 2019). By checking the intervention toolbox during brainstorming, the participants could be inspired and were likely to generate more high-quality ideas.

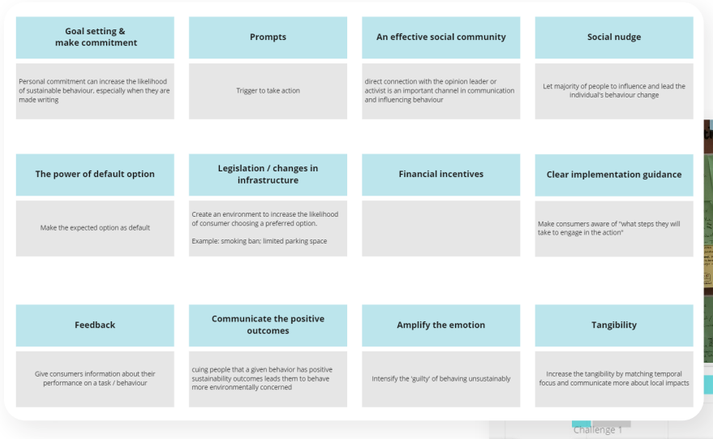


Fig 4.2 Behaviour change intervention toolbox was created for inspiring and stimulating the participants in co-creation session

Fig 4.4 Self-ideation sessions

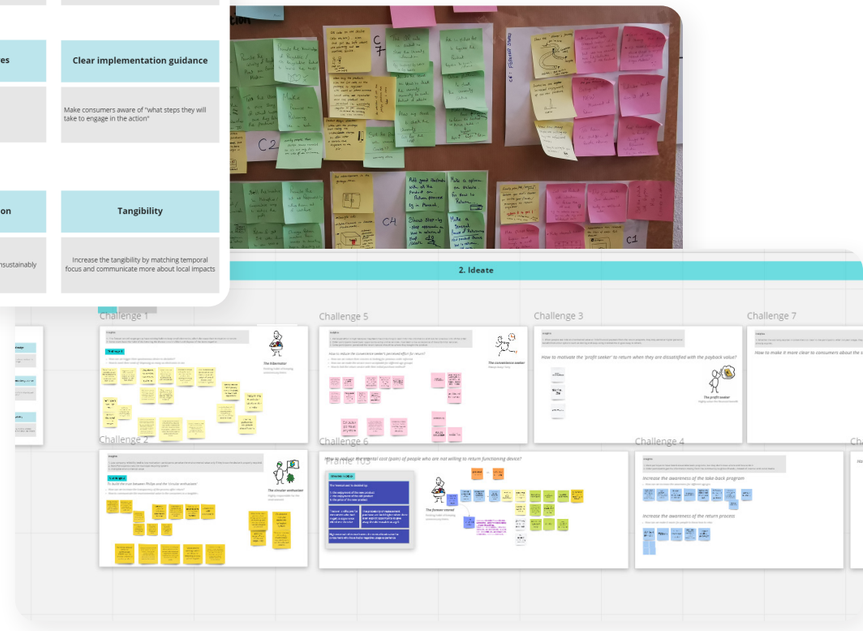


Fig 4.3 Co-creation session conducted on Miro

Co-creation session and self-ideation sessions

The participants of the co-creation session were composed of four designers from Philips, one design master student from TU Delft, and me as a facilitator. The brainstorming started with the introduction of project backgrounds, personas, project design goal and the challenges ideate on (Figure 4.3). Then each participant was asked to work on a "How to" question for three minutes and then briefly explain the ideas to other people. After the co-creation session, I conducted several self-ideation sessions in order to produce more ideas for the "How to" questions. (Figure 4.4)

4.1.2 Idea clustering and selection

After the ideation sessions, similar ideas were clustered (Fig 4.5), and the challenges were organized based on the user divestment process. This is to get a structured overview of all ideas generated in the sessions, which can add to the efficiency of further concept development process. Further, I conducted an idea selection (Fig 4.6) based on a two-dimensional axis that determined by the effort needed by Philips and the impact on one's motivation or ability (Figure 4.7). As a result, ideas were picked and combined as a preliminary service concept.

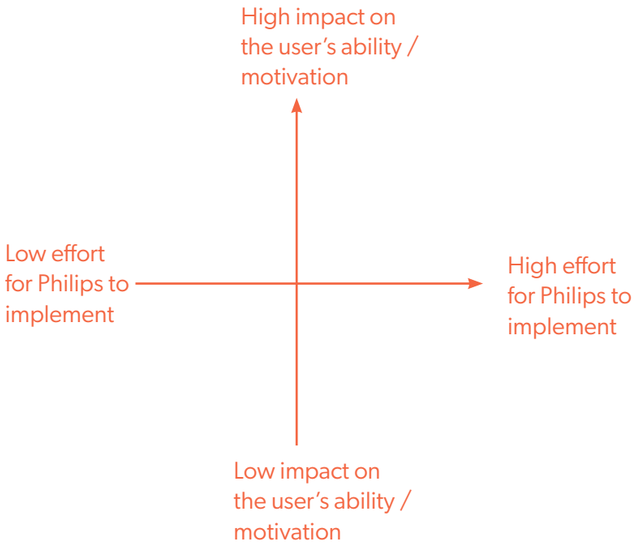


Fig 4.7 The two-dimensional axis for idea selection

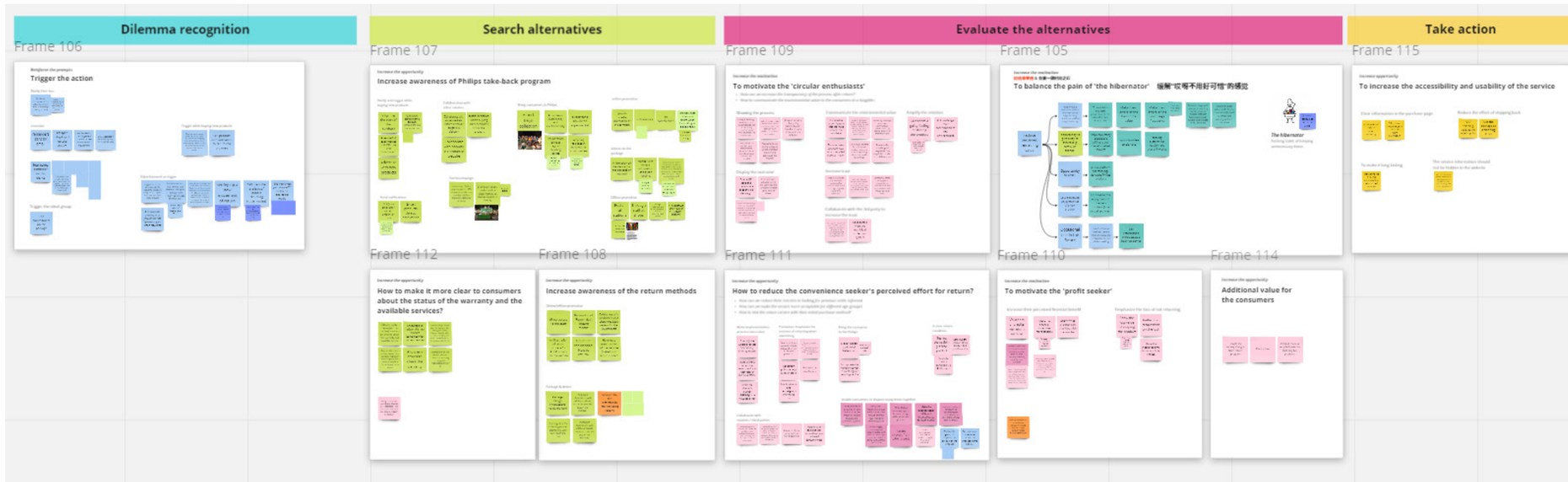


Fig 4.5 Idea clustering

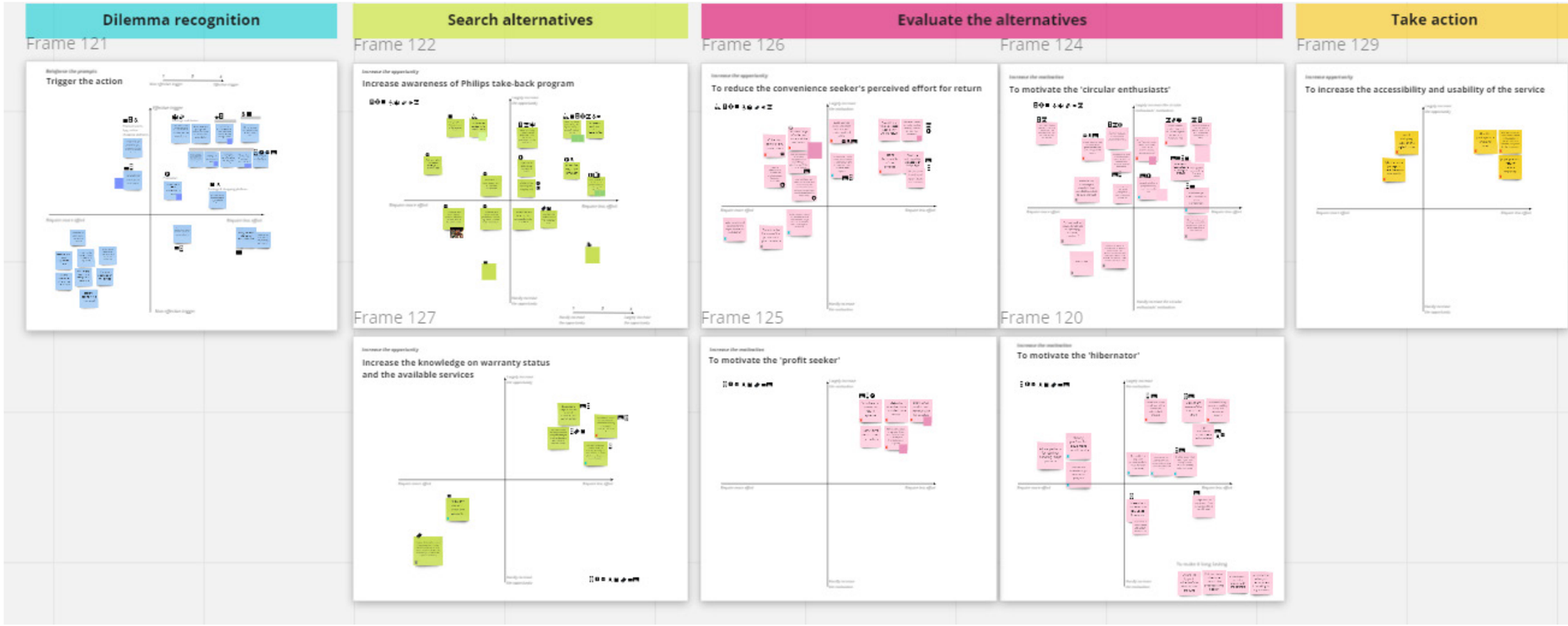


Fig 4.6 Idea selection

4.2 DESIGN ITERATION #1

As a result of the ideation sessions, I conducted the first design iteration. This iteration aims to formulate a preliminary service concept, which could be validated with the supervisory team and professionals to make sure the concept is on the right track and align with the research findings.

4.2.1 Preliminary concept

The concept consists of three service stages:
(1) Inform and attract;
(2) Guide and support;
(3) Collect and process.
It starts with promoting the service in various channels to raise the user awareness. Users who are interested in the service will be guided to a landing page that is embedded in the Philips online shopping website to learn more information. Afterwards, the user can follow the instructions to return used devices through three different ways and receive financial compensation. Finally, the returned devices are further collected by third parties to refurbish or recycle, and start the journey of their second lives.

The concept aims to use a variety of design interventions to motivate targeted persona to return. These interventions are incorporated in the entire design process in various forms such as the design of promotion method, the design for ways of communication, and the design for return methods. The details of each service stage are described below.

Stage 1: Inform and attract.

The first stage aims to raise user's awareness about the take-back service and increase the likelihood for them to consider this service during the early "search for EOU options" phase.

Flash campaign --- Philips Grooming Take-back Week

In order to effectively inform users, the idea is to launch the take-back service during the events when people are proactively shopping, such as Black Friday and Christmas holiday (Figure 4.7). As people are actively shopping at stores or browsing the websites, promoting the take-back service during this time can increase the service exposure more effectively. Besides, this booster week concept is similar to the flash sales that are booming in the markets today. Flash sales can make consumers feel the product is unique and unmissable, hence affecting consumers' purchase decisions (Mathen & Abhishek, 2014). Likewise, the take-back booster week may serve as a prompt to stimulate consumers to act fast and return now to get an "unmissable" trade-in discount within a limited time.

Fig. 4.7 Flash campaign

Stage 2: Guide and support

Once users are getting interested in the take-back service, Philips should provide them with seamless guidance and support to start the return process. Apart from the guidance provided by the retail store employees, the website landing page is an important touchpoint that allows users to easily access the service. Therefore, the landing page is selected as the touchpoint for elaboration.

"Philips Grooming Take-back Week" landing page on Philips Webship

The preliminary design of landing page focuses on the content and communication that could motivate targeted personas. Each section is explained below in detail.

Introducing the sustainability goal of the take-back service

It starts with introducing the sustainability goal of this service (Figure 4.8), which aims to state Philips's circular vision to all the audience, especially circular enthusiasts, that protecting environment is the main driver of this service. This can establish Philips' sustainable brand image and ensure that Philips' vision is clear communicated to users.

Showing the number of people who are willing to buy refurbished Grooming products

According to the research insight, hibernators would have higher motivation to detach with used products only when they know the remaining product use-value will not be wasted. The concept displays the number of people who want to buy refurbished Grooming products (Figure 4.8). It aims to attract hibernators by communicating that their returns will create further use-value for other people.

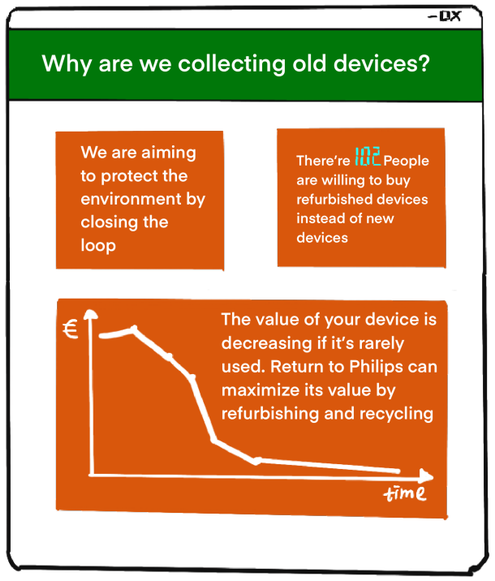


Fig. 4.8 Introducing sustainability goal; showing the demand of refurbished products; Making users aware the loss of trade-in value

Making users aware of the loss of trade-in value over time

This section uses a table to display the decreased trade-in value over time (Figure 4.8). It aims to motivate the profit seekers to return by communicating the loss of financial value as their old products are kept at home.

