# DESIGNING CIRCULAR SERVICES IN THE CONTEXT OF GENDER

MASTER THESIS

**Process Report** 

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# Designing circular services in the context of gender

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# I. Abstract

The circular economy has long emphasised the importance of closing the production and manufacturing loops to eliminate waste and extend product life cycles. However, less attention has been given to designing circular consumption practices and pathways toward a future circular society. This lack of focus also raises critical questions about the inclusivity and equality of such transitions, which poses a significant challenge for designers.

This thesis aims to explore how service designers can leverage existing research on gender inequality in sustainable consumption to design more gender-sensitive and equitable circular solutions. By conducting interviews and surveys with residents in Denmark and Southern Sweden, this thesis supports the literature findings by highlighting the differences in attitudes, associated meanings, and engagement with circular practices like sharing, repair, or recycling. The thesis subsequently argues that a more balanced and informed approach is necessary to avoid conceptualising sustainability as a female issue.

However, the thesis also reveals structural and systemic barriers to addressing gender equality in design processes and within design teams and organisations. By engaging with a group of service design practitioners, researchers, and other experts, the research reveals the absence of discussions about gender inclusion and equality in service design driven either by the complexity, sensitivity, and political nature of gender or assumptions that gender perspectives are well-covered in user-centred approach to design. Therefore, this thesis results in the development of a [ToolkitName] toolkit, which aims to aid service designers and teams working with circular service innovations in discussing and applying a gender lens to their design process and possible solutions. By developing the toolkit through multiple rounds of ideation and testing with service designers and other experts, the toolkit activities are designed to accommodate the hesitation and challenges of discussing gender by not forcing specific structures, order, or outcomes of those discussions.

Ultimately, this thesis aims to expand the understanding of sustainable consumption as a gendered experience and practice that must be considered when designing transitions toward more sustainable and equitable futures. Additionally, it highlights the importance of gender discussions in design teams and organisations.

Keywords: Service design, circular economy, circular consumption, sustainability, gender, gender sensitivity

# II. Acknowledgments

In this section, we would like to express our deep gratitude to the many people who have supported, advised, challenged, and encouraged us throughout our thesis journey.

Firstly, we owe a huge debt of gratitude to our **wonderful supervisor**, Amalia de Götzen. She was incredibly patient and encouraging as we grappled with the complexities of our chosen topic and provided valuable insights and support throughout the project. We are also grateful for her help in identifying relevant experts who could contribute to our research.

Secondly, we want to thank all participants who generously gave their time to complete our surveys and talk to us about their consumption habits and practices. Without their contributions, our research could not stand on a good foundation.

A large portion of our gratitude goes to the many service designers, researchers, and other experts who were open and willing to share their experiences and helped us ideate and test our solution. We were inspired by their reflections, advice, warmth, and eagerness to help. We draw a parallel here - to reach a sustainable and circular future, we need to step away from competition and embrace collaboration, as no single person, company, government, or continent can solve the climate crisis alone. Similarly, we can only develop a strong muscle of sustainable service design if we promote collaboration and knowledge-sharing within the local and global design community. We hope that in the coming years, we can reciprocate the help we received and be good members of the service design community.

Finally, we want to send our thanks to our families and friends for their support and encouragement. We also want to acknowledge the men in our lives who have made sure we know they care and believe in the importance of our work.

# III. Key terminology and abbreviations

# Terminology

#### Design

#### SERVICE DESIGN

Service design is a form of design as well as a research discipline that applies humancentred service design methodology and principles to improve the state of individual services, create value propositions for complex socio-technical contexts, or even contribute to large-scale socio-technical transitions.

#### SERVICE DESIGNER

A person who either identifies as a service designer (through education), is titled as service designer (in their work), or applies predominantly service design methodology in their line of work.

#### POSITIONALITY

A service designer's social, political, and cultural location and context from which they view and relate to others and form opinions and beliefs about their reality. By declaring their positionality, designers understand what shapes their worldviews.

#### EXPERT

A person who is contributing with their knowledge (obtained through education or experience) to the process of this thesis.

#### LARGE-SCALE TRANSITIONS

Reconfigurations of the current political, cultural, and socio-economical systems with the aim of achieving sustainable and equitable futures.

# Consumption

#### SUSTAINABILITY

A broad and ill-defined concept that assumes a conscious and responsible mindset in which future generations co-exist in a balanced relationship with surrounding ecosystems. However, the concept can gravitate to extreme forms of ecological conservation and nature stewardship but also toward its technocratic and ecomodernist interpretation.

#### SUSTAINABLE DEVELOPMENT

A widely-accepted approach proposed in the Brundtland Report (1987) and calling for a global development that allows both present and future generations to meet their needs.

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A widely-accepted approach proposed in the Brundtland Report (1987) and calling for a global development that allows both present and future generations to meet their needs.

#### **PRODUCTION-CONSUMPTION SYSTEMS**

Complex structures that exist on various levels (e.g., communal, local, national, global). While production consumes natural resources alongside human and machine labour, consumption focuses on the use of products and services. However, both systems are connected and influence each other. Nowadays, both production and consumption (especially in the Global North) are resource- and carbon-intensive, and, as a result, unsustainable.

#### CONSUMPTION

A component of using products and services in a variety of everyday contexts. Therefore, consumption is understood beyond its narrow meaning of an act of purchase or as a token for over-consuming cultures. Instead, consumption is viewed as part of product and service appropriation, use, and discontinuation or disposal.

#### CONSUMER

A person who carries out and engages in any type of consumption.

#### PRACTICE(S)

A routinised and habitual flow(s) of doing embedded in people's everyday life. Practice(s) can range from simple (e.g., making tea) to complex (e.g., driving a car) or from covering domestic (e.g., cooking and cleaning) to work-related activities (e.g., going to work).

#### SUSTAINABILITY

A broad and ill-defined concept that assumes a conscious and responsible mindset in which future generations co-exist in a balanced relationship with surrounding ecosystems. However, the concept can gravitate to extreme forms of ecological conservation and nature stewardship but also toward its technocratic and ecomodernist interpretation.

#### SUSTAINABLE CONSUMPTION

A component of using products and services that cover one's needs while eliminating demands for natural resources and reducing waste.

#### **CIRCULAR ECONOMY**

An alternative economic model to the existing linear economy that promotes a closed-loop approach to retain the value of resources and materials and avoid waste generation.

#### CIRCULARITY

A term referring to circle-like flows of resources, materials, products and services that lead to continuous value retention and eliminate waste.

#### **CIRCULAR SOCIEITY**

An extended view of a circular economy that applies social, political, and cultural paradigm shifts to devise new social norms and structures that, besides circular production and manufacturing, promote circular thinking, doing, and living.

#### **CIRCULAR CONSUMPTION**

A component of using products and services in a way that leads to value retention and waste elimination through practices like reduction, reusing, repair, refurbishing, or recycling.

#### **CIRCULAR CONSUMPTION PRACTICE(S)**

A routinised and habitual flow(s) of doing embedded in people's everyday life that lead to value-retention approach to products and services and waste elimination.

#### **CONSUMPTION WORK**

A type of labour people must perform to obtain, use, or dispose of products and services.

#### **CIRCULAR CONSUMPTION WORK**

A type of labour people must perform to contribute to continuous value retention of circular products and services and to prevent waste generation.

# Gender

#### SEX

A set of female or male bodily characteristics such as genitals or genetics.

#### GENDER

A social factor that is construed through an interplay of social and cultural aspects installed through the process of socialisation and often associated with normative views of femininity and masculinity.

#### **GENDER ROLE**

A socially constructed set of ideas and beliefs about one's private and public behaviours, traits, or appearances formed on the basis of their biological sex.

#### **GENDER BIAS(ES)**

A type of reasoning or action that stems from prejudices about men and women as two unequal social groups.

#### **GENDER STEREOTYPES**

A set of generalised or preconceived ideas and views on what is perceived as behaviours, differences, attributes, or roles typical for women and men. For example, the idea that women are naturally caring and motherly or that men are naturally better in science and sports.

#### WOMAN

A person who identifies as a woman, regardless of her biological sex.

#### MAN

A person who identifies as a man, regardless of his biological sex.

#### **OTHER GENDER IDENTITIES, OTHER GENDERS**

An umbrella term for gender identities other than women and men, including, for example, nonbinary, genderfluid, or non-gender.

#### INTERSECTIONALITY

A concept to drive understanding of the complex interplay of several factors and dimensions that impact one's experience of themselves, other people, and the world at large.

#### **GENDER EQUALITY**

A state of equal access to rights, opportunities, and responsibilities irrespective of one's gender.

#### **GENDER EQUITY**

A state of equal access and rights, irrespective of one's gender, is achieved through a fair distribution of resources and opportunities.

#### GENDER JUSTICE

A state ensuring gender equality and equity, irrespective of one's gender, throughout and across entire political, legal, financial, social, and cultural systems.

#### **GENDER SENSITIVITY**

An active process of recognising gender as a social factor which impacts one's private and public life. By being gender-sensitive, one becomes aware of gendered experiences and discourses and starts taking action toward gender equality, equity, and justice.

# Discovered and used abbreviations

- **AAU -** Aalborg University
- **SD** Service Design
- **SD** Sustainable Development
- **SDG(s)** Sustainable Development Goal(s)
- **GHG** Greenhouse gas (emissions)
- **CE -** Circular Economy
- **CS** Circular Society

# **IV. Table of contents**

I. Abstract	3
II. Acknowledgments	4
III. Key terminology and abbreviations	5
IV. Table of contents	7
V. Overview of tables and figures	12
1. Introduction	15
1.1 Thesis motivation and aim	15
1.2. Learning objectives	15
1.3. Reading guide	16
1.4 Delimitations and ethical considerations	18
2. Literature Review	18
2.1 Methodology	21
2.2. Service design	21
2.3 Sustainability and sustainable consumption	26
2.4. Gender and its role in design	32
2.5. Summary of findings	37
2.6 Focus and research questions	37
3. Project Context	
3.1 Introduction	41
3.2 Linear economy	41
3.3 Circular economy	43
3.4 Circular economy and gender	50
3.5. Service desian and circular economy	51
3.6 Practitioner survey	55
3.7 Expert Interviews	59
3.8 Initial problem statement	62
4. Methodology	
4.1. Framework for Innovation	65
5. Discover	
5.1 Introduction	69
5.2 Desk research	69
5.3 Online content analysis	76
5.4 Survey	84
5.5 Interviews	91
5.6 Conclusions of the Discover phase	101
6. Define	
6.1 Introduction	103
6.2 Key findings	103
6.3 Expert interviews	107
6.4 Mapping problem space	112
6.5 Refined problem statement	113
6.6 Conclusions of the Define phase	113
7. Between the Diamonds	