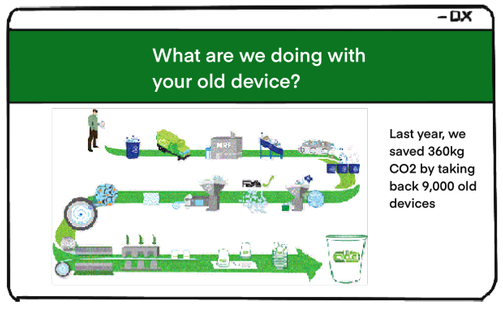


Fig. 4.9 Overview of service flow

Showing an overview of service flow in a tangible way

A visualisation of the entire service flow is shown in this section (Figure 4.9). This aims to explain the backend actions that happen to the returned devices, thereby communicating the service reliability and increasing circular enthusiasts' motivation to use the service.

A gift card for each returned device and a chance to win a bigger prize

After returning the device, the user will get a trade-in discount for the next purchase. The user would also get a chance to win a larger amount of financial rewards, which targets at some profit seekers who are unsatisfied with the discount value (Figure 4.10).

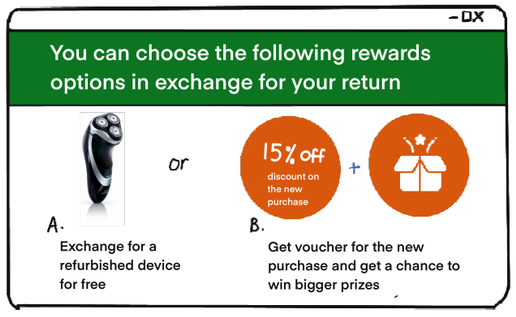


Fig. 4.10 Financial Incentives

Group return: return with family and friends and get more benefit

To attract the profit-seekers, the concept adopts a friend invitation promotion scheme to encourage users to return devices with others and gain larger trade-in value (Figure 4.11).

Fig. 4.11 Group return scheme

Device condition checking

In this concept, the value of a trade-in gift card is based on the condition of the device. Before making the decision, the user can check the device condition by filling in some detail information and seeing how much trade-in value could be offered (Figure 4.12).

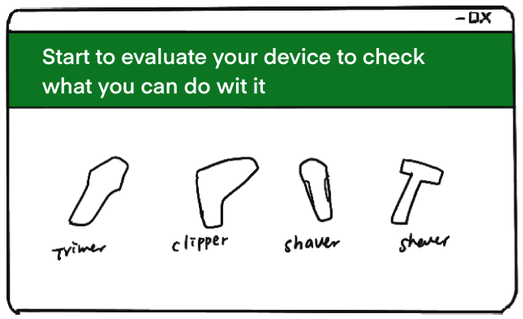


Fig. 4.12 Device condition checking

Handing in the device through three different ways (Figure 4.13)

Returning through logistics companies

The user can request a pre-paid shipping label on the website for free and then send out the device through Philips's partner logistic company.

Dropping at collection points located at multiple places in the city

Philips can set up several collection infrastructures in the city, such as incorporating the collection machine with the municipal waste collection infrastructure or placing the machine at grocery stores. This could allow users to easily drop off devices at different locations.

Handing in the device at Philips's partner retail stores

As retail stores will be an important promotion channel during the flash campaign, it makes the return method more logical by setting up collection points in the stores. During the events, users could get gift cards after returning devices at retailers, which may bring retailers more profit if the gift cards are redeemed at stores.

Stage 3: After collection

The returned devices will be picked up by logistic partners from each collection point and transported to the third-party plant to refurbish and recycle. Afterwards, users will be informed with the processing outcome of their used device. This aims to build trust with users and to stimulate their positive feeling for contributing to the environment.

Fig. 4.13 Three ways of returning

4.2.2 Evaluation of the preliminary concept

After transforming the individual ideas into an integrated preliminary concept, several evaluation sessions were conducted to assess whether the concept directions were logical and whether it aligned with the design goal.

As the preliminary concept focuses on defining the design direction, users are not involved in the evaluation sessions. The participants were comprised of the supervisory team and five Philips professionals. During the evaluation sessions, I presented the service flow and the prototypes of website landing page. After discussing each element of the concept, some key takeaways are summarised below.

Key takeaways from the evaluation sessions

The concept needs to consider the timing to inform people.

If users just bought a full price shaver and Philips says "you could have gotten 50% off with this trade-in schemes, they may get disappointed.
(Feedback from the supervisory team and Philips product researcher)

The promotion campaign needs to reconsider the launching strategy.

If users need to wait till another year to return, their motivation to return may largely decrease.
(Feedback from the supervisory team)

The service can be promoted on more holidays and events instead of only Black Friday.

As users are likely to be extremely busy with all the advertisements during Black Friday, it would be hard to make Philips's promotions stand out. In order to increase the promotion efficiency, the service can also be launched during more events such as green week, electronics week, sustainable Saturday or other events throughout the year that could be linked to.
(Feedback from the Philips product researcher and the service designer)

The return process should make users perceive the value of the return.

Dropping off the device at waste collection places seems unable to make users perceive the value of the old device. Instead, users may feel like they are throwing general waste. It is better to give users a feeling that they are creating a second life for the shaver by giving it a chance for refurbishing or recycling.
(Feedback from the supervisory team)

The return process needs to be elaborated in a more detailed level.

The concept should elaborate more on how the device should be packed, which stakeholders are involved, and how it will be different based on the needs of different personas. These details would significantly affect the user return experience.
(Feedback from the supervisory team)

The concept needs to specify the types of products acceptable and the types of products able to be covered by gift cards.

(Feedback from the supervisory team)

Philips could gain more profit by taking back Grooming products regardless of brands, which might convert consumers from other brands to Philips's. (Feedback from the Philips product researcher) However, all the devices from other brands will be scrapped and recycled in the end as Philips could not refurbish them.
(Feedback from Philips repair and refurbish manager)

The concept can provide more trade-in discounts for purchasing a refurbished product to promote the sale of refurbished devices and build consumer trust. However, so far Philips don't have enough stock of refurbished products to make a large-scale campaign like this.
(Feedback from the Philips product researcher)

It is possible in the future to provide trade-in gift cards that can be redeemed for more types of Philips Personal Health products instead of only Grooming products. It's also more logical and convenient for consumers to bring back all different types of Philips devices in the long run. (Feedback from the Philips product researcher) Moreover, it is technically viable to refurbish or recycle all the Personal Health products together as it is related to the way that products are designed and composed.
(Feedback from Philips repair and refurbish manager)

It is not possible to show the percentage of recycled materials in each new product.

It's possible to combine components by part harvesting, but not possible to display the percentage of recycled materials in each new product because recycling and reusing internally is not practical in Philips today. However, the brand image will be much stronger in the long term if Philips can be internally circular.
(Feedback from Philips repair and refurbish manager)

It is not realistic to refurbish shaver used for several years.

So far, Grooming devices can hardly be refurbished mainly due to Philips's cosmetical and hygienic acceptance criteria. Therefore, the products that can be refurbished mainly come from commercial returns (i.e. returns within 30 days after purchase), instead of the ones used for several years. This is because the very old products usually could not meet the refurbishing requirements, and Philips does not have spare parts for old products.
(Feedback from Philips repair and refurbish manager)

Conclusion

The first design iteration leads to directions for the improvements in the next iteration. Overall, the second iteration would focus on the improvement of three aspects.

The launching strategy

- Refine the service scheme 'flash campaign'.
- Reconsider the timing of informing people about the service.
- Define the acceptable product types and the scheme for gift cards redemption.

The return process

- Make users perceive more value of returns.
- Elaborate the process at a more detailed level.

The backstage process

- Refine the concept elements based on the technical feasibility

4.3 DESIGN ITERATION 2

Following the directions for improvement, I conducted the second iteration. The purpose of this iteration is to demonstrate the concept more concretely and can be used for user evaluation. It starts with individual ideation on the return process. Afterwards, the service launching strategies and the backstage process are refined and prototyped. Finally, an intermediary concept is developed and evaluated with users and improvement directions are formulated for developing the final design.

4.3.1 Defining the return process

Design requirements for the return process

As a starting point to develop the return process, several design requirements can be formulated based on the preliminary concept evaluation. After combining with the design requirements developed in the previous Define stage, a list of design requirements for the return process is formed as below.

- The user should perceive the value of the return, which should be different from throwing general waste.
- The concept should be user-friendly throughout the return process.
- The concept should support and assist users when using the return infrastructure.
- The concept should provide users with multiple return options, thus maximally meeting their needs for convenience.
- The return method should align with users' previous experience as closely as possible to reduce users' concerns and fear to use the service.

Ideation on the return process

Based on the requirements, an individual ideation session is conducted for the return process. The ideation aims to explore solutions for four challenges that concluded from the preliminary concept evaluation and earlier user research insights.

- Challenge 1: How to make users feel the value of second life?
- Challenge 2: How will the device be packed up?
- Challenge 3: How to make it easier to print the shipping labels?
- Challenge 4: What return methods can be used for convenience seekers?

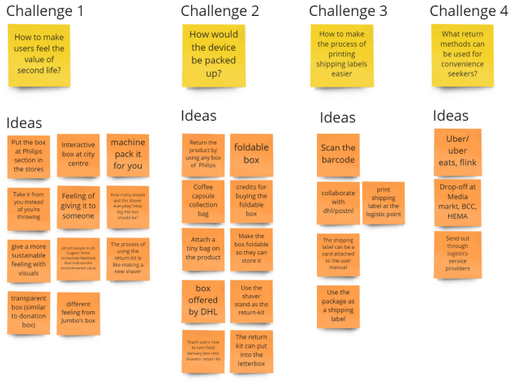


Fig. 4.14 Ideation on the return process

Benchmarking on the return kit

When ideating on 'Challenge 2: How will the device be packed up?', I zoomed in to the design of the return-kit. The return-kit is usually a package sent by companies, containing instructions, pre-paid shipping labels, and a package for users to put in the device ship out safely. To gain more ideas on the return-kit design, a benchmarking was conducted for evaluating return-kits design from Apple, Nespresso, Gillette, and HP (Appendix G).

Key findings from benchmarking

- The return-kits for electronics are necessary to provide sufficient protection.
- The advantage of offering return-kits is that the device can be taken back in a standardised and secure way. Moreover, the instruction can be used to communicate user's contribution for the environment, which may give users' positive emotions. And the process of packing up the device would create a subtle ritual that is quite different from throwing devices into collection containers.
- A visualized instruction manual is necessary for users to understand the packing steps. Apart from the manual, clear instructions on the box can assist users to pack up intuitively.
- The plastic film can be used for fixing the device in the package. This is useful for flat devices such as iPhone but may not be suitable for irregularly shaped products such as Grooming products.

Design requirement for the return-kit

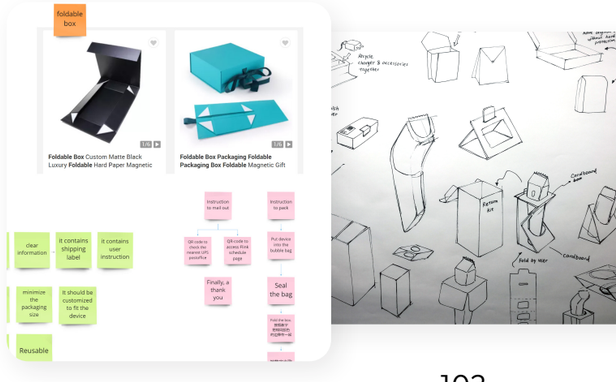
Based on the preliminary ideation, benchmarking analysis and some desk research, a list of specific design requirements for return-kit is summarised as below.

- The return-kit should be easily delivered to the user while the user does not have to wait at home.
- The size of the return kit sent to consumers should be fit in the standard mailbox in the Netherlands.
- The return-kit should be intuitive to use by providing clear and visualised instructions
- The return-kit should communicate the value of return.
- The return-kit should allow the user to perceive the value of the return, which should be different from throwing general waste.
- The return-kit should provide strong rigid outer packaging to prevent the batteries from leakage. And the package should make sure batteries will not contact with each other if more than one batteries are shipped together (Lithium Batteries, n.d.).
- The return-kit should use recyclable or compostable materials to minimize the carbon footprint.
- The package should minimize the use of material and the packaging size while also fitting the size of different Grooming devices.

Ideating on the return-kit

Based on the design requirements, I did further exploration on the design for return kits (Appendix I)

Fig. 4.15 Ideation on return kit



4.3.2 Intermediary concept

Compared to the preliminary concept, the intermediary concept has mainly refined the following aspects:

- The concept prototyped two of the promotion channels in order to provide user test participants with a tangible experience of being informed by social media adverts and promotions in retail stores.
- To give users an immersive feeling of browsing the website, the landing page visualisation has been adjusted to a Philip's visual style and an interactive landing page prototype is developed for conducting further user evaluations.

Fig. 4.16 Storyboard of intermediary concept

- Sections in the landing page such as 'device condition evaluation' has been elaborated.
- The concept has improved the launching strategy.
- The concept has refined the return process of using a return-kit.

To describe how different elements were improved in a systematic view, the intermediary concept is presented in a storyboard (Figure 4.16). The intermediary concept has same three service stages as the preliminary concept. Several specific ideas generated from the initial ideation stage 4.1 are incorporated and prototyped as touchpoints, which aims to give a more concrete manifestation of the elements. As many elements in the preliminary concept are explained in 4.2.1, this section would mainly focus on the description of the refinements.

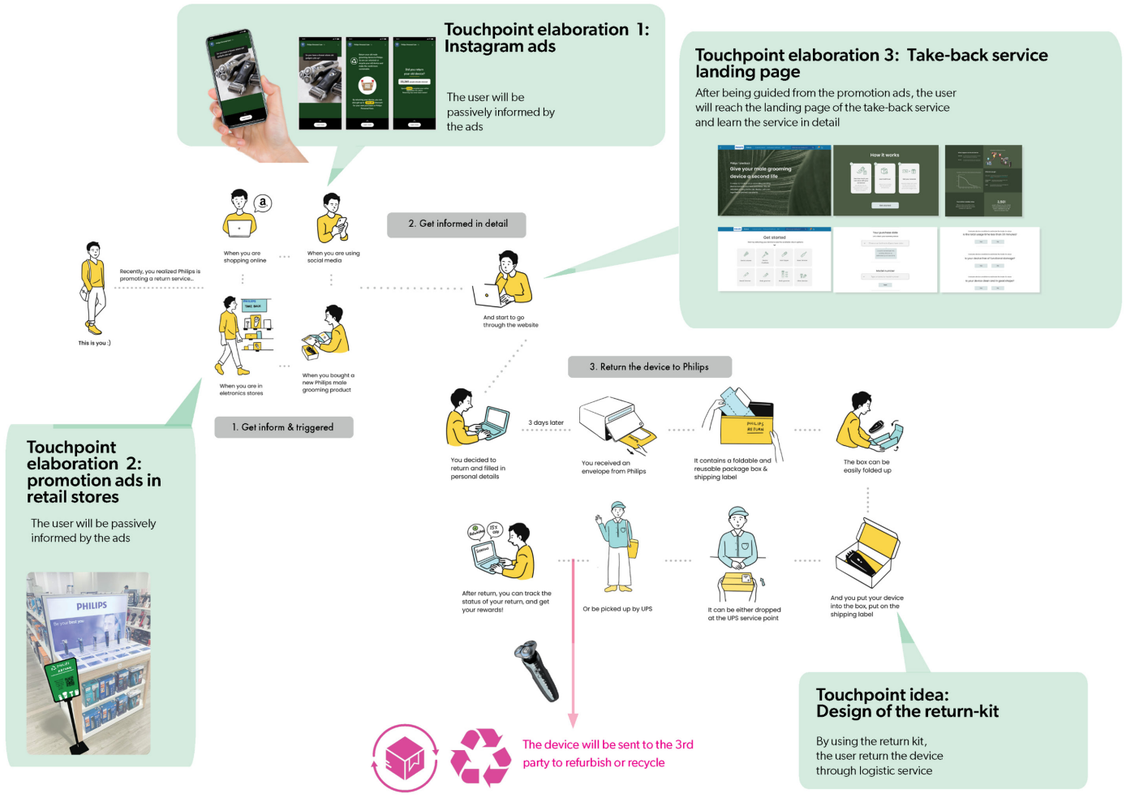


Fig. 4.17 Overview of intermediary concept

Description of the refinements

Social media and retail stores promotion

The Instagram advert aims to explore which way of communication could effectively attract the users. It starts with an image of old shavers, aiming to remind users of the old Grooming devices kept in the drawer (Figure 4.18). Afterwards, it introduces the take-back service scheme while emphasizing the service's sustainable vision and the financial incentives to attract the circular enthusiasts and the profit seekers, separately (Figure 4.19). Finally, the advert stresses that many people have already returned the device, aiming to motivate users by applying social nudge (Figure 4.20). Moreover, users can swipe up the advert

Fig. 4.18~20 Instagram promotion prototype

anytime to enter the service landing page. Promotion will also be launched in the Grooming area of retail stores, which targets on people who are interested in new Grooming products. People can access the service landing page by scanning the QR code on the advert or reaching out to retail store employees for more information.

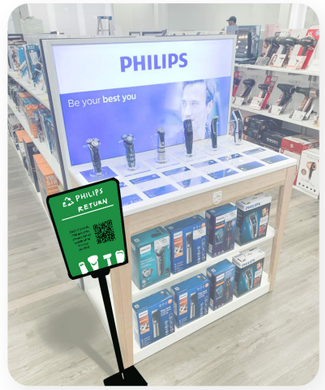


Fig. 4.21 Retail store promotion prototype

Launching strategy: from 'flash campaign' to a regular service program

To avoid the scenario that users miss the take-back flash campaign and need to wait several months to return, the service is refined to be available throughout the year. However, the promotion campaign such as "return during Black Friday to get more benefit" will be kept for effectively informing and triggering users.

Device condition checking

Although the refurbish stream only takes a few percentages, putting all the devices to recycle would reduce the environmental value that could have created from this service and there will be few advantages of this service compared to the general municipal waste collection service. However, the triage process at Philips may be costly by testing every piece of returned device. Therefore, I decided to let users conduct an initial checking so that Philips may save effort on device checking by taking the user's self-check result into consideration. Moreover, the user can get advice on the availability to repair according to their device information and condition.

Furthermore, the trade-in discount is determined by the condition of the device. The better condition the device has, the more discount the user can get. As a result, the user needs to check the device condition by answering five questions and get an estimation of the discount.

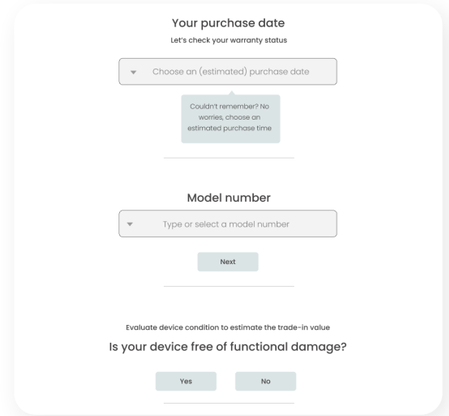


Fig. 4.22 Device condition checking

The types of products that are accepted and the scheme for gift card redemption

To generate potential profit by converting consumers from other brands, the concept allows users to return any Grooming devices regardless of the brands. In return, the consumer will get a trade-in discount that can be used for all types of personal health products instead of only Grooming products. The gift card can be used for either the next purchase or a purchase within the last 14 days (Figure 4.23). However, it is only valid for earlier purchases at Philips official webshop instead of at other retailers, as it is unfeasible to verify purchases at other stores.

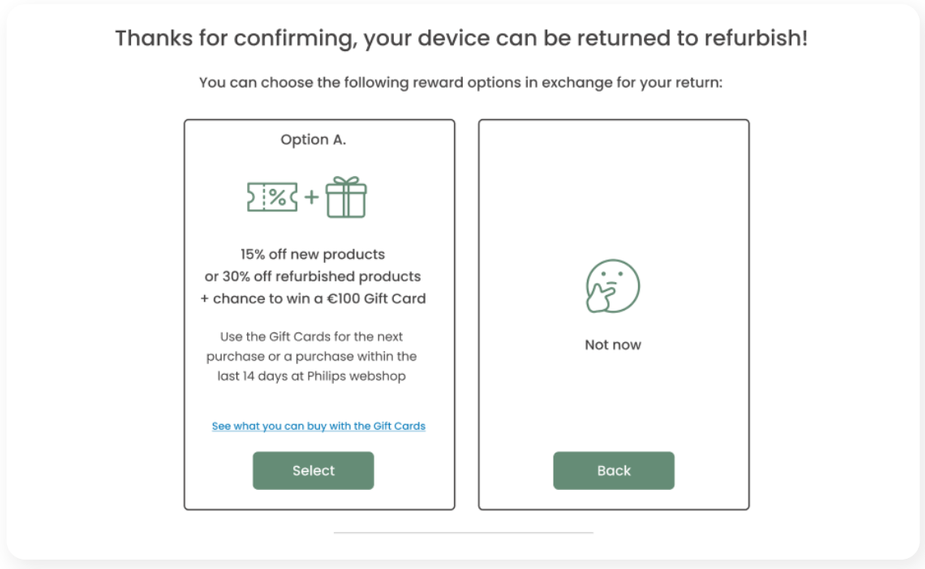


Fig. 4.23 The scheme of incentives

Returning the device by using the return-kit

After the user has checked the device condition and decided to return, the user can request for a free return-kit. The return-kit contains a foldable box, an instruction and a pre-paid shipping label. It will be shipped to the user's mailbox so there is no need for users to wait at home. Afterwards, the user can pack up the device by following the instructions, and then return the device in two different ways: (1) Drop-off at Philips partner retail stores; (2) Ship out through Philips's partner logistic service providers such as UPS or PostNL.

In the preliminary concept, the user can drop off the device in Philips's collection containers at waste centres and grocery stores, which seems unlikely to make users feel the value of return. Therefore, I decided to leave the collection machine out of the intermediary concept as it would be hard to meet the design requirement within a limited time of this thesis project.

After ideation and benchmarking on return process, the return-kit was selected as the way for returning. First, the return-kits can take back the devices in a standardised and secure way. Second, the instruction can be used to communicate user's contribution for the environment, which may give users' positive emotions. Furthermore, the process of packing up the device would create a subtle ritual that is quite different from throwing devices into collection containers.

After collection

The returned devices will be picked up by logistics partners directly from users or from the retail store partners. The employees at logistics warehouse would be responsible for checking and confirming the return. Afterwards, users will automatically receive the digital gift card by email.

The returned devices are transported from the logistics warehouse to the third-party plant for a preliminary triage. Products from other brands will be sent for recycling, while Philips products will be first diagnosed to see if they meet the refurbishment requirements and then send the products for refurbishing and the others for recycling separately.

4.3.3 Evaluation of the intermediary concept

The evaluation sessions were conducted with users, the supervisory team, and Philips professionals, and users separately. The evaluation with the supervisory team and Philips professionals aims to assess the concept direction and feasibility. The user test aims to investigate whether it can effectively increase users' motivation and ability to use this service.

Approach

Participants

The participants are composed of the supervisory team, a Philips service designer, a Philips repair and refurbish manager, and four users who participated previous user research.

User test research questions

To investigate user's motivation to use the take-back service after reviewing the concept

- How is the communication of the concept?
- How is the user's perceived value from each element? Does the concept make them painless by compensating for their value-loss?
- How does each element influence their motivation?

To investigate user's ability to use the take-back service after reviewing the concept

- How is the concept usability?
- Does the concept increase user's awareness of Philips take-back service?

Procedure

For the evaluation sessions with the supervisory team and Philips professionals, I presented the service flow and the elaborated touchpoint prototypes. Some discussions took place when some elements were unclear. The discussions were documented and summarised as key takeaways in subsequent content.

For the user test, a roughly 40-minute interview was conducted for each participant. It started by taking users through the return process with a storyboard. When reaching each touchpoint with elaborated prototypes, participants were asked to evaluate the touchpoint on a scale and give a brief explanation. The interview questions can be found in Appendix H. The statements for evaluation were formulated to investigate participants' motivation and ability to use the service. In addition to the rating, several open questions were asked to have a better understanding of how the concept affects participants' decision making.

Key takeaways from the evaluation

It is risky to diagnose the device condition

depending on the user's self-check result.

It's nice and feasible to have a platform where people can measure the state of their product and provide suggestions for the after services. However, Philips recognizes that self-assessment by consumer always needs to be followed up by in-depth analysis by a product specialist, as self-assessment by the consumer cannot be guaranteed to give correct assessment.
(Feedback from Philips repair and refurbish manager)

The new design of Philips Grooming products in the future makes it possible for more products to be refurbished and repaired.
(Feedback from Philips repair and refurbish manager)

It is very feasible to hire a third party to conduct the triage for refurbishing, recycling, and part harvesting.

(Feedback from Philips repair and refurbish manager)

The device condition checking process is not convenient enough and it generates unnecessary effort for the user.

As Philips has dozens of different Grooming product models, a participant felt the category selection process was time-consuming.
(Findings from the user test)

It is difficult for the participant to recall the time of purchase.
(Findings from the user test)

If the device could hardly be refurbished, the difference of gift card value may not influence the user's decision a lot as the Grooming products are usually not high-end products unlike smartphones. Therefore, the service does not need to get people go through all the questions as the questions for condition checking might be difficult for users to understand. For instance, people may not understand what a 'functional damage' is.
(Feedback from the supervisory team)

It is better to only focus on return for refurbishment or recycling and leave out the suggestions for device repairability.

(Feedback from the supervisory team)
Incorporating the repair service to the concept would make the concept much more complicated as this project is only focusing on creating a service for the divestment scenario.

The communication of the concept should be honest.

If the return process may take more than five minutes, emphasizing 'the process only takes 5 minutes' would trigger a backfire that users may perceive overstatement.
(Feedback from the supervisory team)

The information structure of the landing page could be adapted. While a trigger may be appealing to a certain persona, it may cause an unpleasant reading experience for other personas.

(Feedbacks from the Philips service designer)

The participants with 'profit seeker' attribute wanted to directly start returning. Therefore, they found other elements, such as Philips's sustainable vision and other people's demand for refurbishment, a bit boring and overwhelming.
(Finding from the user test)

Some elements targeted on the profit seekers are not appealing to the participants with 'profit seeker' attributes, but the overall concept is attractive to them.

(Findings from the user test)
All the participants with 'profit seeker' attributes found the service very engaging and would like to quickly start the return process.

Group return is not appealing to the participants. Because Grooming devices are very personal, it's weird to ask friends to return together.

The declining curve of trade-in value cannot trigger consumers who have cheap Grooming devices. Moreover, most participants chose to skip reading the curve as they subconsciously feel that is time-consuming.

The overall concept is appealing to participants. But the hibernator and the circular enthusiasts may not perceive enough value from the elements targeted on them separately.

All the participants found the service appealing as they think the financial incentives are attractive. However, a participant has less motivation in the incentives as he is not interested in buying new products.
(Finding from the user test)

The circular enthusiast may not perceive enough environmental value from the concept. One participant with the 'circular enthusiast' attribute felt his contribution to the environment was not tangible.
(Finding from the user test)

Participants perceived little connection between their return behaviour and others' demand for the refurbished products.
(Finding from the user test)

The concept focuses too much on the trade-in scheme that targets on the profit seeker, while lacking incentives or stimulus for the other personas.

(Feedback from the supervisory team)
I should 'think out of the box' and explore more possibilities. If some ideas are too innovative for the current market, I could make a roadmap to indicate the timeline for implementation. (Feedback from the supervisory team)

The return process is user-friendly to the participants, while the return-kit could be improved in terms of the way of packaging.

All the participants considered the return process to be convenient and acceptable. One participant expressed his concern about whether the return-kit would fit his shaver from other brands. Another participant suggested that the device could also be packed up by his own box hence reducing the effort.
(Feedbacks from the user test)

To reduce the material usage, the return-kit may not need an extra exterior package or envelope as it may not add to the user experience.
(Feedback from the supervisory team)

The package could be different for devices returned for recycling and refurbishing. The device that returned for refurbishment should be well-packed to avoid cosmetics and functional damage during transportation, while the device for recycling may have fewer restrictions.
(Feedback from the supervisory team)

The improvement directions:

Stage 1: Inform and attract.

4.4 FINAL ITERATION

The key takeaways from chapter 4.3.3 lead to several improvement directions for the final iteration, which can be summarised as below. Following the directions, I reviewed earlier ideation outcomes and conducted several small ideation sessions individually and refined the prototypes of several touchpoints. As a result, a final concept is developed and presented in the Chapter 5.

- The communication of the promotion and the landing page needs to be honest and reasonable.

Stage 2: Guide and support

- The user self-check section needs to be optimized or left out.
- The concept needs to leave out the repairability suggestion section and only focus on the divestment scenario.
- The information structure of the landing page could be adapted to avoid non-target groups being overwhelmed.
- Although all the participants had positive feedbacks for the return process, the result might be limited as the participants were not typical convenience seeker. Therefore, the concept could still explore the possibility for more return options.
- To reduce the material usage, the return-kit may not need an extra exterior package. And the package could be different for devices returned for recycling and refurbishment.

Stage 3: After collection

- The service will create more value when the refurbishment stream increases in 2025.

Other directions

- The concept needs to identify a roadmap for the implementation. So that different elements can be mapped out on a timeline based on the feasibility at different horizons.
- I need to 'think more out of the box' to bring up solutions for motivating other personas other than the profit seeker.

05
DELIVER

By incorporating the insights from the last iteration, the final service concept, "Philips Grooming Take-back", is developed to fulfil the project's objective. First, the concept is presented in a service blueprint, a service flow, and a system map to systematically describe the service in different layers. Afterwards, several touchpoint designs are explained in detail to show how the concept map with the earlier research analysis and design goals.

5.1 CONCEPT OVERVIEW

The design activities in the previous chapters led to the final service concept called "Philips Grooming Take-back". The goal of this service is to attract Grooming product users to return used Grooming devices to Philips for refurbishment and recycling, thereby facilitating the circular economy.