7.1. Motivation behind the design experiment

7

<ul><li>7.2. Materials and structure</li><li>7.3. Reflections on the experiment</li></ul>	115 117
7.4. Experiment findings	117
7.5 Final reflections	120
8. Develop	
8.1 Introduction	123
8.2 Initial ideation	123
8.3 Review of existing resources and tools	125
8.4 Expert interviews	129
8.5 Design reflections and initial principles	133
8.6 Concept idea development	136
8.7 Expert feedback	138
8.8 Conclusion of the Develop chapter	140
9. Deliver	
9.1 Introduction	143
9.2 Concept development	143
9.3 First testing	151
9.4 Prototype iteration	153
9.5. Peer feedback	154
9.6 Prototype iteration	155
9.7 Second testing	155
9.8 Final feedback	157
9.9. Final concept	159
9.10 Conclusions from the Deliver chapter	163
10. Discussion and Conclusions	
10.1 Introduction	165
10.2 Reflections on gender as a factor in service design	165
10.3 Reflections on circularity as new area for service design	166
10.4 Reflections on service design's role in change	166
10.5 Conclusions	167

# 11. References

12.Appendix

# V. Overview of tables and figures

# TABLES

- Table 1. Examples of keywords used in the literature search
- Table 2. An overview of selected service design definitions
- Table 3. A short overview of selected sustainability definitions
- Table 4. Overview of reviewed resources and toolkits
- Table 5. An overview of the recruited academic and non-academic professionals
- Table 6. Overview of commonly mentioned circular consumption strategies and practices aimed at citizens
- Table 7. Overview of search words used for online content analysis
- Table 8. An overview of prompts used for AI text generation
- Table 9. Overview of recruited interview participants
- Table 10. An overview of the recruited service designers and other experts
- Table 11. Overview of the reviewed tools and resources
- Table 12. Overview of the recruited service designers and other design experts
- Table 13. Overview of the key findings from the Develop phase
- Table 14. Overview of the initial design principles
- Table 15. Overview of the recruited service designers and other design experts
- Table 16. Two clusters of identity markers
- Table 17. Conceptual clusters of themes within Positionality cards
- Table 18. Project-related questions used in Project context cards.
- Table 19. Overview of the selected circular practices for which we developed Practice cards
- Table 20. Overview of the recruited test participants.
- Table 21. Overview of participants in the peer feedback
- Table 22. Overview of the recruited test participants.
- Table 23. Overview of recruited service designers and other experts
- Table 24. Evaluation of the final solution against the design principles

# **FIGURES**

- Figure 1. Transition Design Framework
- Figure 2. Three common visualisations of sustainability dimensions
- Figure 3. SDGs' wedding cake' visualisation showing the interconnected view of SDGs
- Figure 4. A visual depiction of the terms inequality, equality, equity, and justice
- Figure 5. Examples of headlines with female designers
- Figure 6. Examples of digital and community projects focusing on women in design
- Figure 7. The fifth and twelfth SDG
- Figure 8. A schematic depiction of a linear economy.
- Figure 9. Schematic visualisation of a Cradle-to-Cradle framework
- Figure 10. The 'Butterfly' model of CE
- Figure 11. The overview of 9Rs framework
- Figure 12. A compilation of existing and marketed circular solutions developed by known businesses or initiatives
- Figure 13. The difference between Circular Economy (CE) and Circular Society (CS)
- Figure 14. Visual representation of the four circularity discourse categories
- Figure 15. The group's circular society mindmap
- Figure 16. Schematic representation of PSS continuum
- Figure 17. Design Council's Framework for Innovation
- Figure 18. Schematic overview of the roles associated with circular citizens
- Figure 19. Sustainable consumption matrix
- Figure 20. A compilation of images collected during desk research into non-scholarly sources on sustainable consumption
- Figure 21. Examples of Google search for sustainable products and a thumbnail of a video essay discussing the eco-gender gap
- Figure 22. Combining our research wall with digital Miro analysis in SurveyXact and Miro
- Figure 23. Schematic overview of the key elements of social practices
- Figure 24. Schematic overview of the key elements of social practices
- Figure 25. An example of insights clusters created during sense-making sessions
- Figure 26. A Venn diagram indicating the thesis problem space
- Figure 27. Examples of the future scenarios
- Figure 28. Image documentation of the design experiment
- Figure 29. Examples of practices, rated on a desirability scale
- Figure 30. Examples of messages on the postcards from the future
- Figure 31. Images from the reviewed resources and tools.
- Figure 32. Overview of the 'Three pillars' concept idea.
- Figure 33. Examples of the 'Provocation' cards.
- Figure 34. Examples of Practice cards
- Figure 35. Template for entering concrete activities to design in a gender-sensitive manner.
- Figure 36. Sample of identity marker cards and "fill in your own" identity marker card
- Figure 37. Sample of Positionality cards
- Figure 38. Sample of Project context cards
- Figure 39. Sample of Consumption cards
- Figure 40. Sample of Practice cards
- Figure 41. Sample of Practice cards
- Figure 42. New template for guided gender sensitivity
- Figure 43. Overview of the final concept template for guided gender sensitivity

# 1. INTRODUCTION

1.1 Thesis motivation and aim1.2. Learning objectives1.3 Reading guide1.4 Delimitations and ethical considerations

# 1. Introduction

# 1.1 Thesis motivation and aim

# 1.1.1 Thesis motivation

The topics of sustainability and circular economy have gained significant traction across academia and in design practice. This shift toward sustainability can be attributed to the increasing number of designers who are either considering or being asked to consider the social and environmental impact of their design solutions (e.g., Design Council, 2021). However, despite this positive trend, several scholars (e.g., Prendeville and Bocken, 2017; Sierra-Pérez et al., 2021; Villari, 2022) pointed out that the involvement of service design in sustainability topics remains relatively new. Therefore, with this thesis, we aim to add to the growing field of sustainable service design, focusing mainly on the role of service design in imagining and designing transitions toward circular ways of living and doing. While service design has considerable transitional potential for designing better services, social structures, and business models (e.g., Sangiorgi, 2011; Holmlid & Wetter-Edman, 2021), any change comes with its challenges and risks. Our Master's studies have highlighted the importance of critically examining possible biases, privileges, and stereotypes affecting our worldview. Therefore, we ask ourselves - In light of the increasingly popular circular economy, what challenges do we believe our thesis can help to uncover, examine, and contribute to solving? Inspired by publications such as Data Feminism or Invisible Women, we will investigate how gender shapes sustainable consumption and how gender perspective, or more precisely, the lack of it, impacts the design of sustainable services and service systems. To do so, we will embark on a research journey during which we will dedicate a significant amount of time to understanding various concepts (e.g., sustainable consumption, circular economy, gender) and extending these further with the insights gathered through interviews with service designers and experts (see Appendix 1 for their full overview). At the same time, we will be turning these insights into a design solution developed via collaborative ideation sessions and several rounds of testing.

# 1.1.2 Thesis aim

The aim of this thesis is to support service designers in adopting a gender-sensitive approach, especially within the context of a circular economy. As the transition toward more sustainable and circular ways of consuming is becoming increasingly urgent, ensuring a gender-sensitive design process will enable service designers to devise solutions that are not only sustainable but also inclusive and equitable.

By focusing the outcome of our thesis on service designers, we hope to leverage their capacity to affect change while staying aware of the limits of their power. Therefore, our **"Circular Gender Lens"** toolkit expands the gender perspective beyond end-users and also considers design teams and project contexts. By doing so, we hope to foster a more comprehensive and holistic approach to gender-sensitive circular design.

How can we foster gender sensitivity among service designers, in the context of designing circular consumption services?

# 1.2. Learning objectives

In this section, we will briefly present two sets of learning objectives consisting of both the official learning outcomes established by Aalborg University and our learning aspirations and goals. While the official learning objectives aim to demonstrate the essential competencies, skills, and knowledge required of graduating service system designers, our personal goals and aspirations provide insight into our interests and wishes of how we envisioned our thesis to contribute to service design as a research area and practice.

# 1.2.1 Selected official learning objectives

From the official learning objectives provided by Aalborg University (2020), we selected the following requirements to exemplify the expected level of knowledge, skills, and competencies tied to the final semester of the master's program in Service Systems Design:

# Knowledge

- Must have knowledge about the possibilities to apply appropriate methodological approaches to specific study areas.
- Must have knowledge about design theories and methods that focus on the design of advanced and complex product-service systems.
- Describe the state of the art of relevant research in the specialisation.

#### Skills

- Must be able to work independently, to identify major problem areas (analysis) and adequately address problems and opportunities (synthesis).
- Must demonstrate the capability of analysing, designing and representing innovative solutions.
- Must demonstrate the ability to evaluate and address (synthesis) major organisational and business issues emerging in the design of a product-service system.
- Master the scientific methods and general skills associated with the specialisation.

#### Competences

- Must be able to master design and development work in situations that are complex, unpredictable and require new solutions (synthesis).
- Must be able to independently initiate and implement discipline-specific and interdisciplinary cooperation and assume professional responsibility (synthesis).
- Must have the capability to independently take responsibility for own professional development and specialisation (synthesis).
- Participate in, and independently carry out, technological development and research, and apply scientific methods in solving complex problems.

# 1.2.2 Selected personal learning objectives

Besides the official learning objective, we also agreed on a set of mutual aspirations and personal goals for the thesis aim, process, and outcomes:

- Gain a deeper understanding of the circular economy and mainly circular consumption practices. Consult service designers and other experts to understand how these practices are designed and considered.
- Gain a more nuanced understanding of gender and its role in design. Engage with service designers and other experts to understand barriers and experiences of applying a gender perspective in design research and practice.
- Open a discussion about gender in service design while staying non-judgmental and curious.
- Come up with a solution that inspires, empowers, and supports service design (or other members of innovation and design teams) to consider gender as an important factor when researching, designing, or advocating for future forms of consumption.
- Challenge ourselves to develop a tool that 'makes sense'. In other words, we aimed to create an outcome that fits into the everyday reality of service designers.
- Engage in a complex, challenging, and highly politicised topic while having fun.

# 1.3 Reading guide

To help readers navigate our thesis, we included a short reading guide briefly introducing each chapter. We recommend that readers refer to this guide to create a quick but comprehensive understanding of the thesis's structure and the key messages behind individual chapters.

# Chapter 2 - Literature review

Chapter 2 contains a literature review that sets the theoretical foundation for this thesis and provides the necessary context for formulating the research question. The chapter covers several key themes, starting with a focus on service design and exploring its history, various definitions, and its capacity to bring about change. Furthermore, the chapter touches upon the topic of sustainability, a matter of utmost importance in today's design discourse, before narrowing it down to introducing sustainable consumption. Moreover, the chapter highlights the current challenges in addressing social differences in design theory and practice, focusing primarily on gender. Finally, the chapter concludes with the key literature review findings followed by a research question that will guide our further investigation of the complex interplay between service design, gender, and circular consumption practices.

# Chapter 3 - Project context

Chapter 3 introduces the concept of circular economy (CE), which serves as a context for this thesis. The chapter begins with a general introduction to the currently dominant concept of a linear economy and its shortcomings, followed by the idea of a circular economy and its key frameworks. The chapter also discusses the barriers to CE implementation, paying closer attention to the missing focus on the social dimension of circular solutions. The second half of the chapter will narrow our focus on the role of gender and service design in the circular economy, investigating relevant design competencies and tools. Finally, the chapter presents our initial problem statement, which will guide the research process in the Discover and Define chapters.