As discussed in 4.3.3, Philips Grooming devices has higher possibility for refurbishment and part harvesting after the products design improves in the future. Therefore, the final concept is designed for the time when Philips launched the improved product design. So that returned devices will create more circular value.

To systematically describe the service with different focus, the concept is presented in a service blueprint, a service flow, and a system map separately.

The service blueprint (Figure 5.1) is created to specify and detail each individual aspect of a service (Stickdorn et al., 2018) . It visualises the connections between frontstage and behind-the-scenes processes.

The service flow (Figure 5.2) aims to illustrate all the paths that the user will take throughout service process.

Finally, the system map (Figure 5.3) shows the links and actions between party, which explains how the service work in a holistic view. Supported by these figures, the final service can be explained as below.

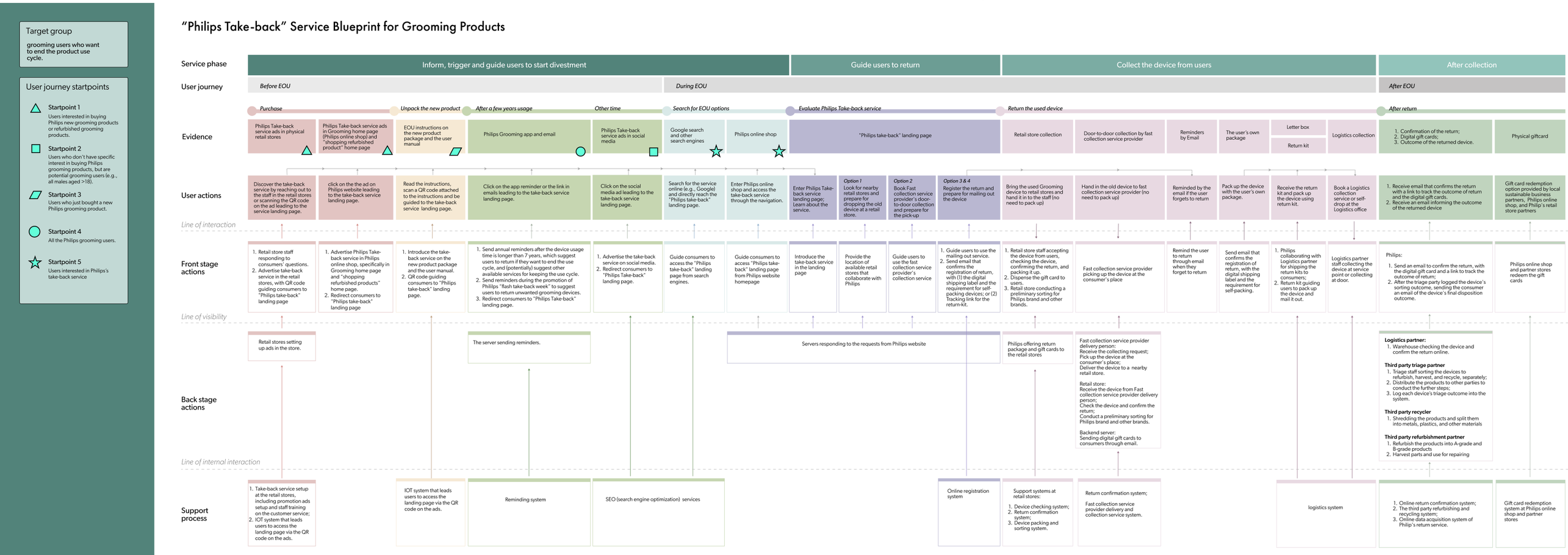


Fig. 5.1 Final concept service blueprint

Service phase 1: Inform, trigger and guide users to start divestment

The concept of the first stage provides solutions to design opportunities 4~7,12, 16, and 22. It aims to raise user's awareness about the take-back service, increase the likelihood for them to consider this service during the early "search for divestment options" phase, and trigger them to take actions.

Launching strategy

In this final concept, the service is available throughout the year. But the promotion will be enhanced to more effectively trigger the returns during events and holidays. For instance, it could be largely promoted during events with circular topics to communicate Philips's vision while also increasing people's sustainability awareness, such as promoting on the Earth Day that encourages people to protect the environment (Earth Day, n.d.) and the Circular Electronics Day that inspires people to manage their electronics in a circular way ("Circular Electronics Initiative," n.d.).

It could also be massively promoted during holidays when people are busy buying new products, such as during Thanksgiving (Black Friday) and Christmas holiday. This may prompt people to act fast for the incentives and make it easier for Philips to bring consumers to the service instead of putting lots of effort into reaching out to the consumers.

Promotion strategy

The channel and focus of promotion will vary on different user scenarios. The promotion in the Grooming area of retail stores would mainly attract users who are interested in purchasing new Grooming products as they are in the retail store with the shopping purpose. The promotion on product package is aimed to increase the awareness of this service for users who just bought a new Philips Grooming product. Promoting through Philips Grooming app (Grooming - Apps on

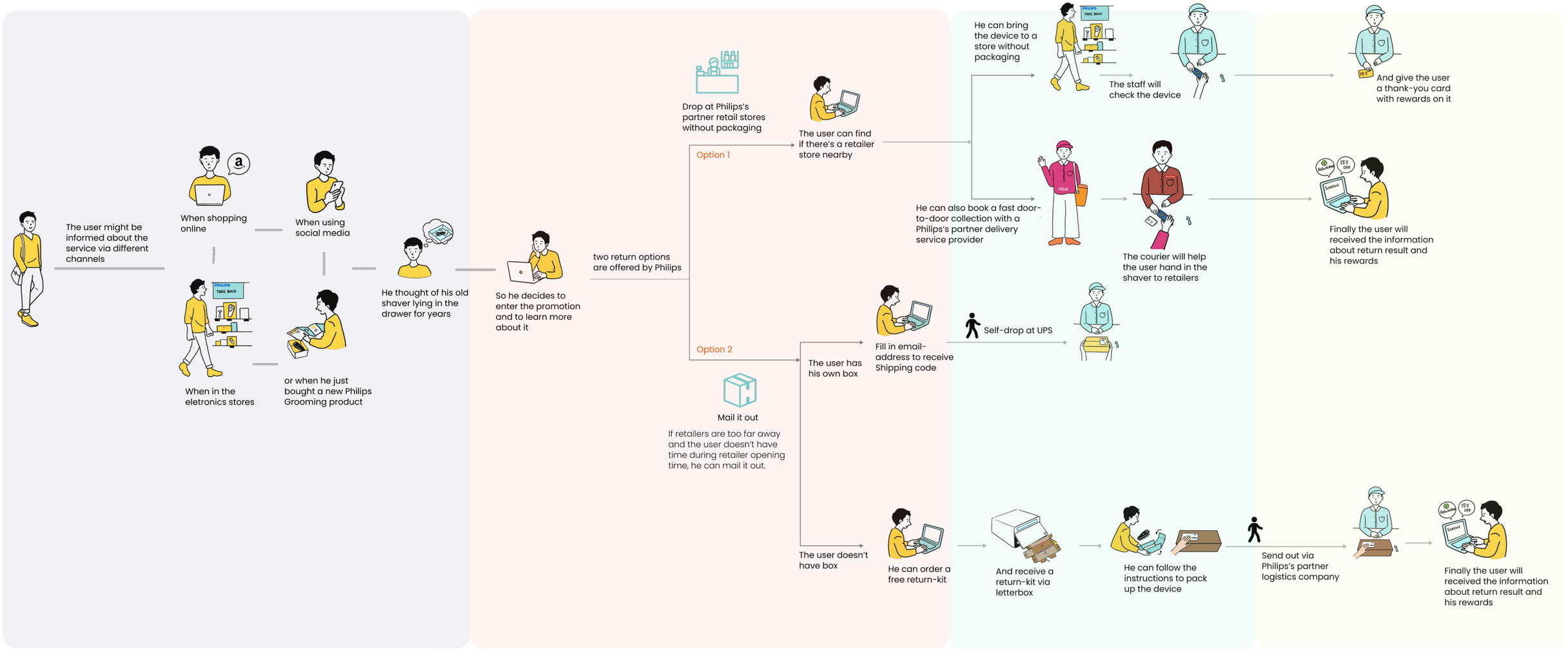


Fig. 5.2 Final concept service flow

Google Play, n.d.) and email aims to inform all the Philips Grooming users. For people who don't have specific interest in buying Grooming products but are potential users, the service will inform them through social media promotion. Finally, when this service becomes more widely known in the future, it should enhance its visibility and accessibility by incorporating the SEO (search engine optimization) service to allow users easily find it through Google search or other platforms.

Service scheme

To generate potential profit by converting consumers from other brands, the concept allows users to return any Grooming devices regardless of brand. In return, the consumer can choose two types of gift cards: gift card for Philips Personal Health products or for local, sustainable products, which will be explained in chapter 5.2.

Service phase 2: Guide users to return

Once users are getting interested in the service, they will be guided to learn more about the service scheme and return process. Apart from the guidance provided by the retail store employees, the website landing page is an important touchpoint that allows users to easily access the service. The landing page will be located in the Philips online Webshop. Compared to the second design iteration, the final concept has improved the solution mapping with different personas, which can be embodied in the landing page through contents, structures, and visuals. The concept in this stage is built on the design opportunity 1, 2, 10, 13, 15, 17, 18, 20, and 21, which will be introduced in detail in chapter 6.2.

Service phase 3: Collect the device from users

This service stage aims to offer the user flexible return options and a more effortless experience. When returning the used device, the user has two options: Returning at Philips's partner retail stores without packaging or Self-packing up the device and directly shipping to the third-party triage plant through logistics service. This process can be clearly illustrated by the service flow (Figure 5.2).

Returning at Philips's partner retail stores without packaging

As it is difficult for the return-kit to fit every Grooming product from various brands, the service may cause negative experience if the return-kit is the only way for packaging. Therefore, allowing users to return without packaging can significantly reduce their effort and thus increase their ability for using this service.

The final service concept allows users to take their products directly to a partner retail store without packaging. If there is no retail store nearby, the user can also book a fast door-to-door pickup service provided by Philips's partner delivery company and hand in the device to the courier without packaging. The fast door-to-door pickup service will be built on a partnership with the intra-city fast delivery providers such as Uber eats, Flink, Gorilla. After collecting the device from users, the courier will deliver it to any retailers nearby and pass it to the retailer staff. As a result, all the returned device collected by retailers will be packaged using suitable packages provided by Philips and ship to the third-party triage plant.

Self-packing up the device and direct shipping to the third-party triage plant through logistics service

When there is no retail store nearby or the user's location could be not covered by the fast collection service, the user can choose to self-package the device and directly ship to the third-party plant. In this case, the user can request for a free return-kit that contains a foldable box, an instruction and a pre-paid shipping label. It will be shipped to the user's mailbox so there is no need for waiting at home. After receiving the return-kit, the user can pack up the device return it through Philips partner logistics service provider such as UPS or PostNL.

Service phase 4: After collection

The collected device will be transported to the third-party triage plant for refurbishment, part harvesting, and recycle. Moreover, the user will receive gift cards once the return is confirmed by either retail stores or the logistics partner's warehouse. After the device is sorted, the user will be informed with the "afterlife" of their returned device, which aims to build trust with users and to stimulate their positive feeling for contributing to the environment.

The employees at the logistics warehouse would be responsible for checking and confirming the return. Afterwards, users will automatically receive the digital gift card by email.

The returned devices are transported from the logistics warehouse to the third-party plant for a preliminary triage. Products from other brands will be sent for recycling, while Philips products will be first diagnosed to see if they meet the refurbishment requirements, and then send the products for refurbishing and the others for recycling separately.

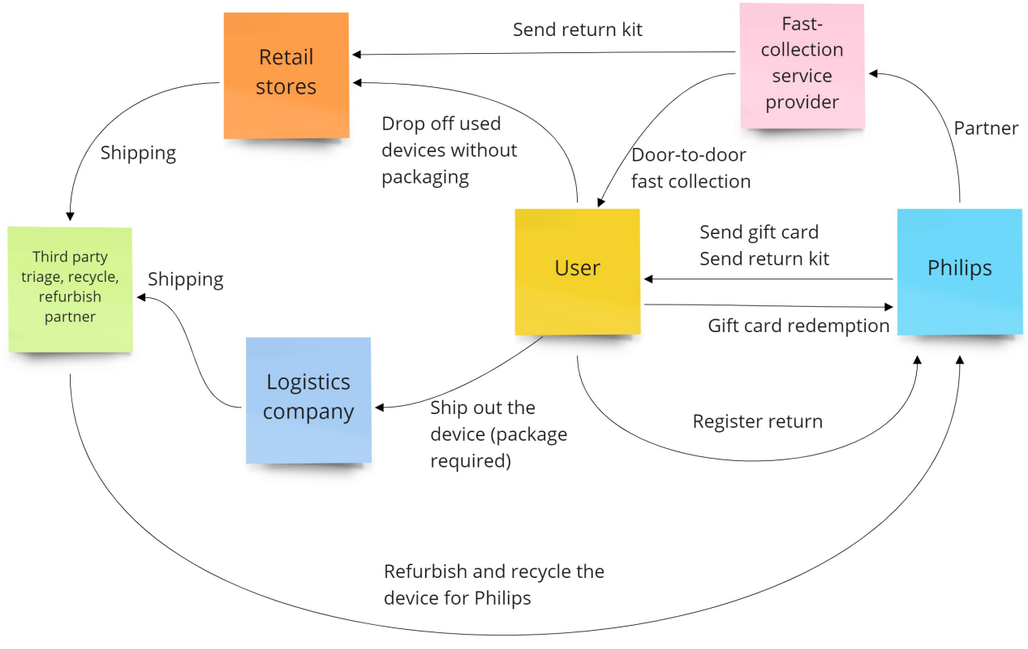


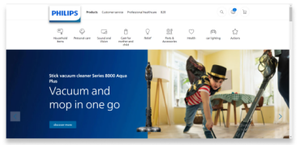
Fig. 5.3 Final concept system map

5.2 TOUCHPOINT ELABORATION

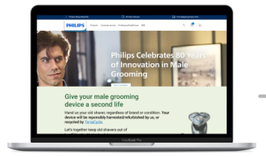
As the concept has multiple user flows, this section selected one of the user flows to explain the design of several touchpoints.

Fig 5.4 An example of user flow that starts from the Philips online shop and end with returning at retail stores

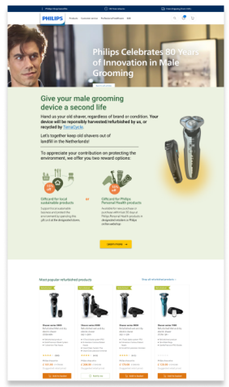
The user wants to buy a shaver. So he goes to the Philips online shopping website and look for MG products



Philips online shop



He will find a promotion of Philips MG take-back service on the top of shopping page

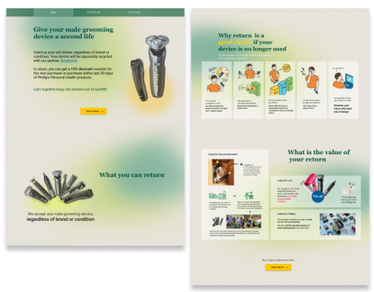


Touchpint 1

Ads in Philips MG product online shop home page

Click

After clicking on the ad, he will be guided to the landing page of MG take-back service, which is embedded in Philips online shop



Touchpint 2

MG take-back service landing page

Decide to return

After learning about the service, he decides to bring his old shaver to a nearby retail store

Return

The staff will check the device

And give the user a thank-you card with rewards on it

After return

He can use the gift card immediately

Touchpint 3

Physical giftcards

Touchpoint 1: Promotion in Philips Grooming online shopping page

This promotion aims to inform users about the take-back service while also attracting them to learn about the service by communicating the incentives. This concept contains two different types of incentives: gift cards for Philips Personal Health products, and gift cards for local sustainable products.