## Chapter 4 - Methodology

Chapter 4 introduces the methodological approach that will be used in this thesis and which is operationalized through Design Council's Framework for Innovation (n.d.).

# Chapter 5 - Discover

Chapter 5 represents a broad research approach toward understanding the dynamics between circular consumption and gender. The topics are first explored through academic and non-academic sources, including social media and Algenerated content. Following that, the chapter presents findings from a survey and a series of semi-structured interviews.

# Chapter 6 - Define

Chapter 6 aims at synthesising research findings, deriving main themes, and searching for recurring patterns. Following the sense-making process and its outcomes, the chapter describes findings from expert interviews and concludes with defining the thesis' problem space and presenting a refined problem statement.

# Chapter 7 - Between the diamond

Chapter 7 is a short chapter describing a design experiment conducted in between the Define and Develop design phases. The chapter introduces the rationale behind the experiment and its setup, followed by the analysis of its findings.

# **Chapter 8 - Develop**

Chapter 8 introduces the Develop phase, characterised by free and creative ideation of concept ideas and translation of those into first tangible concepts. First, the chapter starts with a broad ideation based on a review of existing resources and tools, followed by several expert interviews. Next, the chapter introduces the main principles used to develop the first concept idea, followed by the idea's evaluation in two expert sessions.

# **Chapter 9 - Deliver**

Chapter 9 presents the last design phase, which focuses on prototyping and testing a design concept, leading to the final design solution. This chapter includes concept development, testing workshops, and feedback sessions that will facilitate multiple iterations of the prototype before its finalisation. The chapter then introduces the "Circular Gender Lens" toolkit.

# Chapter 10 - Discussion and conclusions

Chapter 10 concludes the design process by engaging in multiple reflections addressing the problem statements, design process, and the thesis outcome.

#### 1.4 Delimitations and ethical considerations

Finally, we will briefly discuss several research delimitations and introduce any ethical considerations we were aware of when researching, working on, and writing this thesis.

#### 1.4.1 Important delimitations

Setting and agreeing on clear delimitations is important as any academic research or design project will be naturally limited in its scope. While scope details describe the focus of the research or design project (e.g., target population, variable, budgets, or project duration), delimitations refer to variables outside the scope (The AJE team, 2022). The good news is that delimitations are within the control of researchers and designers, as they can also be set proactively to avoid having unachievable research or project objectives (Theofanidis & Fountouki, 2018). When embarking on this thesis, we identified the following delimitations:

#### **Project duration**

The thesis scope is inherently affected by the allocated thesis period, starting at the beginning of February 2023 and ending in mid-May 2023. This period must also accommodate both the theoretical and practical thesis work, leading to the development of two thesis deliveries, including this report and a short design outcome report. Therefore, the thesis period and requirements connected to it pose natural boundaries for the scope and extent of the thesis.

#### **Official learning objectives**

The theoretical and practical thesis work is also shaped by the official learning objectives imposed by the AAU. In practice, these objectives limit the thesis scope by expecting a certain thesis structure, process, and activities which may or may not always be compatible with the needs, wishes, or interests experienced by the thesis team.

#### **Team size**

The size of a thesis team limits the research and design activities that could be performed during the stages of research, design, testing and finally documenting. As we were only two students, our thesis outcomes were naturally limited by the workload and resources available to us.

#### Budget

As students working on a non-funded thesis project, we primarily used our limited budget to purchase office supplies, get refreshments for our participants, and print materials used during testing and workshops.

#### **Participant recruitment**

Without a recruitment budget, we relied heavily on recruiting participants for our surveys, interviews, and testing through social media and private networks. This recruitment approach means that our research is limited by convenience sampling.

#### Target audience

The focus of the final solutions is primarily on discovering biases and stereotypes linked to consumption typical for women and men, although we are aware of the existence of the fluid and plural nature of gender (i.e., not limited to the binary view on women and men).

## 1.4.2 Ethical considerations

The thesis follows the ethical recommendations and rules for GDPR required by AAU. This means that all participants, regardless of the thesis activity (e.g., interviews or surveys), were informed about the way we handled and used the collected data upon providing their consent to participate in our research.

Given the complexity and sensitivity of the gender topic, we restrained ourselves from any form of judgement when discussing ways people understand, experience, or reason about gender in their private or professional life. Furthermore, as many interviewed experts worked in design teams and organisations, we asked them not to disclose any information about their past or existing projects and tasks that they would not feel safe or did not have permission to discuss. Finally, we always strived to be on time, respect the agreed-upon length of each session, and made ourselves available in case participants wanted to share their thoughts through different media (e.g., via email).

# 2. LITERATURE REVIEW

The following chapter contains a literature review that lays the broad theoretical foundations of this thesis and provides context for the research question. The chapter begins with exploring service design as a discipline, reflecting on its history, current role, and variety of existing definitions. This introduction will be followed by a short discussion on the transitional potential of service design and a critical reflection on emerging disciplines like Transition Design. Furthermore, the literature review will introduce the concept of sustainability, one of today's most critical topics, before it zooms in on sustainable consumption. Here, the review will explore the role of design in shaping consumption and highlight the current challenges in paying attention to social differences, especially gender. The complex concept of gender and its relevance for design will be the focus of the last portion of this review.

To conclude this chapter, we will frame the thesis context of a circular economy by introducing a research question that will help us examine the role of service design in shaping circular consumption practices.

This chapter consists of the following sections:

- 2.1 Methodology
- 2.2 Service design
- 2.3 Sustainability and sustainable consumption
- 2.4 Gender and its role in design
- 2.5. Summary of findings
- 2.6 Focus and research questions

# 2.1 Methodology

The literature review will introduce three key themes constituting the theoretical groundwork for the thesis. These themes are Service design, Sustainability and sustainable consumption, and Gender. To help us navigate the extensive body of multi-disciplinary research dedicated to each of the themes, the literature review was structured to seek answers and reflect on the following research questions:

- What are the fundamental principles of service design, and what role does service design play in large socio-technical transitions?
- What is consumption, and how does design contribute to the transitions toward more sustainable consumption practices?
- What is gender, and which role does gender play in design? How is gender perspective currently reflected in design education and practice?

In order to effectively answer the identified research questions, we conducted desk research to introduce readers to the fundamental concepts of this thesis. We utilised two research engines to help us locate relevant literature that met the research criteria (e.g., peer-reviewed literature) and contained the required keywords (see Table 1 for examples). To begin, we used Google Scholar to gain a broader overview based on the entered keywords. Following that, we used Aalborg University's (AAU) library system (Primo) for further filtering options and to get access to research articles and publications. The searches were not limited to specific publication years. Nonetheless, since research into service design and design-led interventions in sustainable consumption is a relatively recent field, the majority of the reviewed literature was published in the last two decades.

Review focus	Examples of keywords
Service design	'Service design', 'definitions of service design', 'service design and transitions', 'transition design', 'reflexivity in service design'
Sustainability and sustainable consumption	'Sustainability', 'Dimensions of sustainability', 'Consumption', 'Consumption and design', 'Sustainable consumption,, Sustainable consumption and design'
Gender and its role in design	'Definitions of gender', 'gender theory', 'intersectionality', 'design in design', 'gender roles in design', 'gender biases'

Table 1. Examples of keywords used in the literature search

# 2.2. Service design

## 2.2.1 The history of service design

Services, as a form of organised help and mutual exchange, have a long history as they have always existed within social groups and structures. However, after industrialisation, numerous manual services were replaced by innovative technological advancements, and the advent of industrial design in the 1920s further solidified the primary focus on the production and consumption of consumer goods (Pollaine et al., 2013; Holmlid & Wetter-Edman, 2021). While services remained essential in certain areas like care or entertainment, the economic focus shifted toward promoting the value of manufactured products (Holmlid & Wetter-Edman, 2021). Under this goods-dominant logic, services functioned as mere facilitation tools for the transportation, assembly, or promotion and sale of products (Martin, 1999).

However, following World War II, this perspective began to change as the consumption needs of industrialised societies, especially in the West, became gradually saturated, and manufacturers found themselves operating in an increasingly competitive market (Martin, 1999; Pollaine et al., 2013). Therefore, in an attempt to differentiate their offerings, manufacturers began considering services as a way to improve their interaction with customers (e.g., through product demonstrations, free delivery, or customer support lines) (Martin, 1999). Nonetheless, the shift from designing products to orchestrating services proved challenging, as services were initially conceptualised as no different from products (Holmlid & Wetter-Edman, 2021). In 1982, Lynn Shostack challenged this prevailing but narrow viewpoint on services by stating that, compared to products, services have unique qualities and must be, therefore, appropriately designed (Holmlid & Wetter-Edman, 2021; Morelli, de Götzen & Simeone, 2021).

Coming from the marketing field, Shostack recognised the need for professionally designing the components of a service by outlining all the elements and actions that contribute to a service experience. By introducing her approach under the term 'service blueprint,' Shostack marked the beginning of service design (Vink et al., 2017). However, it would take another decade for service design to be recognised as a new design discipline (Interaction Design Foundation, 2021).

Nowadays, service design represents a more mature field, practised by various professionals and taught in courses or stand-alone programs at several universities (Penin, 2018). Moreover, operating within an increasingly serviceoriented economy, the foundation for understanding the nature of services has also shifted. Instead of being defined based on their differences from products, as previously proposed by Shostack and her successors, the current paradigm follows a service-dominant logic. This means that services and goods are not perceived as separate or opposite entities but rather as integrated components within customised propositions aimed at customers. In this approach, customers are not passive consumers of value (i.e., destroying value through the use of a product) but instead actively contribute to its creation as co-producers (Vargo & Lusch, 2014). This paradigmatic shift has also expanded the focus of service design, extending it from the design and implementation of single services (i.e., 'design of service' or 'services as interaction') to dealing with value-creation processes in more complex sociomaterial contexts (i.e., 'design for service' or "services as infrastructures') and even driving transitions within large socio-technical ecosystems (i.e., 'design of service systems' or 'services as a systemic institution') where value is coproduced by numerous actors (Vink et al., 2020; Holmlid & Wetter-Edman, 2021; Morelli, de Götzen & Simeone, 2021). Lastly, the expanded scope of service design invites us to rethink the possible outcomes of the service design process. While the initial view of service design (i.e., 'design of service' or 'services as interaction') understood the outcomes in terms of meeting customer needs through delivering new or improved service offerings, the modern approach requires a broader perspective in which the outcomes are also measured through the value and learnings generated during participatory and collaborative design processes (Vink et al., 2020).

## 2.2.2 Service design definition and key principles

Despite nearly four decades of service design development, no standardised and widely accepted definition of the discipline exists. However, as the popularity of service design is on the rise, there is a growing need to find a common theoretical ground to advance service design research and create a more comprehensive professional profile of service design practitioners (Nisula, 2013; Morelli, de Götzen & Simeone, 2021).

For the purpose of this literature review, we collected a small sample of the existing definitions published in academic journals, practitioner guides, or formulated by service design experts and organisations (see Table 2 for selected examples). This theoretical exercise helped us reflect on the similarities and possible differences between the definitions, suggesting that the meaning of service design continues to evolve and remains negotiated in various formal (e.g., academic journals) and informal (e.g., podcasts) arenas. For example, many authors seemed to acknowledge service design's multi-disciplinary and co-creative nature, applied both within a narrower organisational or broader societal setting. Similarly, most definitions mentioned the importance of analytical skills and capabilities (e.g., in understanding various needs) coupled with innovative and creative approaches toward problem-solving (e.g., Sun, Jenkins & Liu, 2022). However, while some mentioned innovative service offerings as the outcomes of the service design process (Stickdorn et al., 2018; Antrop, n.d.), others (e.g., Holmlid & Evenson, 2008) put greater emphasis on observations and learnings from the ways participatory methods model and influence the performance of possible service deliveries.

Table 2. An overview of selected service design definitions

Selected definitions	Source
"Service design is a practical approach to the creation and improvement of the offerings made by organizations [] It is a human-centered collaborative, interdisciplinary, iterative approach which uses research, prototyping, and a set of easily understood activities and visualisation tools to create and orchestrate experiences that meet the needs of the business, the user, and other stakeholders" (Stickdorn et al., 2018, p. 27).	(Stickdorn et al., 2018, p. 27).
"Service design positions itself as an integrative form of design that dialogues both with the material practices of design and with the strategic and system-oriented approaches [] Because service design combines analytical and creative capabilities, it allows people with different sets of skills to contribute in service design projects."	(Penin, 2018, p. 147).

"Service design is a multidisciplinary field that involves marketing, human resources, operations, organizational structure, and technology disciplines [] Following this holistic approach, service design orchestrates service elements such as the physical environment, people (customers and employees), and service delivery process to help customers co-create their desired experiences."	(Teixeira et al., 2012, p363)
"[] service design is concerned with systematically applying design methodology and principles to the design of services [] (Service design) assumes the customer/user as the starting point or lens into a specific service and through the use of creative, human-centered and user-participatory methods models how the service can be performed. At the same time, service design integrates the possibilities and means to perform a service with the desired qualities, within the economic and strategic intent of an organisation."	(Holmlid & Evenson, 2008, p341).
"Service design is a process where designers create sustainable solutions and optimal experiences for both customers in unique contexts and any service providers involved. Designers break services into sections and adapt fine-tuned solutions to suit all users' needs in context—based on actors, location and other factors."	(Interaction Design Foundation, n.d., para 1)
"Service design is everything people experience when encountering or using a service, from its website, booking app and social media platforms, for example, to the actual service delivery in its physical environment, contact with staff and beyond. The best service designs create a user journey that fulfils people's needs and presents everything to do with that service as one brilliant interconnected whole."	(EGGS, n.d., para 1)
"Service design is a form of customer-driven business development – a way to generate innovation and produce user-friendly, competitive services."	(Antrop, n.d., para 1)
"Service design is an activity about making predictions about the future. The design itself will emerge in usage. In order to predict the future, we need to gather as much knowledge as we can through insight and research. And sometimes, we just need to take a chance, state a hypothesis and then validate it in an environment with low risk. Our role, apart from emphasising, is to facilitate the understanding be- tween the different stakeholders, including the customer. Where we act is dependent on our context, we can design a service, design for service, or, in even greater complexity, design for service ecosystems."	(Honeypot Podcast, 2022, 4:20)

Now, despite the challenge of coining a standardised definition of service design, the literature (e.g., Penin, 2018; Stickdorn et al., 2018; Sangiorgi & Prendiville, 2018; Holmlid & Wetter-Edman, 2021) agrees on several fundamental principles for designing services. These principles include, for example, adopting a human-centred perspective, utilising an iterative and participatory design process, and applying a holistic approach. While it is beyond the scope of this thesis to delve into each of these in great detail, we will provide only a brief overview of the three principles mentioned above:

- First, modern service design is a human-centred discipline that focuses on uncovering the needs of everyone involved in a service or service system (Stickdorn et al., 2018). However, as a consequence of the ongoing climate crisis, the importance of including non-human voices has become ever more present, leading to more designers adopting a more-than-human perspective within their processes (Tomitsch et al., 2021).
- Next, service design requires the involvement of various stakeholders through participatory or co-design
  practices (Penin, 2018). Departing from the understanding that people are experts on their experiences, service
  designers act as specialists in deploying various methods (e.g., interviews or ethnography) and strategies (e.g.,
  design games and experience) that could best bring those experiences forward in a creative and forwardthinking way.
- Finally, the principle of applying a holistic (i.e., systemic) perspective is crucial as service designers often deal with the needs of many stakeholders that must be designed into complex services or organisational processes (Penin, 2018). Moreover, by adopting a holistic perspective, service designers can better understand how different system components (e.g., actors, resources, policies, or information flows) interact, depend on, or influence each other to design more robust, inclusive, and sustainable services (Penin, 2018). Therefore, by becoming system thinkers, service designers are better equipped to deal with the complex and wicked issues of the 21st century (e.g., climate change, eroding democracies), which can no longer be addressed through the traditional creative processes (Jones & van Ael, 2022).

# REFLECTION

During the literature review, we wondered how the lack of a standardised definition and diverse focuses of academic (e.g., Becermen & Simeone, 2020) and non-academic training (e.g., service design boot camps, crash-courses, or practitioner books) affect designers' personal views on their role and abilities to practise design. More specifically, the difference between being a service designer (i.e., professional identity), having a service design role (i.e., title), and practising service design (i.e., proficiency in using service design tools and methods). Later in the project, several interviewed designers, especially those who transitioned to service design from other disciplines (e.g., industrial design or humanities), would often introduce themselves as 'not being a service designer' despite holding a service design role within their organisation.

According to an article by Downe (2022), this dissonance can be explained by the increased gatekeeping within the service design community. In the same piece, the author relativises the discipline, suggesting that neither education and previous experience nor the application of service design methodology qualifies as a requirement for a person to work as a service designer (Downe, 2022). This article is not unique but belongs to many similar texts, blog posts, and discussions dedicated to transitioning and finding jobs within service design.

While an open approach to service design can lead to democratisation and greater accessibility (e.g., by not requiring time-consuming and often costly academic training) of the discipline, it also poses several risks, such as weaker research into service design ethics. Given that service design is promoted and frequently deployed in domains like healthcare, education, or as a base methodology for projects involving marginalised groups, the lack of appropriate training might lead to insufficient, insensitive, or even dangerous design solutions. However, we did not find research articles that would directly engage in discussions on the discipline's academic and non-academic boundaries, minimal requirements, or the issues of gatekeeping.

#### 2.2.3 The transformative power of service design

For the final part of the literature review, we explored the relevance and opportunities for service design to contribute and assist with large-scale transitions, such as those required by the world's societies to tackle the ongoing climate crisis and adapt to inevitable climate changes (e.g., rising temperatures and sea levels).

Many scholars (e.g., Villari, 2002; Irwin, 2015; van Dam et al., 2020) agree that as a discipline and research field, design is crucial in promoting sustainable and equitable futures and could provide necessary tools to facilitate large-scale societal transitions. Within service design, this potential is visible through a noticeable change in how services are viewed. Instead of services being regarded as the sole and isolated outcomes of the design process (i.e., understanding services as interactions), they are now considered as a catalyst for achieving broader societal changes (Sangiorgi, 2011). Besides academic discourses, this appreciation of strategic qualities of service design is also apparent in promotional content on various service design studios' websites (e.g., in projects like Accessible Voting for All by EGGS design or Security and Support for Children and Young People by Antrop). However, the results of such primarily commercial projects often still lead to concrete service deliveries or a new touchpoint design (e.g., a website).

Recently, Irwin (2015) proposed establishing a new design discipline that would combine foresight with a thorough understanding of change theories and apply these under a more holistic mindset of collaboration and openness to new ideas. This new domain, named Transition Design, stems from service design and design for social innovation but critiques these, especially service design, for their locked-in position within the current economic system (see Figure 1). Unlike them, Transition Design argues to be better positioned to imagine radical futures, establish new paradigms, and achieve positive social change (Irwin, 2015). However, despite nearly a decade since its introduction, we could find only a small number of articles (e.g., Odabasi et al., 2022) addressing Transition Design or attempting to apply the framework onto real-world cases. This lack could be the result of the framework's shortcomings. According to Scupelli (2015), Transition Design places designers in the driver's seat of large-scale transitions, but it does not specify who these designers are and where they receive the mandate and influence to create such radical changes (Scupelli, 2015). Furthermore, transition designers should collaborate with many other disciplines, yet similarly to Downe (2022), transition designers do not need to be academically trained. Lastly, the connection between business transitions and Transition Design seems unclear, suggesting that Transition Design might eventually become part of a broader group of design-led transitions (Scupelli, 2015).



Figure 1. Transition Design Framework (Irwin, 2015, p232).

# REFLECTION

When researching the role of service design in large-scale transitions, we found ourselves repeatedly reflecting and debating the picture of service designers (and designers in general) as agents of change.

Although service designers seem to share this role with citizens and decision-makers (as proposed by Sangiorgi, 2011), it seems to be their capabilities to facilitate, unite, and speculate that, alongside the historical track of problem-solving mindset, make designers into professional change agents (Fleischmann, 2020).

However, to what extent can these skills and competencies lead to radically different realities, let alone new economic systems (e.g., circular economy)?

Moreover, to what extent can designers detach themselves from the very systems they try to change?

Sangiorgi (2011) argues that design literature has been overly optimistic when assessing the impact of design and must, therefore, engage with a more critical perspective while building a deeper understanding of transitional and change theories. By engaging in the practice of

reflection, service designers can explore and track ways to conduct transitions while paying attention to critical questions on the impact of their actions (e.g., who is left out, who is affected by the change, or who benefits from the transition) (Sangiorgi, 2011). We agree with Sangiorgi's (2011) perspective on the need for a greater focus on reflexivity and critical thinking in design practice. Although accepting the role of designers as change agents, we suggest that such a role is not categorical (i.e., one is or is not a change agent) or defined apriori (e.g., all designers are radical change makers) but instead acquired and cultivated through reflexive design practice and building a capacity to understand the complex dynamics of socio-technical systems and their change.

#### 2.3 Sustainability and sustainable consumption

The next portion of the literature review explores the concepts of sustainability and sustainable consumption. Before proceeding, it is essential to reiterate that this thesis focuses on designing sustainable consumption practices within a circular economy. Although sustainability and a circular economy share several similarities and are often used interchangeably, there are also several conceptual differences. For instance, while sustainability emphasises treating its three dimensions (i.e., environmental, social, and financial sustainability) equally, the circular economy has traditionally focused on environmental and financial transitions (Geissdoerfer, 2017).