Gift card for Philips Personal Health products

This incentive aims to attract profit seekers. The user can receive a 15% discount Philips gift card for all types of personal health products such as shaver, toothbrushes, or hair removal products at Philips online shop or at designated retail stores that partner with Philips. Moreover, the gift card can be either used for future purchase or purchases within last 30 days, which aims to reduce the negative feelings from users who have just bought a Philips product before knowing about this service.

Gift card for local sustainable products

This incentive aims for motivating circular enthusiasts. By selecting this option, the user can get a gift card for local sustainable business. For example, locoal sustainable food company (Figure 5.5). It will create opportunities to support local shops that are engaged in the sustainability business. Meanwhile, it offsets the circular enthusiast's perceived value-loss by showing them the environmental value and building their trust with Philips.

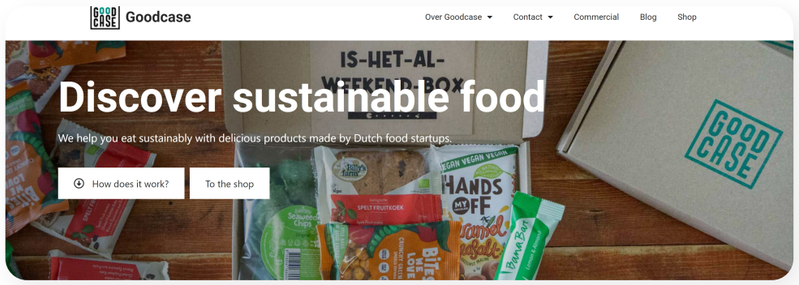
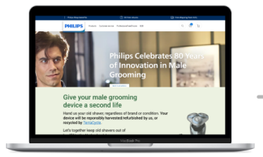


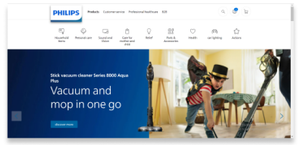
Fig 5.5 Example of local sustainable business: Goodcase sells sustainable food box that contains products made by small Dutch food startups.

The user flow

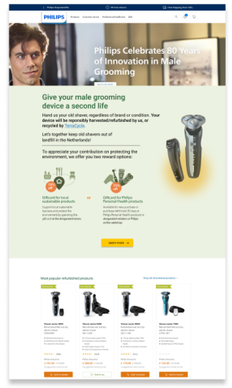
The user wants to buy a shaver. So he goes to the Philips online shopping website and look for MG products



He will find a promotion of Philips MG take-back service on the top of shopping page



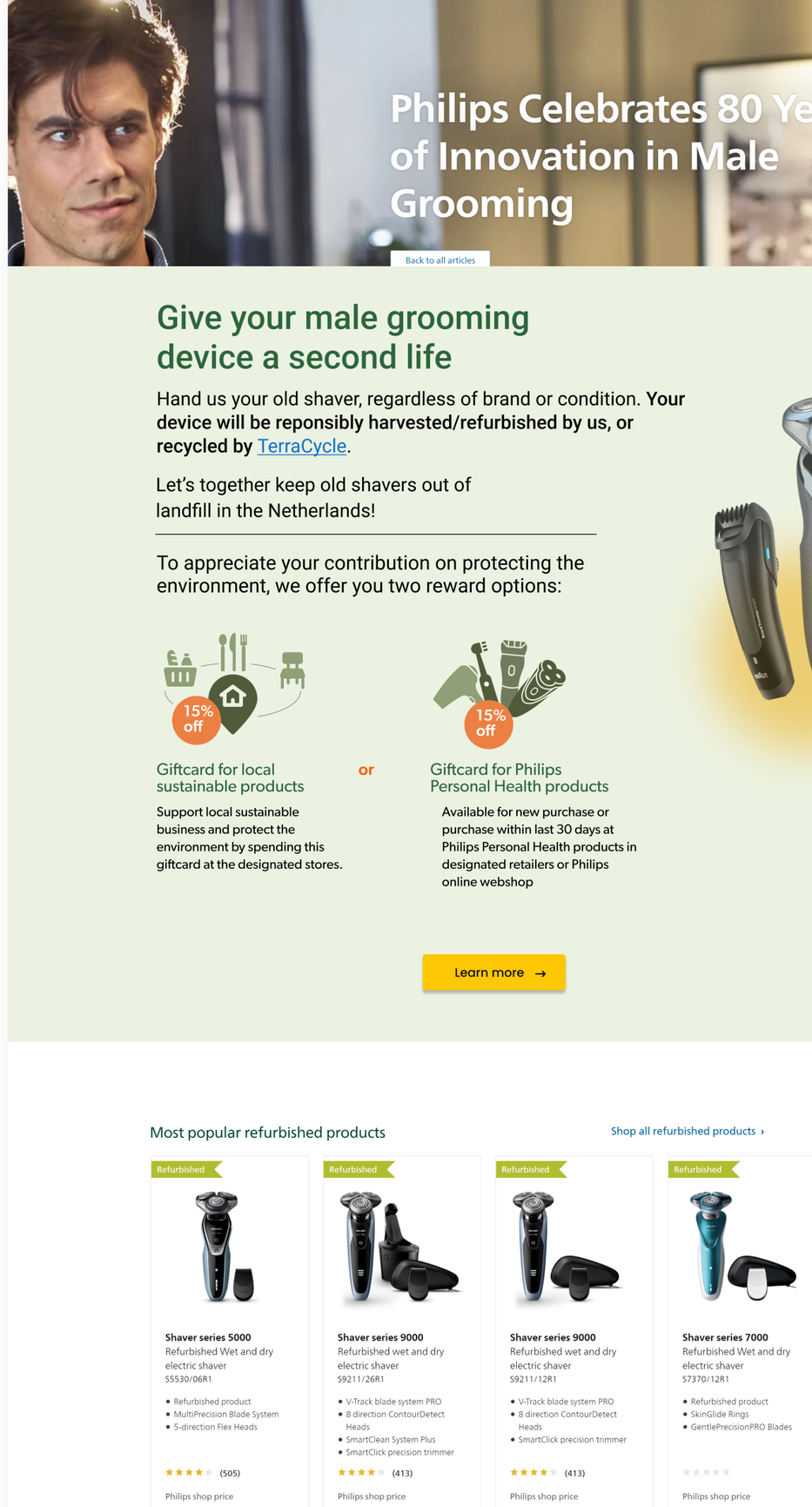
Philips online shop



Touchpint 1

Ads in Philips MG product online shop home page

Fig 5.6 Service promotion prototype in Philips Grooming shopping page



Touchpoint 2:
Philips Grooming take-back service landing page

The landing page prototpye

The service landing page is an imporant touchpoint to apply the behaviour change interventions. In this prototype, each section plays different roles to motivate the target users.

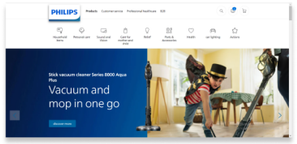
The user flow

The user wants to buy a shaver. So he goes to the Philips online shopping website and look for MG products

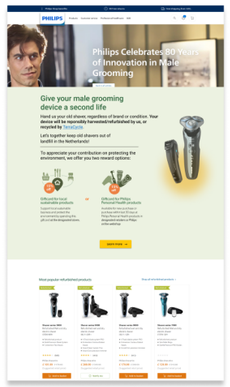
He will find a promotion of Philips MG take-back service on the top of shopping page

Click

After clicking on the ad, he will be guided to the landing page of MG take-back service, which is embedded in Philips online shop



Philips online shop



Touchpint 1

Ads in Philips MG product online shop home page

Touchpint 2

MG take-back service landing page

The interactive prototype:

https://www.figma.com/proto/2ZyFoXFhEm7ffuhqXE1SU0/Iteration-3?page-id=11%3A1763&node-id=11%3A1764&viewport=288%2C48%2C0.25&scaling=min-zoom&starting-point-node-id=11%3A1764&hide-ui=1

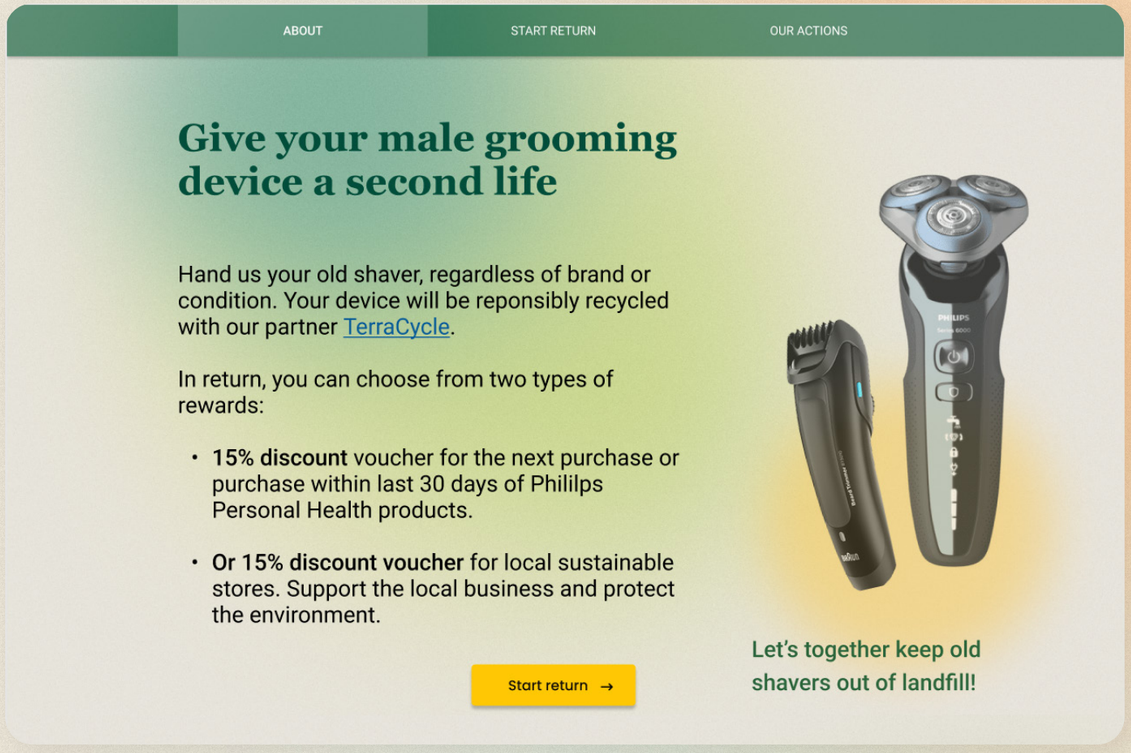
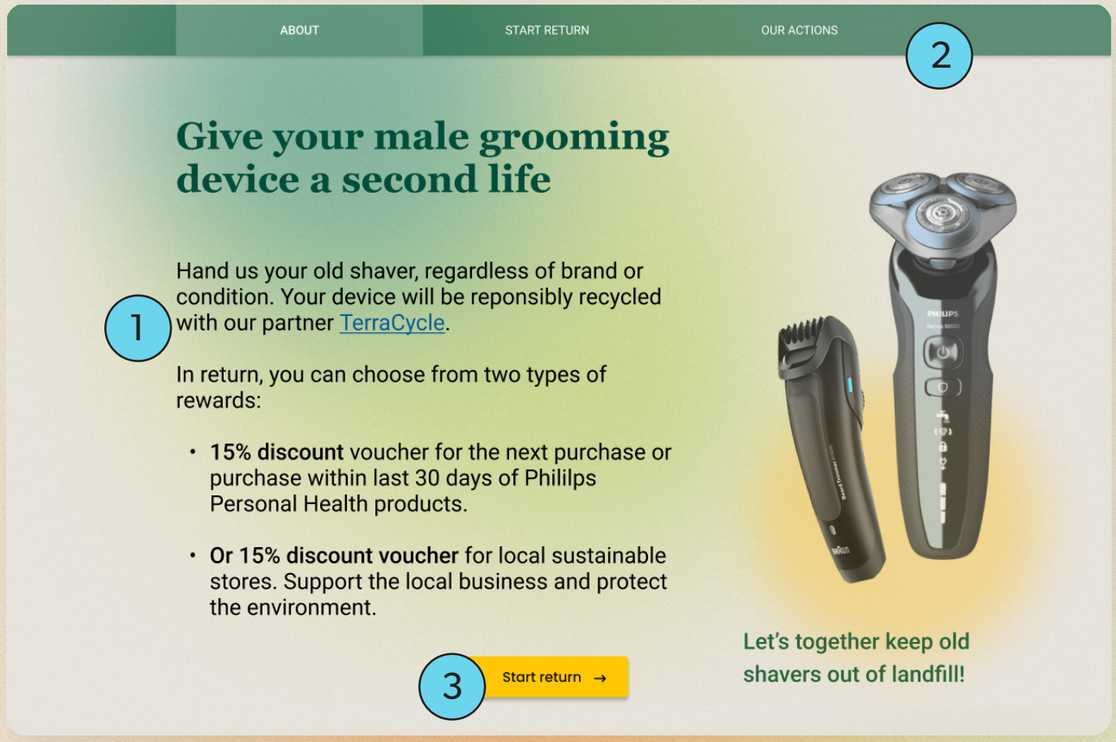


Fig 5.7 Service landing page --- home page



4. Visualisation of devices accepted

Target on all the users

The visualisation shows Grooming devices from different categories and brands, which may serve as a prompt to remind people of what they have kept in the drawer: "Oh I almost forgot I have this nose trimmer!"

3. Direct access to start the service

Target on convenience seeker and profit seeker

1. Communicating the partnership

Target on circular enthusiasts

Communicating the partnership with the third-party recycling and refurbishment company would increase the circular enthusiasts' motivation by gaining their trust.