However, as we will explore later (in Chapter 4), the numerous critiques of the circular economy have resulted in new focuses on its social dimension and began extending its focus from the narrow view of the economy to a broader idea of circular society (Calisto Friant et al., 2020; Clube & Tennant, 2023; Quintelier et al., 2023). Furthermore, the circular economy is often considered inevitable for achieving sustainable development (Kirchherr et al., 2017). Therefore, while acknowledging the potential conceptual differences, we have decided to briefly introduce sustainability in this literature review to provide more background for comprehending sustainable consumption and provide readers with more context for the upcoming chapters.

#### 2.3.1 Introducing sustainability

Sustainability is among the most crucial topics in today's global discourse, yet it is notorious for lacking a standard and widely-accepted definition (Washington, 2015). Introduced originally by the disciplines like biology and environmental science, the concept of sustainability has gradually entered the fields of economics, management, engineering, and business (Vos, 2007). Nowadays, there are over 300 working definitions of sustainability, many of which stem from the often-cited description of sustainable development that urges meeting *"the needs of the present without compromising the ability of future generations to meet their own needs."* (Washington, 2015, p21). However, the extent to which the idea of sustainable development should be considered synonymous with sustainability remains debated (Banerjee, 2003; Purvis & Robinson, 2018). For example, according to some scholars (e.g., Redclift, 2005; Washington, 2015), the term sustainable development (also referred to as sustainable growth) risks being an oxymoron as it still encourages continuous economic growth using the planet's finite resources - some of the very issues at the heart of the current climate crisis.

Although the lack of a standardised definition may lead to challenges with studying, implementing, and assessing sustainability, some scholars (e.g., Verweij et al., 2006; Walker & Shove, 2007) argue that the term's vagueness is the natural result of its dynamic nature and complexity. Therefore, opting for more straightforward and more flexible definitions might, in fact, help to achieve a broader consensus among diverse social groups or include multiple perspectives and policies (Vos, 2007; Odrowaz-Coates, 2021).

The origins of the word *sustainability* come from Latin 'sustinere', meaning to bear, endure, or hold up (Etymonline, n.d.) Merriam Webster (n.d.) defines *sustainability* as the ability to sustain or endure something.

As a comprehensive analysis of different sustainability definitions is beyond the scope of this literature review, the table below (Table 3) provides only a few examples of existing interpretations, from widely-accepted ones (e.g., Al-Athel et al., 1987) to more contemporary and indigenous formulations (e.g., Virtanen et al., 2020).

Source	Definition of sustainability
Al-Athel et al. (1987)	Sustainable development is development which meets the needs of current generations without compromis- ing the ability of future generations to meet their own needs.
Blincoe (2022, p11).	Sustainability is an all-encompassing construct. It is multi-dimensional, multi-disciplinary, transnational, transcultural and essentially holistic. It is the ultimate utopian model for a balanced world and one that can sustain human life for generations to come without destroying the biosphere and ecosystems.
Virtanen et al. (2020, p78)	Sustainability can be seen as the capacity of a certain community to create and maintain communal existence through the management of the local natural resources in a way that assures the survival and interconnectedness of the members of both the community and the environment.

Table 3. A short overview of selected sustainability definitions

# 2.3.2 History of sustainability

The following section briefly explores the history behind sustainability and concerns about the human impact on the environment. Although the solutions to the ongoing climate crisis lie in the future, learning about history provides designers with a valuable context for understanding the roots and socio-political background of the crisis we face today.

# 2.3.2.1 From Renaissance to Limits of growth

Since its underpinnings in the Renaissance, the relationship between humans and nature has been shaped by the anthropocentric worldview in which nature became an object of scientific studies and an endless stream of resources supporting the economics of the first nation-states. Although Romanticism and authors like Thoreau famously challenged this utilitarian view of nature, it was not until the 1960s that the first serious concerns regarding the human impact on the environment began to occur (Washington, 2015). For example, in 1962, marine biologist Rachel Carson published the ground-breaking book Silent Spring, which pointed out the negative consequences and environmental harm caused by DDT (dichlorodiphenyltrichloroethane) in agriculture (Dunn, 2012). A decade later, a group of young scholars at MIT (Massachusetts Institute for Technology) applied forecasting and simulation methods to predict the impact that the growing population size and existing production-consumption systems would have on nature and its resources by the end of 2100s (Vezzoli et al., 2021) The results, published in the book Limits to Growth, served as an important input before the first UN (United Nations) environmental summit in Stockholm (also in 1972) as it exposed the impossibility of endless extraction and consumption of the limited and finite planet's natural resources (Rockström et al., 2023). Although the conference resulted only in a recommendation-based action plan, it made discussions about environmental issues <u>political</u> on both local and international levels (Washington, 2015).

# 2.3.2.2 Sustainable development and Sustainable Development Goals (SDGs)

The term sustainable development was first introduced in the Brundtland Report' Our Common Future' in 1987 and attempted to address the growing inequalities between the resource-demanding countries in the developed Global North and developing countries in the Global South (Borowy, 2017). However, the consequences of navigating their different needs (while looking for strategies to support environmentally-conscious economic growth) have led to a rather vague definition of sustainable development (SD) as a "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (Washington, 2015, p21). Despite its vagueness, the report called for significant transitions to new mindsets and arrangements in both the public and private sectors. If implemented, it would have likely led to a different world today (Borowy, 2017).

Nevertheless, the concept of SD achieved what the previous efforts did not - it gained massive wide-world popularity (Mensah, 2019). As a result, the Brundtland Report was shortly followed by further summits and conferences (e.g., Earth Summit in 1992, The Earth Charter in 2000, Johannesburg Summit in 2002, or Rio+20 Summit in 2012, Copenhagen climate conference in 2009), some of which resulted in various binding (e.g., the Kyoto Protocol) and non-binding international agreements and treaties (e.g., The Future We Want) while others were criticised for their lack of action and overly or underwhelming ambitious targets (Washington, 2015; Ekard, 2020).

Besides laying the foundation of SD, the Brundtland Report's focus on inter-generational needs led to their

categorisation into three dimensions: social, economic, and environmental, often visualised as intersecting or supporting each other to highlight their close connection (Purvis & Robinson, 2018; Mensah, 2019) (Figure 2). In the business world, the idea of measuring and accounting for organisations' economic, social, and environmental impact was popularised with the term 'Triple bottom line', introduced by John Elkington in 1998 (Slapper & Hall, 2011).



Figure 2. Three common visualisations of sustainability dimensions (Purvis and Robinson, 2018, p682).

To support the SD agenda, the UN introduced the first set of recommended goals and targets, called Millenium Development Goals (MDGs), in 2000. The goals focused primarily on solving the issues of social inequality, lack of education, and poverty in the Global South (Fukuda-Parr, 2016). According to the UN, achieving those goals by 2015 would inevitably strengthen global collaboration and contribute to environmental protection (Evans, 2012). Although the MDGs were regrettably not met, the targets were implemented in a new set of legally non-binding Sustainable Development Goals (SDGs) introduced in 2015 as part of Agenda 2030. Driven by the worsening climate situation and the need for a more sustainable global development trajectory, SDGs also become relevant to the developed countries in the Global North (Sachs, 2012) (Figure 3).



Figure 3. SDGs 'wedding cake' visualisation showing the interconnected view of SDGs (Stockholms Resilience Centre, 2016, para1)

Shortly after, following governments and businesses, the SDGs were recognized and adopted by designers. For example, the Oslo Manifesto (published in 2016 following the Forward Thinking Design conference in Oslo) encouraged designers to actively incorporate SDGs in all stages of their design work (DMI Review staff, 2018).

#### 2.3.2.3 The aftermath of Paris Agreement

In 2015, the UN nations accepted the Paris Agreement, a new legally binding climate protection treaty. According to the agreement, the UN nations should financially support developing countries in their efforts to prepare for and mitigate the impacts of the changing climate (UN, n.d.). At the same time, the developed (i.e. industrialised) countries must bear the main responsibility in taking action to reduce greenhouse gas (GHG) emissions and keep the global warming temperature increase at 1.5°C, or well below 2 °C. (Ekard, 2020).

While staying within the range required by the Paris Agreement is necessary, it requires fast and extensive largescale transitions from the existing GHG-intensive production-consumption systems to new, low-carbon ones (Welch & Southerton, 2019). However, the amount of global anthropogenic (i.e., produced by human activity) GHG emissions has steadily been rising. Even the decline caused by the Covid-19 pandemic in 2020 resulted in a rebound effect in 2021 as the emissions across all sectors rose again (Liu, 2022). Similarly, the latest COP27 (Conference of the Parties) focused on concrete steps towards implementation of the Paris Agreement but failed to jointly agree on the immediate phasing out of all fossil fuels, leaving certain types, like natural gas, as possible energy sources for the future (UNEP, 2022).

# REFLECTION

The history of sustainability shows several decades of international responses to the concerns about environmental and social wellbeing, followed by largely unsuccessful attempts of the world's nations to implement globally proposed strategies and development goals. According to Evans (2012), a possible explanation behind these failures stems from the limited effects of command-control governance and top-down recommendations.

While these might be appropriate for localised issues (e.g., polluted air caused by a specific source), they cannot single-handedly resolve complex, intertwined, and global environmental challenges of the 'shared climate'. (Evans, 2012). Therefore, modern environmental governance must be multi-level and allow the participation of additional state and non-state actors (e.g., businesses, policy-makers, NGOs, and citizens) (Jänicke, 2008). This creates a unique opportunity for service design.

Service designers are often ascribed a position from which they can influence and introduce changes to the existing production-consumption systems to ensure livable and sustainable futures. However, designers do not operate from a secluded space outside these systems but rather from within. Therefore, engaging with the history of environmentalism and sustainable development is important because it prevents designers from seeing sustainability solely as a recent phenomenon and an emerging megatrend. Furthermore, as Philipsen (2022) suggests, looking back allows for tracing the roots of the current climate emergency and promotes a deeper reflection on the political and economic dimension of sustainability.

## 2.3.3 Sustainable consumption

In the second part of this section, we will briefly introduce the concept of sustainable consumption. Due to its broad nature and the fact that it is a subject of multiple disciplines and research streams, this section does not aim to provide an exhaustive overview of sustainable consumption theories, frameworks, and practical applications. Instead, it focuses on how the concept of sustainable consumption (and consumption in general) relates and intersects with the field of design, focusing specifically on ways design can contribute to the shift towards more sustainable and less carbon-demanding lifestyles. Furthermore, we are concerned with consumption related to

ways people obtain, use, and dispose of products and materials rather than consumption (e.g., resources, energies, or materials) required in the production stages.

Additionally, we will briefly touch upon the topic of sustainable consumption within the circular economy framework. However, this will be explored in greater detail later in section 5.3

#### 2.3.3.1 Defining consumption

To engage with the topic of sustainable consumption, we must first investigate the meaning of consumption itself. According to Cambridge academic dictionary (n.d., para 7), consumption refers to "an amount of something that is used, or the process of using something," where the "something," in an economic context, typically stands for products and services. Although people have always consumed to survive (e.g., have enough food) and thrive (e.g., have enough clothing), it was the advent of the linear economy, and especially its boost in the post-World War II era, that marked an unprecedented increase in consumption among industrialised countries (Higgs, n.d.). As a result, the meaning of consumption shifted from indicating the positive outcomes of goods and service exchanges (e.g., as described by the classical economy) to becoming associated with an intensified culture of consumerism (i.e., consumer culture) in which consumption affects socio-cultural dynamics (e.g., consumption as bonding), introduces new infrastructures (e.g., shopping malls) and media (e.g., commercial radio), or defines new practices (e.g., weekend shopping trips) and identities (e.g., the citizen-consumer) (Higgs, n.d.; Håkansson, 2014). According to (Boström, 2019), being born into an industrialised society provides us with experiences of excess that are mostly considered normal and even linked to success, social rituals, and personal well-being.

#### 2.3.3.2 Consumption in design - toward everyday practices

Various groups of designers (including service designers) work in commercial settings, acting on client requirements or applying a design mindset as a strategic tool for growing businesses (Thorpe, 2010). Although many create solutions with the intent to solve people's problems and meet their needs, a large number of products and services are still delivered with the sole purpose of driving sales. The outcomes of such a narrow and short-term view of design (i.e., without considering the long-term impact and value of design solutions) are becoming increasingly apparent through the dire state of today's climate crisis (Micklethwaite, 2019). Although the field of consumer culture is interesting to designers for many reasons, in this thesis, we will focus on the ways the consumption of goods and services is embedded in ordinary and everyday practices as these are often subjects of circular future imaginations and projections (Welch, Keller & Mandich, 2017). Here, we should avoid limiting our understanding of consumption to distinct moments of purchase or other forms of exchange (e.g., gift-giving). In addition to goods and service acquisition (e.g. purchase), we should also study their appreciation (i.e., ways goods and services are used, treated, and embedded in daily life) and appropriation (i.e., emotional attachment, satisfaction). Furthermore, there are also counterparts to consumption, namely devaluation (e.g., loss of economic or aesthetic value, loss of meaning), divestment (e.g., loss of attachment and relationship), and finally, disposal. Therefore, as stated by Warde (2015, p118), "the logic of consumption is found not in the selection of items but in the practices within which they are utilised."

# **REFLECTION**

When researching the link between consumption theories and service design, we reflected on two specific findings – first, the relative lack of consumption research in service design literature and the differences in the meaning of the term 'consumer' between the two fields – both of which we will briefly touch upon.

Firstly, the lack of consumption perspective in the service design research made us reflect on the possible knowledge gaps designers might have when considering the social and environmental impact of their solutions. Although service designers pay attention to how people interact with products and their surroundings over time, considering consumption (both material and immaterial) in terms of acquisition, appreciation, and appropriation (and their counterparts) could provide designers with a new vocabulary for understanding and designing sustainable consumption services. Lastly, by engaging with consumer research, designers could also focus on the challenges of inconspicuous consumption (e.g., use of energy, water, internet), which underpins everyday practices and adds to the overall consumption pattern.

In service design literature (e.g., Vargo & Lusch, 2004), the term consumer is often replaced with the concept of the customer, as the service-dominant logic assumes the active involvement of people in the co-creating value of products and services rather than their passive consumption (i.e., destruction of value). While we are aware of this distinction and agree with the view of the service logic, we will, in this thesis, use the two terms interchangeably to accommodate the cross-disciplinary reference to people engaged in everyday circular consumption practices.

# 2.3.3.3 Designing sustainable consumption

In response to the ongoing climate crisis and the depletion of planetary resources, numerous research fields (e.g., psychology, sociology, and behavioural economics) and policies began to focus on ways to meet sustainable targets defined by the twelfth sustainable development goal (SGS), namely the need for achieving sustainable production and consumption (UN, n.d.; AmaralJunior et al., 2019). Although there is no widely-accepted definition of sustainable consumption, the following formulation was proposed during a UN conference in Oslo (in 1995), suggesting that the concept refers to the "use of goods and services that respond to basic needs and bring a better quality of life, while minimising the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardise the needs of future generations" (O'Rourke & Niklas Lollo, 2015, p235). The initial efforts to implement sustainable consumption aimed at reducing waste and developing green technologies, both of which were supported mainly by behavioural nudges to alter people's behaviour. However, as these have provided so far only limited results, the recent approaches have started to recognise the need for a wider systemic and cultural transformation to challenge the ways unsustainable consumption is currently lock-in and reinforced through socio-technical systems (Geels et al., 2015; Anantharaman, 2018; Truong et al., 2022).

In the design discipline, the call for rethinking the unsustainable consumer culture and modern lifestyles can be traced back to the 1970s, as seen in the works of design critics like Viktor Papanek (Thorpe, 2010). However, it was not until several decades later that the gradual shift in the sustainable consumption focus became apparent in mainstream design, urging designers to redirect unsustainable practices toward more sustainable alternatives (e.g., the rise of car sharing) (Thorpe, 2010; Villari, 2022). Furthermore, to tackle wicked and complex environmental, social, and economic problems, designers began exploring transitions toward more sustainable futures through new methodologies of system design, service design, transition design, or design for social innovation (Villari, 2022). Nowadays, design (including service design) is recognised as a field with the capacity to contribute to low-carbon and post-carbon consumption through understanding customer behaviours (e.g., their values, habits, and needs), anticipating future needs and consumption trajectories, or visualising consumption patterns on different system levels (e.g., individuals, households, organisations, or society) (Thorpe, 2010; Moreno, Lofthouse & Lilley, 2011; CIE-MAP, 2016; Villari, 2022).

## 2.3.3.4 Challenges of sustainable consumption

In regards to the circular economy (and sustainable consumption in general), there seems to be a lack of attention paid to the dynamics of circular consumption practices and the needs of those who participate in it. These important considerations are often overlooked or even treated as an afterthought. (Lofthouse & Prendeville, 2017). This lack is surprising, given the popularity and political support for circular economy transitions, as it assumes that people will accept the new ways of consuming regardless of the required consumption labour (e.g., repairing, sorting) and barriers (e.g., price, convenience) it presents (Hobson et al., 2021). Furthermore, this approach omits the social impact people's differences (e.g., social class, disability, gender, age) can have on their consumption patterns and

the available consumption options and possibilities. Moreover, it assumes everyone has the same opportunities and means to access, adopt, and maintain sustainable consumption practices (Middlemiss, 2018).

This thesis focuses on gender, its role in sustainable consumption, and strategies service designers can use to create more inclusive and equal services. Besides our interest in the topic, we chose to emphasise the role of gender as women, men (and other gender minorities) are differently impacted by sustainable consumption policies and engage differently in sustainable consumption labour (Middlemiss, 2018; Bloodhart, 2020). Therefore, in the following, and final portion of the initial literature review, we will explore the concept of gender and its relevance for design.

## 2.4. Gender and its role in design

As a discipline, design focuses on understanding needs and creating adequate and desirable solutions. However, the design process can sometimes result in solutions that inadvertently or deliberately exclude certain groups of people, especially marginalised and vulnerable communities (Wikberg Nilsson & Jahnke, 2018). Although the history of the relationship between design and gender has been extensively studied from critical gender perspectives, focusing primarily on the awareness of gender biases in product and urban design, the focus of design researchers and practitioners on ways gender influences design context remains fairly recent and underdeveloped (Brandes, 2008; Esfahani, 2020).

In this portion of the literature review, we will first introduce gender as a concept, focusing on its definition and key characteristics. Next, we will explore the ways gender is currently considered in design, and more specifically, service design. Alongside theoretical exploration, we will add several examples inviting readers to reflect on how services and experiences are gendered. Finally, we will introduce the concept of intersectionality and highlight its importance for design theory and practice.

#### 2.4.1 What is gender?

Defining gender is neither an easy nor a straightforward task. We will begin by separating the terms' sex' and 'gender' to explain why these cannot be used interchangeably despite their intersections. While the concept of sex refers to rather stable bodily characteristics labelled as female and male (e.g., genitals, hormones, genetics, childbearing and breast-feeding abilities), gender comprises social and cultural aspects such as social expectations, expressions, meaning, and behaviours associated with the norms of femininity and masculinity (e.g., Jule, 2014; Phillips, 2005; Lindqvist et al., 2021). In other words, gender is a social construct (i.e., something one becomes through the process of socialisation) and is influenced by normative systems and values of a particular society or time era (Phillips, 2005). For example, in Western societies, the idea of gender was historically built on the notion of differences, creating opposing binary categories of women and men based on beliefs about their behaviours, appearances, traits, or occupations (Eisend, 2019; Rushton et al., 2019). As a result, the concept of gender is linked to the idea of gender roles which refer to ways people are prescribed and expected to behave within a given society (Blackstone, 2003). Traditionally, women in Western societies were associated with caring and nurturing activities that restricted them to the private sphere of their homes (Fenster, 2006). Men, on the other hand, had access to the public realm and could educate themselves and engage in a wage-labour to provide financial stability for their families. As women entered the workforce, many gender roles and stereotypes followed them, resulting in further inequalities between women and men (e.g., women holding lower positions than men) (Blackstone, 2003). Therefore, to understand gender roles, we must view them not merely as social scripts for expected behaviours but treat them as evidence of power distributions between genders. Furthermore, gender roles are often stereotypical, meaning that they originate within oversimplified views on differences between sexes. For instance, typical gender stereotypes suggest that men are naturally rational but less emotional, while women tend to be driven by emotions

#### 2.4.2 Beyond the binary view

and act irrationally (Blackstone, 2003).

Given that gender and gender roles are socially constructed, they can be negotiated, disrupted, and changed (Blackstone, 2003). The traditional view on women's place in society was intensively contested during the 20th century, resulting in today's women having access to all levels of education, professional opportunities, planned parenthood, or economic well-being. At the same time, men's role has also shifted to encourage men to engage in childcare and domestic labour activities (Harvard, 2008). Furthermore, the traditional binary view on the nature of

gender was also questioned, especially by second-wave feminism. As a result, the modern understanding argues that gender is not determined by sex but rather by a personal sense of identity that may or may not align with the biological sex ascribed at birth (e.g., WHO, n.d.; Rushton et al., 2019; Lindqvist et al., 2021). To exemplify, a person who was born with male bodily traits and whose gender was assumed at birth (e.g., given a male name and pronouns) might, later on, change their gender identity (e.g., woman) and even modify their bodies (e.g., obtaining female bodily features). This more nuanced approach to gender was picked up, especially in the digital world, with companies like Facebook offering over 70 different gender categories for users to choose from (Holaschke, 2021). However, despite these progresses and attempts to reform the binary understanding of gender and to reduce gender inequality, many challenges prevail (e.g., Harvard, 2008; Lindqvist et al., 2021). This also applies to design that continues to be taught and practised on the basis of gendered assumptions and biases (e.g., Brandes, 2008; Wikberg Nilsson & Jahnke, 2018; Holaschke, 2021). Therefore, in the following section, we will explore the impact of gender on the design context, followed by a short reflection on the gendered nature of the design field.

Gender is a complex topic that might appear intimidating by its variety of diverse concepts, theoretical streams, political views, and the continuously growing need to expand its boundaries. Therefore, it is beneficial to explain key terms frequently mentioned in relation to gender, namely equality, equity, justice, and sensitivity, which we will shortly introduce below.