2. A navigation

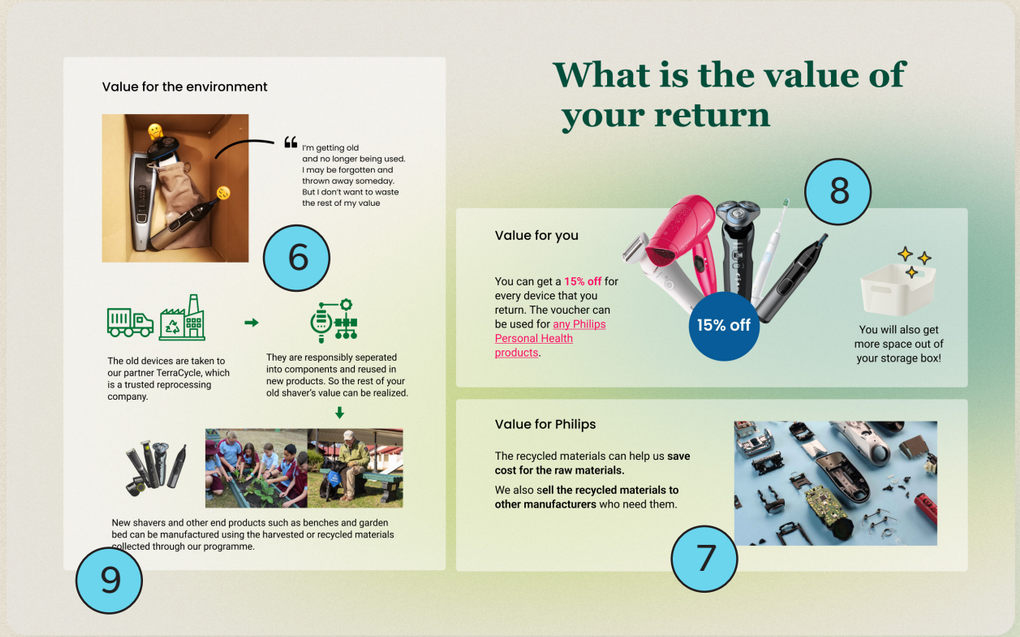
Target on all the users

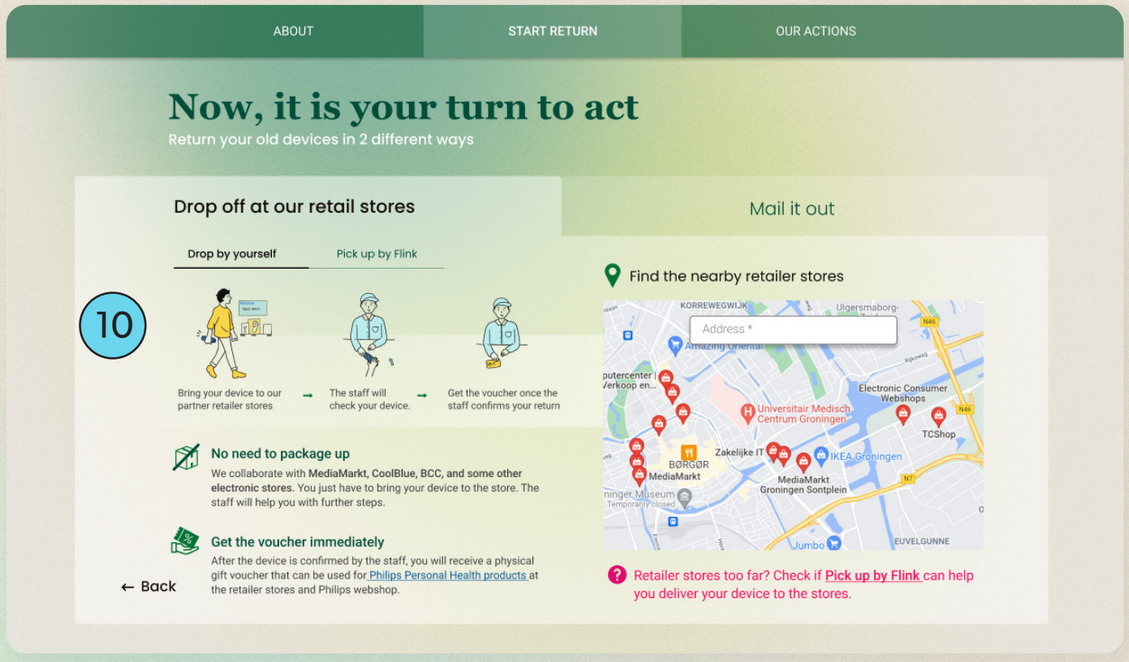
The tab enables different types of users to quickly access the desired content instead of going through all the content. The convenience seeker can simply start by clicking "start return", while the circular enthusiasts can go to "our action" tab to learn more about the recycle process.

5. The empathy storyboard

Target on hibernators

These two scenarios are retrieved from the user interviews, which are typical dilemmas faced by the hibernators. Hibernators store the device as they perceive a lot of value remained in it. So they assume these two ways can help them gain more worth out of the device. These storyboards aim to "wake up" the hibernators by making them realize they are "wasting" the value if they never use it. By showing the value of return in the next section, the user may have changed their perception of the remaining value in old devices.





6. Communicating value for environment

Target on circular enthusiast

This section aims to communicate the sustainable value in a tangible way by showing the real products made by the recycled materials.

7. Communicating value for Philips

Target on circular enthusiast

This section shows that Philips is also gaining benefit from the program instead of initiating a pure sustainable project, which may prevent user's perception of greenwashing.

8. Communicating financial value

Target on profit-seeker

9. Communicating the use-value of shaver's after life

Target on hibernator

10. Return at retail stores without packaging

Target on convenience seeker

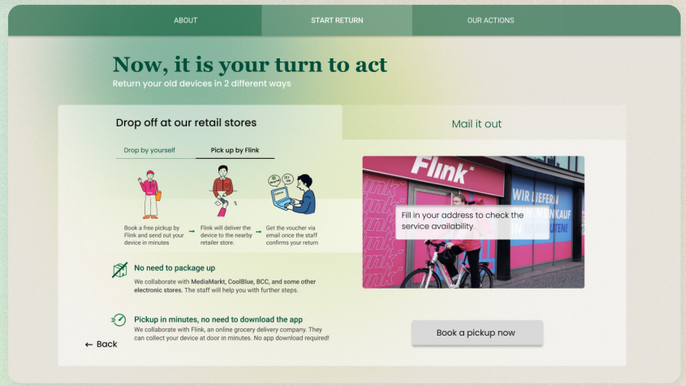
Users can take their products directly to a partner retail store nearby without packaging. If there is no retail store nearby, the user can also book a fast door-to-door pickup service provided by Philips's partner delivery company and hand in the device to the courier without packaging. No packaging requirements could significantly reduce user's mental and physical effort and increase their ability for using this service.

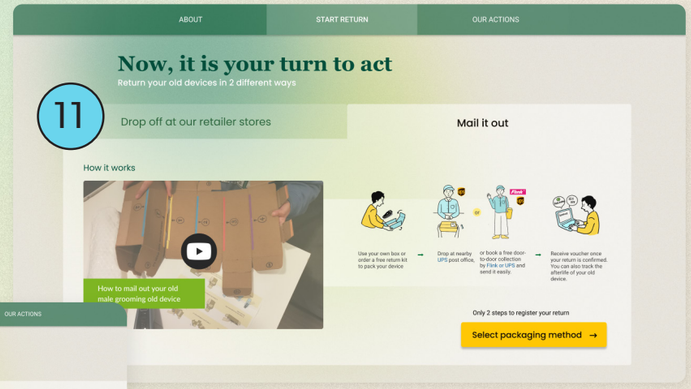
11. Self-packing up the device and directly shipping to the third-party triage plant through logistics service

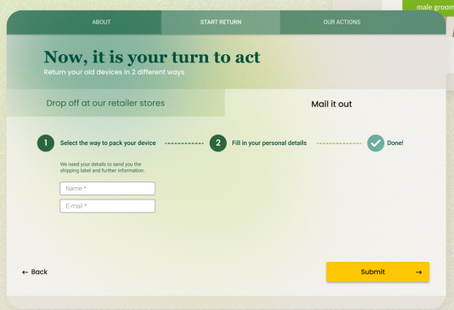
Target on convenience seeker

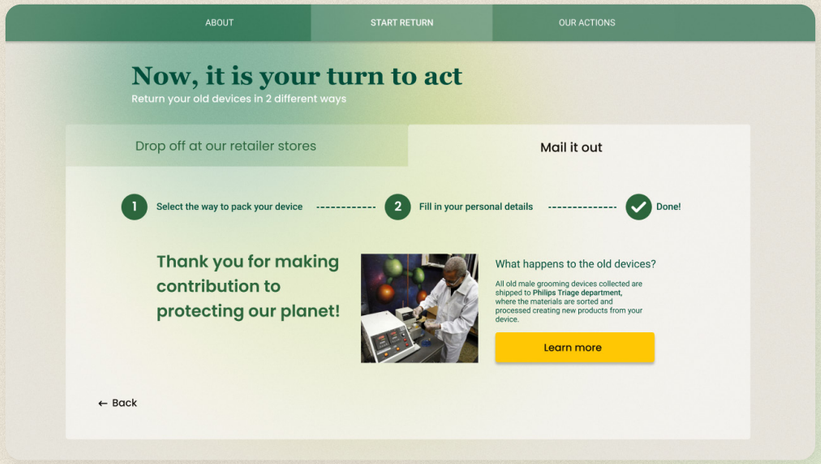
When there is no retail store nearby or the user's location could be not covered by the fast collection service, the user can choose to self-package the device and directly ship to the third-party plant. This return option considers that some people live far away from downtown or not available to return during the retailer's opening hour. Therefore, this option serves as a motivator for the convenience seeker.

The user can register this return option with two steps. First, the user needs to select whether to use their own box to or order a free-return kit for packaging. Second, personal details are needed for receiving digital gift cards and the return kit. Once completed, the return kit will arrive in the user's letterbox. After receiving the return-kit, the user can pack up the device and return it through Philips partner logistics service provider.









A more transparent process

Target on circular enthusiast

After completing the online part of return process, the page will display a "thank you" message and show an access to learn more about the recycling process. The appreciation may create happiness for the circular enthusiast. Showing a third party's recycle process may increase their trust in the return program.

Touchpoint 3: Physical giftcard design

A ritual design for enhancing the sustainability awareness and stimulating the positive emotion

The user flow

After clicking on the ad, he will be guided to the landing page of MG take-back service, which is embedded in Philips online shop

Decide to return

After learning about the service, he decides to bring his old shaver to a nearby retail store

Return

The staff will check the device

And give the user a thank-you card with rewards on it

After return

Touchpint 2

MG take-back service landing page

Touchpint 3

Physical giftcards

A physical gift card is designed to be handed out by the retail stores once they confirm the return. The card contains seeds inside, which make the card plantable and sprout. Using the plantable paper as a thank-you card aims to bring a ritual to users, making them aware that their behaviour is creating the "second life" for the old Grooming devices.

For general consumers

- Embody the feeling of "giving the shaver a second life"
- Raise sustainability awareness

For the retailers and convenience seeker

- Easier to hand out and receive than filling a email address at the store

For circular enthusiasts

- Bring positive feeling by appreciating their actions
- Create long-term engagement in the service

A plantable physical giftcard given by retailers

06
EVALUATION

This chapter first presents a business case analysis. It starts by making assumptions about user engagement. Later, the cost and revenue streams are analysed, enabling a discussion of the potential roadblocks and possible improvement directions. Then, a service roadmap is formulated to present the service implementation in 2 horizons. The short-term horizon is detailed for implementation with higher feasibility, while the long-term horizon serves as a more visionary concept. Finally, a reflection is presented on the final roadmap that discusses the potential risks and desirability.

6.1 Business case analysis

1 Assumptions of the user engagement
2 Cost stream analysis
3 Revenue stream analysis
4 Discussion

6.2 Service roadmap

1 Reflection on the roadmap

6.1 BUSINESS CASE ANALYSIS

The business case analysis aims to build a foundation to describe the feasibility of the service concept, which can provide important insights for improving the prospective development. The analysis is divided into three components: assumptions of the user engagement, a cost stream analysis and revenue stream analysis. These three sections are discussed respectively. Since the final design concept is targeting at Netherlands market, the business case analysis is also built on the data in the Netherlands. The overview of business case analysis can be found in confidential appendices.

6.1.1 Assumptions of the user engagement

Philips has launched a "Grooming Trade-in Program" pilot in UK in 2021. Compared to this pilot, the new "Philips Grooming Take-back" service that developed in this project has addressed various improvements aiming to comprehensively increase the user engagement in the aspects of, for instance, the promotion scale, the way of communication, the types of incentives, and the return process. Therefore, assumptions can be made that the user engagement rate will increase by implementing this new service concept (Figure 6.1). The following chart describes the best and worst case scenarios of the user engagement. The overview of user engagement assumptions can be found in confidential appendix A.

The best-case scenario assumes that the conversion rate from overall promotion impressions to the actual number of returns is 0.03%, which leads to annually 3000 returned devices if the total amount of promotion impressions is 10 million per year. With the same scale of promotion, the worst-case scenario estimates that only 0.0005% users finally return the device after seeing the promotion, which leads to 500 returned devices per year.

Furthermore, it is assumed that 50% users are returning the devices to retail stores in person. 25% users choose to return the devices to retail stores by booking the fast door-to-door collection service. The rest of 25% users choose to return the devices through logistic services that ship devices directly to the third-party triage plant. Finally, as users may not spend the gift cards obtained from returning, the conversion rate from "the number of vouchers sent to users" to "the number of vouchers used" is estimated to be 30% in the best-case scenario and 10% in the worst-case scenario.

The new service concept "Philips Grooming Take-back"

Estimated total amount of promotion impressions per year	Estimated conversion rate from overall promotion impressions to "actual return"		Esitimated total amount of returned devices per year	Estimated amount of device returned through logistic service		Estimation of devices **returned at retail stores by users**		Estimation of the amount of devices that are **returned at retail stores through fast door-to-door collection** and delivery service	
10,000,000.00	Best case scenario	0.030%	3000	Percentage of total amount	50%	Percentage of total amount	25%	Percentage of total amount	25%
				Number of devices	1500	Number of devices	750	Number of devices	750
	Worst case scenario	0.005%	500	Percentage of total amount	50%	Percentage of total amount	25%	Percentage of total amount	25%
				Number of devices	250	Number of devices	125	Number of devices	125

Estimated conversion rate from "number of vouchers sent to users" to "number of vouchers used"		Estimated number of vouchers spent per year
Best case scenario	30%	900
Worst case scenario	10%	50

Fig 6.1 Assumptions of the user engagement

6.1.2 Cost stream analysis

Costs can be generated from three sections. First, Philips need to invest on the preliminary research and development of this new service system. Second, a large-scale promotion is needed for raising user's awareness. Finally, operating cost is generated when running the service. The cost and revenue stream analysis are validated with the product researcher of Philips business model innovation team. The overview of the cost stream analysis in the business case can be found in Confidential appendix B and C.

Investment cost for preliminary development

In the first stage, Philips needs to invest on the development of the take-back service. Cost will be first generated for developing the partnership with the third parties. Afterwards, Philips needs to invest in creating the essential service touchpoints and infrastructure, such as the website landing page, return kit, and new design of the product package.

After evaluating with the Philips's professional, the most costly part of the service is considered to be the partnership with retail stores. This would require Philips to develop and manage a whole set-up, which includes the cost for embedding the service into different systems of each retail store and retail store training on service operation. If Philips is collaborating with all the stores of five major electronics retailers in the Netherlands, the total cost of initiating this new partnership is estimated to be €0.23 million.