The concept of <u>gender equality</u> implies providing equal access to rights, opportunities, and responsibilities irrespective of one's gender (i.e., whether one is a man, woman, or has another gender identity). The call for equality does not translate to erasing differences between the genders but rather seeks to ensure that both men and women (and other genders) have the same access and rights, regardless of any gender differences between them (UNFPA, 2015; EIGIE, n.d.). Now, the concept of <u>gender equity</u> is often used interchangeably with gender equality. However, they do not mean the same thing. Although, similarly to gender equality, the equity approach recognises differences between genders (e.g., in their needs, opportunities, or access to power), it goes beyond the goal of reaching equal rights or treatment. Gender equity acknowledges that even if people gain equal opportunities and rights, they will not automatically become equal, as their differences will continue to favour one gender over the other. Therefore, equity is centred around the idea of fairness and aims at the distribution of resources and opportunities so that an equal state can become possible (UNFPA, 2015; EIGIE, n.d.).

In terms of circular consumption, the act of paying attention to gender equality can result in providing all genders with the same opportunities to access circular products and engage in circular practices such as caring for things or repairing them. However, despite this equal access, women might still find themselves lifting larger volumes of domestic labour, while men might struggle to find more sustainable alternatives that would meet their needs and preferences.

Therefore, taking an equitable approach is to recognize these discrepancies and devise strategies to lower them to ensure that everyone can benefit from equal access. However, to achieve a completely just situation, the solutions must be systemic.

Furthermore, the term <u>gender justice</u> refers to the combined achievement of gender equality and equity that penetrates all areas of domestic and public life (Figure 4). Therefore, gender justice is also a systemic and legal term meaning that equal rights and equitable distribution are ensured and coined in legal (e.g., law), political (e.g., policies), social (e.g., attitudes), financial, and technical structures (Oxfam, n.d.; UNDP, n.d.)



Figure 4: A visual depiction of the terms inequality, equality, equity, and justice (Source: University of Bath, https://bit.ly/3101pPh).

Lastly, the term <u>gender sensitivity</u> refers to the necessary step for engaging with the previous three concepts because of its fundamental call for acknowledging and considering the social dynamics of gender that affect many domains of both personal and public life. Sensitivity to gender also includes recognizing the boundaries and stereotypes driven by traditional and outdated gender roles and paying attention to instances of gender-based discrimination and exclusion. Therefore to act in a gender-sensitive way means to become aware of gender discourses and their manifestation in the ways people reason and act. If an intervention, policy, or program is gender-sensitive, it will typically focus on generating and equally processing gender-segregated data (e.g., about needs, priorities, and capacities of different genders), assess their impact on different genders, and engage in action to prevent gender inequality (EIGIE, n.d.; LCWU, n.d.; UNESCO, n.d.; UN-REDD, n.d.).

#### 2.4.3. Gender and design

Our initial assumption was to find a relatively extensive volume of literature discussing the role of gender in design, given that many design disciplines (including service design) engage in participatory processes and advocate for a thorough and systemic understanding of user needs. However, besides popular publications like Data Feminism, Invisible Women, or What Works, we found fewer academic articles on the topic than we initially expected. Similarly, the foundational literature for service design research and practice (as Stickdorn, 2018 or Penin, 2018) does not contain any chapter directly dedicated to gender experience tied to services or the gendered nature of everyday interactions with service systems.

According to Brandes (2008), this identified gap (in design disciplines) is caused by the missing focus on gender as an important factor influencing how people access, use, and engage with everyday objects and services. The results of the lacking gender perspective have led to two major design consequences. First, the design of everyday objects (e.g., car seats) and services (e.g., transportation, health screening) is often centred around a normative idea of a man, as male physiology and psychology, alongside their needs and social roles, was historically treated as representative of the whole human race (Wikberg Nilsson & Jahnke, 2018). Second, despite the shifting understanding of gender and gender roles (e.g., plural and fluid), binary ideas and gender stereotypes (e.g., masculine men and feminine women) remain deeply rooted in our society and, consequently, reflected in the design of products and services. Design artefacts and systems, guided by stereotypical views of behaviours and expectations based on gender, not only risk leaving many people behind but further perpetuate gender biases and inequalities (Lillegård et al., 2021).

Naturally, the impact of gender is not restricted to products and services, but it affects larger economic, social, and political structures (EU, n.d.). For example, when women enter social activities or professions previously dominated by men, there is often a decrease in both prestige and financial compensation for the executed work (Cacouault-Bitaud, 2001; Miller, 2016). Furthermore, women in these professions are frequently referred to with the label "female" (e.g., female doctor, female professor, female engineer), which is typically not used for professions with a large proportion of women (e.g., teachers, social workers, hairdressers, nurses, or secretaries) (Wikberg Nilsson & Jahnke, 2018). The same is true in the field of design, where women practising design are recognized and written about as female designers (Figure 5)



Sources https://bit.ly/3NoyMCq, https://bit.ly/42d6EGA)

#### 2.4.3.1 Gender in design education and practice

The gender differences between women and men are also apparent in many design disciplines, starting already within design education programs. While women are frequently enrolled in design courses concerning service, fashion, or jewellery design, men are overrepresented in industrial, furniture, and product design (Brandes, 2008; Bjørnstad, 2018). According to Bjørnstad (2018), this difference leads to further perpetuations of women being inclined to empathetic and decorative practices, whereas men are associated with technology, materials, functionality, and the ability to shape nature.

As with many design schools and study programs, gender imbalance and inequality persist in the workforce. According to the Design Council's report (2022), men make up 77% of all designers in the current design economy, especially in the fields of digital, urban, and product design. The only exception is fashion, where 80% of workers in clothing design are women. This disparity is especially concerning in digital design (where 85% of all digital designers are men), as the field currently accounts for nearly half of the current design economy (Design Council, 2022). To understand what drives gender differences among design workers, Reimer (2016) studied the role of gender in creative labour within several UK design consultancies. As the focus was on understanding the firms' structure, most interviewed participants occupied senior design positions held primarily by men. The study reported a strong preference for design qualities typically associated with men, such as combativeness, focus on gaining clients, or competition. Furthermore, the working demands of design studios (e.g., architecture firms) consisting of over-hours, unpredictable schedules, and business trips conflicted with the care and household demands placed on women and further reinforced the masculinity of design labour (Reimer, 2016).

Despite the obvious challenges for women to be on-pair with their male counterparts, there is an increasing number of campaigns, projects, and collaborations aiming to raise awareness about women's role in design and their approach to designing practice (Figure 6) Yet, more data and research is needed to understand challenges to inclusion and employability among other genders (e.g., transgender or binary designers) (Design Council, 2022).





Suhair Khan on her inspirational career path, her time at Google. Arts and Culture and founding the platform open ended design that focused on projects at the nexus of creative technology and innovation.

Creative Strategist, Design, Diversity & Inclusion



**DES!GN!;WOMEN** 

Harriet Richardson Harriet Richardson on vhy she decided to found her studio Good Richardson, things she learnt from working at Pentagram and using her creative practice to communicate positive and pogianar points of view as a way of calling for

Design, Design for Good, Visual Artist, Visual Identity, she/her



0-0-4 0-0-4

Giulia Boggio Giulia Boggio on their unique creative approach to graphic and typeface design, challenges they've faced during their carer so far and how we can encourage greater diversity in the design and typography industry.

Design, Editorial, Typeface Design, Typography, she/they

Figure 6. Examples of digital and community projects focusing on women in design (Source; https://bit.ly/3MIVCUx and https://bit.ly/3Mkz4IE).

## 2.4.4 Intersectionality

Lastly, we will introduce the concept of intersectionality, which was initially introduced in feminist literature to point out the inequalities and oppressions experienced by women from varying ethnic backgrounds (Risberg & Mensi-Klarbach, 2019). According to D'Ignazio and Klein (2020), by recognizing the influence of women's ethnicity (or other factors like class and religion), it becomes impossible to identify a universal set of challenges that would cover the lived experiences and struggles of women worldwide.

Therefore, the concept of intersectionality provides a lens for understanding ways various dimensions, besides only gender, intersect and influence a person's identity and experiences with the world (D'Ignazio & Klein, 2020). In other words, applying the intersectional approach means paying attention to multiple domains simultaneously, considering that some might be visible (e.g., ethnicity, age), whereas others are hard to detect (e.g., mental health, language barriers) (Risberg & Mensi-Klarbach, 2019). To exemplify, two women will not have the same challenges and needs if one is a non-white person born outside the country and living with an invisible illness (e.g., depression) while working a low-paid job. Furthermore, intersectionality also has a temporal dimension, meaning that one's emotional, cognitive, physical, and societal abilities do not stay the same but change over time (e.g., illness or migration), leading to new dimensions intersecting with the person's gender (Holmes, 2018).

## 2.4.5 Primary focus on girls and women

Although taking the intersectional perspective is essential in making sustainable consumption accessible for all (as it lowers the risk of bias), this thesis focuses primarily on gender as one of the critical domains that impact the everyday experiences of individuals and groups. Furthermore, while acknowledging gender plurality and fluidity, we will primarily explore possible consumption inequalities, barriers, and opportunities concerning women and girls (in relation to their male counterparts). Gender equality and empowerment of all women and girls represent the fifth Sustainable Development Goal (SDG) documented in the UN agenda (UN, n.d.). The goal has several targets that include, for example, efforts to end gender-based discrimination and violence, acknowledge the value

and need for equal domestic labour, and strengthen the involvement of women and girls in planning processes and decision-making acts (Pillan, 2023). Hence, by focusing on how the positions of girls and women affected our understanding and design of circular consumption practices and services, we are also attempting to connect two SDGs (Figure 7).



Figure 7.The fifth and twelfth SDG (Image source: https://sdgs.un.org/goals)

# 2.5. Summary of findings

Next, we will briefly summarise the knowledge we gained during the literature review and how these insights helped us formulate research questions that will inform the next steps of our thesis process.

First, during our investigation into the discipline of service design, we became aware of its ongoing tensions in seeking a well-rounded and standard definition and how these, in return, leads to varying perspectives on who is considered to be a service designer and why (subsection 2.2.2) Furthermore, by reflecting on the frequent conceptualization of designers as agents of change, we compared service design to other emerging transition-led approaches (e.g., Transition Design), highlighting their challenges in navigating the complexity of large-scale socio-technical transition (subsection 2.2.3).

Regarding the topic of sustainability, we engaged in a deeper investigation of its historical roots (section 2.3.2), which helped us understand its wide and complicated socio-political dimensions. Against this background, we explored the concept of consumption, which we defined as an incremental part of everyday practices rather than sole moments of purchase or exchange (section 2.3.2.2). This understanding is important when considering different ways to extend product life cycles and design new sustainable consumption practices (subsection 2.3.2.3). However, the challenge of sustainable consumption rests with its lack of research into who, how, and under which conditions can participate in it (subsection 2.3.2.4).