The second costly part would be the partnership with the food/grocery delivery company to initiate a fast door-to-door collection service. In the current European market, the food/grocery delivery companies merely offer delivery services instead of collection services. Therefore, the "fast door-to-door collection service" might be rather experimental, thereby Philips need to spend €10,960 on innovating a new collection service flow that can be embedded it into the third parties' existing service models. Overall, the investments on partnership with retail stores and food/grocery delivery companies are estimated to generate €0.24 million cost in the first year and less for maintenance in the later

years.

The other sections, including product package and user manual redesign, landing page development, and return kit development, are estimated to cost €4,600, €5,800, and €9,100 euros separately for developing and launching these infrastructures in the first year. After the service is launched, the maintenance and adjustments are expected to be generate little cost in the following years.

Promotion cost

In order to raise users' awareness of the take-back service, Philips needs to invest on service promotion constantly. This will include the cost for advertisements on various platforms such as social media, Philips digital shopping platforms, product packages, and physical billboards. Social media promotion could be fast and effective. To reach an average of 10,000 impressions (i.e., the number of times the content is played) every day on social media, it is estimated to cost 0.25 million for the first year. To increase the visibility of the service on search engines such as Google or Microsoft Bing, the SEO (search engine optimization) service may require a cost of 0.1 million per year. Furthermore, advertising through 145 billboards distributed in different cities in the Netherlands for 6 hours a day is estimated to cost €0.6 million per year.

Operating cost

The operating cost for each device is determined by the partnership with different stakeholders and the total costs depend on the proportion of users using different return methods. The following paragraphs explain how the costs are specified for each aspect during the service operation.

The operating cost at the retail stores is estimated to be €2.5 per device. It includes customer service in retail stores, and employees' tasks such as collecting, packing, and sorting the device. For the devices collected by fast door-to-door collection service, the cost is determined by the necessary salaries for the delivery person. If it costs one hour for collecting a device at door and delivering it to a retail store, this service line would cost around €10 per device. After the devices are collected by retail stores, the transportation from retail stores to the third-party triage plant would cost €7.73 per device (Shipping at Competitive Rates | DHL Parcel, n.d.).

Returning through logistic service is estimated to cost € 15.27 per device, which includes the production and the transportation of the return kit and the pre-paid shipping labels, as well as transporting the device to the third-party triage plant. The production of return kit is €1.5 per unit, and sending return kits to users costs €3.95 per sending. This is based on the category "sending a mailbox parcel" within Netherlands through DHL (What Are the Costs at DHL? | DHL Parcel, n.d.). Later, the cost will be generated from transporting the devices from users to the third-party triage plant, which is €7.73 per device (Shipping at Competitive Rates | DHL Parcel, n.d.). Philips still needs to pay for the shipping label if devices are not sent back but the user has required for the label or the return kit.

The operating costs generated at the third-party factories includes product triage, refurbishment and recycling. The cost is defined by the necessary salaries for the operators in factories. The average operating time per device will be around 0.2 hour for the product checking in the triage stage, 1 hour for refurbishment, and 0.2 hours for recycling.

These activities would cost €3.9 per device for triage, €22 per device for refurbishment, and €3.9 per device for recycling. If 20% of devices are refurbished while 80% are recycled, the estimated operating cost for processing 3,000 devices would be €32,640.

Finally, Philips needs to pay for the discount after users redeem gift cards at Philips online shop or partner retail stores. The average price of Philips Grooming products is around €94, and the average price of all the Philips Personal Health products is around €150 . Therefore, if the gift card provides 15% discount for a new Grooming device, Philips needs to pay for average €14 per device for the Grooming products and an average of €22.5 per device for a product within the Personal Health category.

6.1.3 Revenue stream analysis

The specific revenue stream is hard to calculate with numbers due to the limited access to Philips's data and difficulties for the estimation of the potential consumer conversion. However, the revenue generated by this take-back service can be summarized on several aspects. First of all, Philips can get financial value by having users spend the trade-in vouchers on Philips's products. By taking back the used devices regardless of brands, the service can convert consumers from other brands to Philips. Moreover, if the service provides gift cards for all types of personal care products, Philips can promote an internal consumer conversion to encourage Grooming consumers explore other Personal Health products. For instance, the vouchers can attract Philips Grooming consumers to try the Philips toothbrush and thereby increasing the likelihood of more Philips oral healthcare product purchase in the future. Furthermore, Philips can save costs for buying the raw materials by reusing the materials from recycling, as well as save costs for repairing and manufacturing new products by part harvesting and product refurbishment.

6.1.4 Discussion

The concept profitability

Overall, the concept of Grooming take-back service would have financial return but may not ensure the profitability of the entire service system. According to the analysis above, the initial profit is mainly derived from the sales profit generated by the use of gift cards. The long-term profit is based on the potential sales created by external and internal consumer conversion. As the take-back service requires a large amount of investment cost in the first year and generate operating cost ranges from €10 to €60 per device while the average sales profit from gift card redemption is highly possible to be than the cost per device generated, the service seems to be not profitable in the short term and requires several years to reach the break-even point.

The potential roadblocks

Apart from the fact that it is difficult to be profitable in the short term, there are several potential roadblocks and risks when Philips is launching and running the service, which would also affect the concept's feasibility.

Retailers may decline to launch a take-back program due to limited benefits in return.

The concept creates values for retail stores if they partner with Philips and implement the

take-back service at stores. First, it can increase the customer flow at stores and thereby increasing the sales. Second, as people get gift card immediately after handing in devices at service counters, more sales profit are generated if the gift cards are redeemed right away at the stores. Finally, the implementation of the service will create an environment friendly brand image for the retailers. Other electronics companies might also initiate similar partnerships with them. As a result, more potential customers will be attracted to the stores. By addressing these benefits, Philips may successfully partner with the retailers. However, according to the current analysis, the number of annually returned devices may not be enough to convince retailers to partner with Philips.

In the best-case scenario, it is assumed that Philips can take back 1,500 devices through retail stores in the Netherlands per year. If Philips launch the service at 394 retail stores of the mainstream retail brands, the average number of devices returned to each store is 8. As a result, there will be little increase in customer traffic or sales profit, hence no significant enhancement in brand image. Therefore, retailers may not want to launch a take back program for Philips as the insufficient returned devices results in limited benefits for them.

The grocery/food delivery companies may decline the partnership to incorporate the collection service line in their current business

As the fast door-to-door collection service model is very new to the current European market, initiating this service with a grocery/ food delivery company becomes costly and challenging. There are several reasons that those delivery companies may decline the partnership with Philips.

First, the new collection service may not be aligned with those companies' brand image as company that dedicated to a food or grocery delivery. Second, the collection service will add to the complexity of the new service system. Due to the high turnover rate of the courier service (Heiland & Schaupp, 2021), the delivery company needs to constantly conduct training for the new service system, which can be costly and inefficient. Finally, the infrequent returns may cause couriers' unfamiliarity to this collection service line. Based on the previous assumption, only 750 devices are returned through the fast door-to-door collection per year. For a delivery company with hundreds of couriers, it's highly possible that a courier may be assigned to this task once in a few months. As a result, consumers may get bad experience due to couriers' unfamiliarity with the process. Accordingly, although this service would potentially bring more consumers to the delivery companies, it is difficult for them to reach the balance between the input effort and the benefit they will get in return from this new service establishment.

The return-kit design may not achieve the desired outcome in a short term

The development of return-kit is also challenging as it's difficult to meet all the design requirements in a short term. For example, one of the major challenges is that the package should not only be adaptable or big enough to fit the size of various types of Grooming devices, but also foldable to fit the letterbox. Its volume should also be minimized to reduce the footprint during transportation. Together with other challenges unsolved, these tasks have added to the complexity and uncertainty for the return-kit research and development. As a result, the return kit development may lead to a large investment but could not ensure a desired outcome in a short term.

Improving the concept feasibility

The previous discussion shows that it is not feasible to develop the entire concept from the beginning. Therefore, it is necessary to adapt the concept based on different phases of the service development. This section aims to provide directions and opportunities for developing the service in a more feasible way.

In short-term development, the concept should prioritize the feasibility and keep the consumer experience at a more basic level. This aims to obtain small-scale achievements so that the value of the service can be validated and used as proof for further engagement with more stakeholders. In the long run, Philips can make use of the data obtained to improve and scaling up the program. As a result, the service would be able to engage more stakeholders, optimize the consumer experience, and create more values in the environment, business, and consumer aspects.

Short-term development

Engage fewer numbers of retail stores to the partnership

Reducing the number of partner retail stores can make the partnership easier to launch. For instance, Philips can partner only with MediaMarkt instead of with all other mainstream retail brands. This can benefit for both Philips and retail stores in the short term. Philips can largely cut down the investment cost for setting up the service at retail stores such as employee training and infrastructures building. For example, if Philips only partner with MediaMarkt, only 50 retail stores in the Netherlands need to be included. As a result, Philips can save €0.17 million for the investment on the partnership with retailers.

For the retail stores, this can increase the average number of devices returned to each store, hence ensuring the benefit obtained. Although reducing the partner stores negatively affects the user experience due to the decrease of collection points, it is more important to first start running this service model and gain more valuable data for further development. To minimize the negative effect on user experience, Philips should make sure consumers can easily access the other return options.

"If you never start, then you never get the opportunity to fine tune it. You have to learn with experience." --- Philips product researcher

Initiating a user-friendly collection service with logistic companies as a replacement for the partnership with food/grocery delivery companies.

The partnership with the food/grocery delivery companies may be challenging and costly as the companies may see little benefit from the partnership. However, in order to ensure users have enough ability to return, it is necessary to retain the home pick-up options as it is the top preference for some convenience seekers. According to the design requirements stated in Chapter 3, the concept should provide users with multiple return options, thus maximally meeting their needs for convenience. Therefore, as a more feasible alternative to collaborating with food delivery companies, Philips could partner with a logistic company that provides user-friendly pickup service.

For instance, the logistic company Budbee

(Budbee, n.d.) is dedicated to providing effortless user experience at both receive and return process. It allows users to return products by booking home pick-up or use self-service boxes distributed in the city without the need to print out a shipping label. For their home pick-up service, the advantage is that they ease users' pain points of the necessity to keep waiting at home. Unlike general logistics home pick-up services that require users to wait for several hours at home without any access to track the courier's location update, Budbee has shortened the booking timeslot to 1 hour and provides users with real-time location tracking of the courier (Figure 6.2). Besides, the users can also choose to leave the package outside the door instead of keep waiting at home.

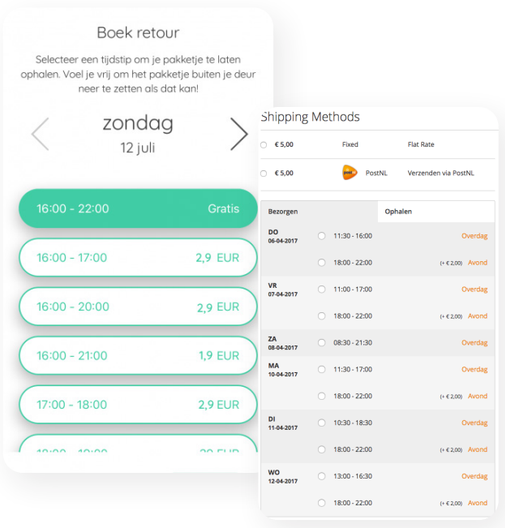


Fig 6.2. Budbee (left) vs Postnl pick-up timeslot

Therefore, by collaborating with delivery companies like Budbee who value the convenience of consumer's return experience, Philips can still provide a seamless return process that could be comparable to the fast door-to-door collection conducted by food delivery companies. Most importantly, as the logistic companies have well-established service model for the return and collection process, this alternative is extremely feasible for forming the partnership and economically viable for Philips's preliminary investment.

Developing the return-kit by first meeting the basic technical requirements

As discussed in the roadblocks, the return-kit design may not achieve the desired outcome in a short term. Therefore, Philips could start running the service by first meeting the basic technical requirements. As the most important requirement is to ensure the lithium batteries are packed in a strong rigid outer packaging, it is necessary to make sure the device is packed by proper box. Therefore, the touchpoint of return-kit should not be cut down so that users are less likely to use improper packaging when they could not find boxes by themselves.

The opportunity could be to design a return-kit without considering the fitting with letterbox. In other words, users will receive the return-kit directly from the couriers instead of letterbox. On the one hand, this may result in inconvenience when users are not at home. The larger size of return-kit might cause more carbon footprint during transportation. But for Philips, this opportunity makes the development process easier and cheaper.

Save cost on the pre-paid return labels

According to the cost stream analysis, Philips needs to pre-pay for return labels even if they are not used. In other words, it generates extra cost for Philips if the user has requested for a shipping label but eventually decides not to return. After discussing with the product researcher from Philips, this problem can be solved by partnering with a third-party shipping API such as Sendcloud (Sendcloud | Europa's #1 verzendplatform voor e-commerce, n.d.) and Easypost (The Simple Shipping API, n.d.). These platforms provide management service for the shipping streams as they have automatic partnerships with various logistics providers. By using a third-party shipping API, Philips can easily track if the shipping label has been used by the user and thereby not paying for the unused ones. The API also enables Philips to track if the parcel has arrived, which saves investment for building the confirmation system.

Long-term development

Taking back the entire personal health category

After validating with the Philips Personal Health repair and refurbish manager, it is possible in the long term to take back all types of products in Personal Health category to repair, refurbish, and recycle. Therefore, it is possible to increase the device collection rate by accepting more types of personal health products. As a result, it can lead to more benefits for retailers and thereby making the partnership more feasible.

The service setup at retail stores can be designed towards a more autonomous way.

Another way to reduce the investment cost is to automate the collection service at retail stores. For instance, instead of only having the staff accept and check the device, Philips can also place self-service collection kiosks at each retail stores that enable consumers to hand in devices autonomously. The collected devices can further be easily packed by the machine instead of requiring staff to do it. Accordingly, Philips needs to invest on developing the autonomous service system. Although this direction may be more expensive than the original manual collection service, it's profitable in the long run as Philips can save the future cost of constantly training the retail stores employees.

However, this direction may lead to the challenge for the service design. A self-service usually provides limited assistance and guidance compared to the human support and is less user-friendly to older people or the digital illiterate. Therefore, there will be strict design requirements for the self-return service to provide an effortless journey, make users aware of the value of return, and ensure the basic function of collecting and checking the returns. But if the self-service system can successfully meet the requirements, it may prevent the negative user experience caused by the uncertainty of human support service. For instance, the traffic at retail stores during holidays might potentially cause bad return experience.

Encourage other electronics companies to implement take-back service together with Philips.

Once this service has achieved small wins in the short term, Philips can show the outcome to other electronics companies and engage them in a partnership for a larger-scale take-back service. The following paragraphs discuss why this direction could make the service implementation more feasible in the long term.

It will be easier to initiate the large-scale program with the possibility to be supported by laws

In 2019, the French government adopted a law regulating the mandatory display of clear information for consumers on the repairability of electrical and electronic equipment (mdepypere, 2021). It means that the legislation of electronics repairability starts to be taken into consideration in

Europe. Therefore, it is possible that take-back programs will be launched by European companies for taking back products to repair. As the circular economy is a development priority of EU (Mazur-Wierzbicka, 2021), European countries may also implement regulations in the long run to encourage companies to take back products not only for repair but also recycle and refurbish. If relevant regulations will be launched in the future, the engagement with other suppliers would become easier backed by law, and thereby increasing the viability to partner with other stakeholders and improve the entire service system.

It's easier to engage retail stores when there are more supplier partners

Furthermore, the retail stores might be more willing to launch this service if more supplier partners are engaged in this service. As discussed before, retail stores may not be willing to partner with only one brand due to the insufficient number or returned device. Therefore, partnership with multiple electronics companies can largely increase the number of returned devices at each store, thereby adding to retail stores' benefit and attracting more retail stores to embed this new business in their existing service model. As a result, consumers' motivation can be enhanced as the increase of collection points leads to easier access to the service.

It will reduce the investment cost for each supplier

This strategy makes the service implementation more feasible by having the suppliers splitting the investment cost. For instance, suppliers can together develop a take-back service system operating in retail stores that enable the store to collect devices from each supplier brand. This would significantly reduce the launching cost if Philips had developed it independently.

However, when the program starts to involve other electronics companies, Philips should no longer take back products from the partner brands and convert consumers from those brands. Otherwise, it would be difficult to involve other companies into this partnership. As a result, Philips may lose the potential benefit from the external conversion (e.g., converting Braun consumers to Philips consumers). But as the program scale gets larger, Philips will obtain more sales profit and more internal conversion (e.g., converting Philips Grooming consumers to Philips oral care consumers) because of the increased collection rate.

Food/grocery delivery companies are more likely to engage when there are more products to be returned

As discussed in the short-term strategy, Philips could partner with logistic companies first to ensure basic return experience. But as the logistic company is currently only available for appointment-based home pickup, it may still affect some convenience seekers' motivation and ability to return. In the long-term, therefore, Philips could still consider partnering with food/grocery delivery companies or initiate an innovative fast-collection service line with logistic companies. This direction becomes more feasible if Philips and other suppliers are taking back devices together through this way. It will result in an increasing number of returns, thus bringing more consumers to the delivery company, enhancing their brand image, and creating more opportunities for them.
Moreover, there is already a trend for intra-city delivery services in countries such as China, Japan, India, and the UK ((6) FlashEx: Overview | LinkedIn, n.d.; Courier Service in Bangalore | Same Day Delivery - Borzo India, n.d.; Delivery in Gurgaon - Order Food & Online Grocery Shopping | Dunzo, n.d.; Same Day Delivery | Same Day Courier | CitySprint, n.d.), which provides urgent inner-city delivery service for products, documents, flowers and any other lightweight and small-size items. Some are launched by logistics providers, and some are launched by food delivery companies or ride-hailing companies. It is possible that this trend will grow further in Europe in the future due to the rise of e-commerce. At that time, Philips could consider working directly with these service providers, which would not only reduce launching costs but also provide a better user experience.

A higher collection rate may create more opportunities for optimizing the service

As soon as the scale becomes larger and the service becomes more established, the collection rate is likely to increase. This makes some opportunities that previously seemed impractical able to be reconsidered. For instance, Philips can encourage people to work as part-time community leaders, responsible for collecting used devices within the community and send to the third-party triage plant together.

The return-kit can be improved to meet more design requirements.

In long term, if Philips are taking back more categories of products, the design of return-kit will be crucial for launching those programs. The long-term direction could be standardizing the return-kit for different product categories and minimizing the packaging size and material, while providing users with effortless packaging experience.

6.2 SERVICE ROADMAP

By incorporating all the information from business case analysis and discussion, a service roadmap is developed to illustrate a long-term strategic planning (Figure 6.3). The timeline of the roadmap has been divided into two timeframes: horizon 1 (from 2025 to 2027) and horizon 2 (from 2027 to 2030). Horizon 1 describes the tasks required to bring the service into a feasible starting point. Horizon 2 introduces the potential add-ons that will improve the service and create more values.

Activities in grey

Philips should first start with the basic and necessary activities. According to the analysis and discussion in chapter 6.1, some tasks are feasible and necessary to be implemented in horizon 1, including the redesign of product package and user manual, social media and offline promotion, the take-back service landing page development, the use of third-party shipping API and the partnership with the third-party plants.

Activities in yellow

In horizon 1, Philips can start by taking back Grooming products from any brands to increase consumer awareness and obtain profit from the consumer conversion. If this service gets successful and more widely-know, the service in horizon 2 can involve more electronics suppliers. Then Philips should only offer gift cards for Philips products. In the long-term, Philips can start taking back products from other Philips Personal Health categories when the relevant product designs are improved for easier refurbishment and recycling.

Activities in green

It's important in the short-term to successfully "kick-off" the service program and gain more valuable data for further development. Therefore, in horizon 1, Philips could start by partnering with only one retailer and setting up the service only in big cities to cut down the initial investment cost and increase retailer's consumer traffic at each store.

In horizon 2, Philips could show other retailers the outcome in horizon 1 and indicate that partnerships could be a great opportunity for each party. This would become easier with the involvement of other suppliers. Moreover, the service setup at retail stores can be designed towards a more autonomous way to save the cost in long-term.

Activities in orange

In horizon 1, Philips could first initiate a user-friendly collection service with logistic companies as a replacement for the partnership with food/grocery delivery companies. In horizon 2 when the number of returned devices is increasing, it is more possible to partner with fast-delivery service providers to implement an intra-city door-to-door collection service. However, if consumers have very positive feedback for the return method in horizon 1, Philips could also retain the service scheme.

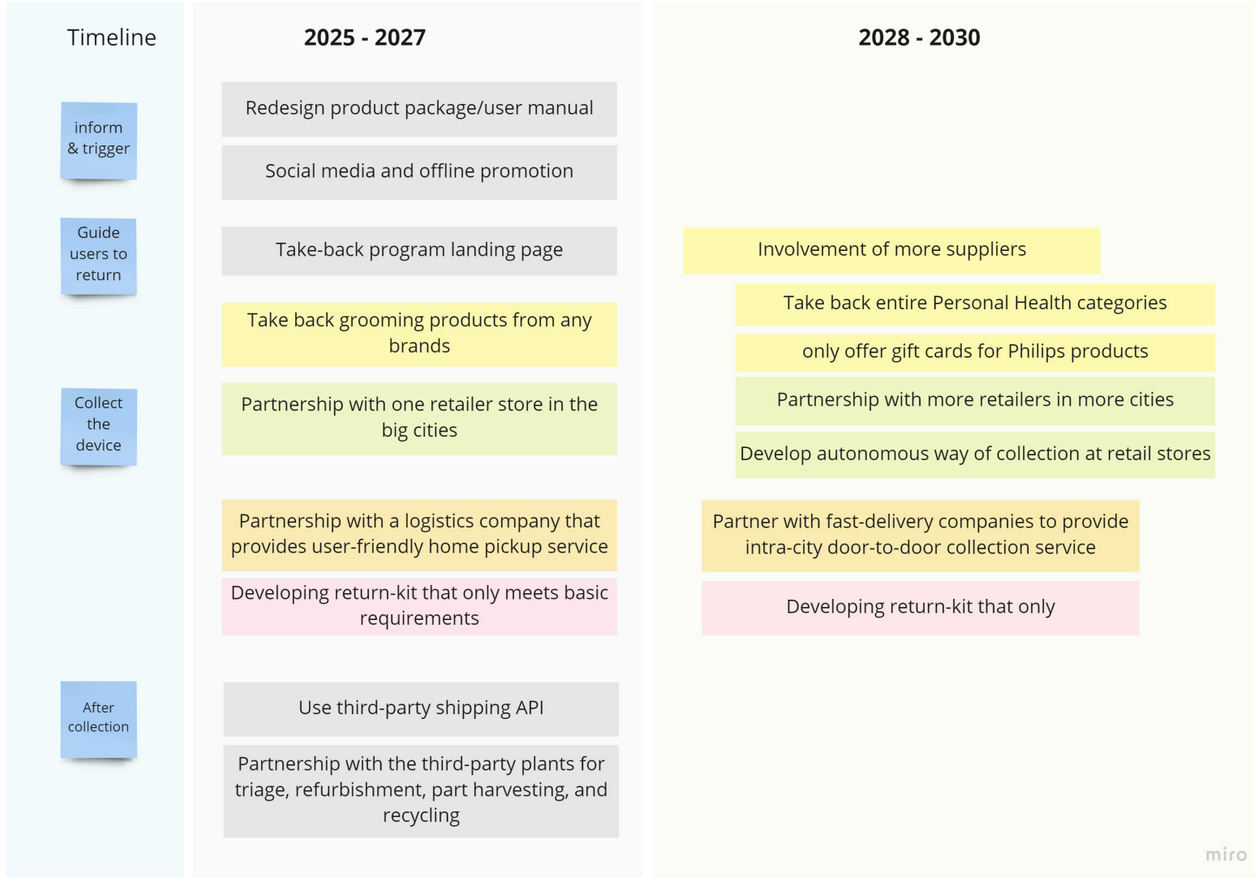


Fig. 6.3 Service roadmap

Activities in pink

To cut down the investment cost for the return-kit design, the implementation in horizon 1 could start by meeting the basic technical requirements. For instance, it should at least prevent the battery leakage and functional damage. And the size of return-kit can be designed for fitting the average size of the Grooming products. In horizon 2, the return-kit can be improved to meet more design requirements.

Reflection on service roadmap

The potential risks and rebound effects

The service roadmap has illustrated a promising implementation planning. However, there might be several potential risks and rebound effects that Philips does not want to happen.

Device is returned before reaching the end of life

As the service provides gift cards with the same value regardless of the device condition and brands, the user who has a cheap Grooming device may return the products prematurely. Users may save even more money by buying a very cheap product specifically for returns and using the trade-in gift card to buy an expensive shaver. All these scenarios would result in massive negative effect to environment. Therefore, it would be important in the long-term to develop relevant measures or conditions to avoid such rebound effect. For instance, to estimate the trade-in value based on the returned product categories.

Overconsumption due to the gift cards

As many people have more than one used Grooming devices to return, they could get several gift cards at once, which may lead to users purchasing unnecessary products. The service scheme could still be adapted reduce the overconsumption.

The unused return-kits

It's possible that some users decide not to return after they order the return-kit. Likewise, some users may forget to return. People may even order the return-kit for other packaging on purpose. Overall, the unused return-kit would result in extra cost for Philips and negative impact for the environment. To prevent this, the service can increase the prompts to remind people to return after they receive the return-kit. Philips could also apply limitations on the maximum number of return-kit that one can order at a single time.

System pressure due to the massive number of returned devices

If the service becomes a massive success, the number of devices collected may exceed the limit of what can be operated by a third parties. This could result in the extra cost for the inventory and negative user experience due to the long waiting time for gift card dispensing. Therefore, Philips also needs to prepare for and manage the risks caused by massive returns.

Desirability

End users

Currently, many users keep unwanted Grooming devices at home but having difficulty finding a satisfying way of divestment. Some others throw the device away but feel guilty and waste of value afterwards.

This service could ease users' divestment process in two aspects. On the motivation level, it can compensate for one's perceived value-loss by communicating or providing different values created by the service. On the other hand, it makes the divestment process more effortless, thereby reducing the user's mental and physical burden.

Philips

Direct financial benefit

For the direct financial value, Philips can get increased sales through gift card redemption and the potential consumer conversion. Moreover, Philips can save costs for buying raw materials by recycling, refurbishment, and part harvesting. Although in horizon 1 the service has been adapted to be less costly than the original concept, the direct financial value may not ensure the service profitability. However, the service could be a low-risk investment when considering the sizable non-financial return and potential indirect financial return in a long run.

Impact on the environment and consumer behaviour change

The implementation of the service would create environmental impact by increasing the collection rate and moving towards a closed loop. In the long term, it could also reduce the health issue coming from climate change, which is a long-term value for the environment and society, and meaningful for Philips as a healthcare industry. Further, it can raise consumers sustainability awareness, which can foster a long-term circular behaviour and make them easier to engage in future circular programs, thereby creating larger impact.

Brand image

By creating the environmental impact, the service will reinforce the sustainable brand image that Philips has been working on. The goal of the concept aligns with Philips development goals for 2025, including to generate 25% revenue from circular products, services, and solutions, and to put zero waste to landfill (Appendix).

Moreover, as there are few similar services in Europe for Grooming products so far, the service implementation could make Philips as a leader of the service in Grooming industry, similar to the Apple Trade-in in mobile industry and Nespresso coffee capsule take-back service in the coffee industry. Finally, the partnership with fast delivery service providers in the long-term might also potentially make Philips as a front-runner as this service model is rather modern, dynamic, and appealing.

Business value

Philips can also retrieve business value by gathering the information from used devices. The device usage data collected form competitors' products would also add to the business value for Philips.

Other stakeholders

The service concept will also create more values for the other stakeholders. First, it can enhance the environmental-friendly brand image of each party. Second, the service could bring more customers to the retailers, the fast-delivery companies, and logistics companies. Furthermore, the future partnership with the fast-delivery company might enable them to establish a front-runner image in the delivery service industry. Finally, the service will reduce the government's concern in dealing with the e-waste issues, thereby facilitating the circular economy and generate larger environmental impact.

07
CONCLUSION

Conclusion

The core aim of this thesis was to investigate how Philips can facilitate closing the loop by motivating Grooming consumers to send back the grooming product once it's no longer used.

To tackle this challenge, the project first dived into the behaviour change methodologies. The research approach of this project was built on Fogg's behaviour model, which serves as a starting point to formulate research questions and to explore the relation between influencing factors and user behaviour and the association between influencing factors.

Later, valuable information was gathered and analysed from context research, benchmarking, service safari, and in-depth interviews. The interview data analysis resulted in a systematic summary of the effect of various factors on Grooming user's EOU behvaiour. As one of the data integration outcomes, the personas indicated that a user's motivation to dispense with a product largely depends on the individual value weighting system and whether the divestment option can compensate for the loss of a specific value. A user's ability to send back products is determined by the person's intrinsic attribute (e.g., laziness) and the perceived extrinsic effort. Based on different individuals' intrinsic attributes and the weighting criteria of various values, five personas are created to identify the user groups in the Grooming context.

A set of design opportunities were created based on each influencing factor, with the indication of the targeted persona of each opportunity. This has led to the design statement that was focused on letting different personas perform the return behaviour by using targeted interventions. Two design iterations were further conducted and evaluated with the supervisory team, Philips professionals and the users. As a result, an explicit set of improvement directions were formulated for the final design.

The thesis has been concluded with a final service concept called "Philips Grooming Take-back". It is applied with various design interventions and service strategies to create a painless and seamless divestment experience for the Grooming user. After the evaluation by conducting business case analysis, the concept could not ensure its profitability for Philips. In order to improve the concept feasibility, the potential roadblocks and future opportunities were analysed. As a result, a service roadmap is developed for presenting a long-term strategic planning with higher feasibility.

In addition to the service concept, the thesis has contributed to Philips by proposing developing the personas, design opportunities and requirements for Gooming-context behaviour change, which can be potentially leveraged for other product categories and relevant circular services.

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