Therefore, while acknowledging the existence of various specific social differences, we decided to concentrate on gender (section 2.4). Here, we drew an important difference between gender and sex while discussing and challenging the predominant binary view of Western societies (subsections 2.4.1 and 2.4.2). However, our primary focus was to explore the role of gender in design. We discovered that both design research and practice fail to effectively include the gender perspective, resulting in much of the existing designs of products, services, systems, and social interactions being gendered (section 2.4.3). This challenge does not stop at the designers' desks but penetrates the dynamics of design education and the design economy in general (subsection 2.4.3.1).

## 2.6 Focus and research questions

Now, the topics we explored throughout our literature review are broad, and it is beyond the scope of this thesis to extensively investigate the intersection of service design, sustainable consumption, and gender. Therefore, following a consultation with our supervisor and the need for a specific design case, we decided to narrow down our focus to a specific research context: **the circular economy**. We chose this context for two reasons. Firstly, the circular economy is gaining significant momentum in many countries, including Denmark, forcing designers to pay closer attention to the topic. Secondly, the topic of circular economy was also included in our Master's studies alongside

the repeated call for more understanding of how service design can contribute to transitions toward sustainable and liveable futures.

# 2.6.1 Research questions

In the next chapter, we will dive into the concept of circular economy, laying the ground for an investigation of ways gender impacted circular consumption practices. In doing so, we will be seeking answers to the following research questions:

- What is a circular economy, and what are its important elements?
- What are the major barriers and challenges to implementing a circular economy, and what does this mean for service designers?
- What are the key competencies of service designers working with the circular economy, and how prepared are service designers today?
- What challenges can service designers help solve to support the transition toward circular society?
# **3. PROJECT CONTEXT**

The following chapter introduces and explores the project context of this thesis, namely the intersection of circular economy, service design, and gender. However, as this chapter illustrates, the path to this intersection is not straightforward. To take our readers along the journey, we will first briefly present the dominant concept of a linear economy and highlight its shortcomings. Following that, we will introduce the idea of a circular economy and its key frameworks. Importantly, we will also discuss the barriers to its implementation, paying closer attention to the currently missing focus on the social dimensions and sustainability of circular solutions. For example, we will ask ourselves - who gets to participate in a circular economy, and who is left out? To support these reflections, we will shortly introduce the emerging concept of a circular society.

In the second half of the chapter, we will narrow our focus on the role of service design in the circular economy and investigate what design competencies and tools are linked to circular design. Finally, as we are keen to explore any capabilities specific to service designers, we will support our findings with the survey and interview results from service design professionals working with circularity projects. Besides focusing on their capabilities, we will also explore their views on the currently missing social dimension to explore ways in which circular futures can become truly feasible and irresistible.

To conclude this chapter, we will present our refined problem statement, which will guide our design process.

This chapter consists of the following sections:

3.1 Introduction
3.2 Linear economy
3.3 Circular economy
3.4 Circular economy and gender
3.5 Service design for circular economy
3.6. Survey with service designers
3.7 Interviews with service designers
3.8 Initial problem statement

### **3.1 Introduction**

Circular economy (CE henceforth) is considered an important strategy for achieving sustainable development and transitioning to more sustainable production-consumption systems (Chizaryfard et al., 2021). As a term, CE represents an antonym to the dominant concept of a linear economy in which products follow the linear 'make-usedispose' model of production and consumption, leading to depletion of natural resources, accumulation of waste, and large volumes of emissions and pollution (e.g., Murray et al., 2017, Chizaryfard et al., 2021). By promoting circulation of materials through biological (e.g., biodegradation) and technological (e.g., recycling or refurbishing) cycles, instead of following a one-way path, the CE aims to have a minimal impact on the environment while promising competitive business benefits (e.g., savings, risk reduction, new revenues) (Rios and Charnley, 2018; Kopnina, 2021).

To provide a clear understanding of CE, we will first explore the historical origins and unsustainable nature of the current linear production-consumption systems. Afterwards, we will delve into the definitions, conceptual frameworks and implementation of CE.

#### 3.2 Linear economy

#### 3.2.1 Understanding a linear economy

Prior to industrialization, the majority of people engaged in closed loops of production and consumption due to material scarcity and necessity (Stahel, 2020). However, following the first (1760-1830) and the second industrial revolutions (1820-1860), technological advancements dramatically changed the existing small-scale manufacturing and production processes, allowing for mass production and more effective distribution of diverse products for lower prices (Andrews, 2015; Casson & Welch, 2021). Subsequently, the consumption patterns changed and intensified as consumers could choose from a larger variety of goods offered by competing businesses (Casson & Welch, 2021). Besides enjoying more diversity of foods and clothing, many more people could invest in affordable home improvements (e.g., purchasing furniture and textiles) or begin to travel for leisure (Flacher, 2015). However, the increased production speed also led to a decreased quality of products and their earlier disposal due to breakages and malfunctions (Andrews, 2015). This new economic model with a predominant focus on continuous linear streams of production and consumption is therefore described as a linear economy as it assumes a one-directional trajectory of consuming and disposing of products afterwards or at the end of their life (Figure 8) (Okorie et al., 2018).



Figure 8. A schematic depiction of a linear economy. (Source: Golisano Institute for Sustainability, https://bit.ly/3LK01Vx and adapted by the authors)

"We need things consumed, burned up, replaced and discarded at an ever-accelerating rate" (Victor Lobew in 1955, cited from Higgs, n.d., para32). Although industrialisation replaced the previously experienced scarcity with abundance, the elements of preindustrial consumption did not completely disappear. Alongside mass-producing factories and commercials for new products, people still engaged with common repair services or exchanged used objects and goods (Stahel, 2020). Furthermore, intensive periods of reusing and recycling of materials and products re-emerged during the war periods of the 20th century as many countries dealt with collapsing supply chains, lack of materials, and prioritising production for the needs of the military (Casson & Welch, 2021).

However, following the end of rationing and the reconstruction of post-war economies, the previous practices of turning products into waste at the end of life returned. Moreover, as mentioned in the previous chapter, the 1960s introduced new lucrative opportunities to source materials (e.g., paper, metals) through global markets as opposed to recycling, recovering and replacing them locally (Andrews, 2015). In addition, the development of new synthetic materials and fabrics (e.g., lycra) imposed even more constraints on their recycling or reuse (Casson & Welch, 2021). In the following decades, the linear economy continued accelerating and cementing its position as the main production-consumption model, partially due to changing social norms (e.g., women joining the workforce) and the growing importance of consumption (e.g., consumption as part of identity) (Flacher, 2005; Warde, 2015).

#### 3.2.2 The issues of linear economy

The demands of the linear economy have led to significantly increased consumption and depletion of limited natural resources while simultaneously accumulating large quantities of waste (Esposito, Tse & Soufani, 2018; Jaeger & Upadhyah, 2019). This wasteful approach to resources not only challenges the widely-accepted need for sustainable development but also leads to numerous environmental catastrophes (e.g., plastic pollution) and causes disturbances in global supply chains (e.g., loss of profit) (Fleischmann, 2019; Jaeger & Upadhyah, 2019; Sumter, 2020). Similarly, the exploitation of natural resources also affects their quality and general productivity (e.g., worsens crop productivity). In combination with the effects of changing climate (e.g., droughts), many essential materials and products might become scarce or inaccessible, leading to political and social instabilities (Esposito, Tse & Soufani, 2018).

Despite its many benefits and socio-technological progress, the one-directional model of a linear economy is unsustainable for ensuring the well-being of both present and future generations (Andrews, 2015). For instance, if unchanged, the consumption needs of the rapidly growing middle class will, by 2030, require resources exceeding the capacity of two planets (Okorie et al., 2018). Furthermore, the annual volumes of municipal waste produced by urban areas are projected to rise to 2.2 billion tonnes by 2025. As nearly 70% of the world's population is expected to live in cities in 2050, this figure will continue to grow (Andrews, 2050). Therefore, to ensure livable futures, there is a pressing and undeniable need to develop an alternative approach to ensure more sustainable production and consumption - and this is where the circular economy becomes important.

# **REFLECTION**

While there is no doubt that the 'make-use-dispose' model of the linear economy is unsustainable, many extend their critique toward the entire system of neoliberal capitalism and the concept of economic growth (e.g., Büchs & Koch, 2019; Mah, 2021; Philipsen, 2022). When writing this thesis, we have often come across the concepts of de-growth, stablestate economy, or other alternative economic models promoting a more circular, sustainable, and sufficient approach to production and consumption. However, incorporating these tensions and differences between varying economic models within our project is outside the scope of this thesis. Nevertheless, on multiple occasions, we have reflected on the need for service designers to understand different economic theories and models better.

#### 3.3 Circular economy

#### 3.3.1 The origins of a circular economy

Although the concerns about the environmental and social damage of linear economy can be traced to the 19th century (Casson & Welch, 2021), it was not until the 1960s when the main debates on waste and resource management began, focusing primarily on strategies to encourage recycling, composting, or turning waste into energy. Yet, it was first in the 1970s when the first ideas of closed-loop and circular systems emerged in response to the growing evidence of the impossibility of endless economic growth and infinite material extraction (Blomsma & Brennan, 2017; Simeone, van Dam & Morelli, 2019). In academia, the urges for re-thinking existing linear models led to the development of new disciplines (e.g., ecodesign, environmental economics, biomimicry) that studied the dynamics of natural systems and their possible applications to the existing industrial practices (e.g., waste management) (Blomsma & Brennan, 2017). Therefore, the concept of a CE cannot be traced to a single school of thought but has its root in several related disciplines and approaches (Simeone, van Dam & Morelli, 2019).

Following the release of the Brundtland report in 1987, the concept of a circular economy (CE henceforth) became more closely linked to the widely popular paradigm of sustainable development, which allowed the idea of closed loops to gain more traction among businesses and governments (Blomsma & Brennan, 2017). Over the past decades, the CE concept was largely promoted by consultants and practitioners (e.g., Ellen MacArthur Foundation, EY, Danish Design Center, KPMG), which led to the publishing of numerous industry reports and toolkits aiming at its implementation (Kirchherr et al., 2017). At the same time, the transition to CE has become essential to the idea of achieving a sustainable society and is included in fundamental sustainability policies and transition plans (e.g., a European Green Deal, New European Bauhaus) (EU, n.d.).

However, the linking between sustainability and circularity has also increased the complexity of the waste-resource debates and given rise to several new terms and concepts (e.g., green economy, sustainable consumption, zero-waste, extended producer responsibility) that accompanies the existing CE discourses (Blomsma & Brennan, 2017). As a result, CE nowadays represents a complex and multi-faceted concept. Therefore, we will only focus on providing readers with the key knowledge regarding the CE definition, key frameworks, and main streams of its growing critique.

#### 3.3.2 Defining a circular economy

Although the majority of definitions describe CE as an alternative and regenerative economic system in which products and materials pass through closed loops to maximise the use of resources and eliminate waste (e.g., Ellen MacArthur Foundation, 2013; Blomsma & Brennan, 2017; Okorie et al., 2018), the concept lacks a widely accepted definition (e.g., Kirchherr et al., 2017; Okorie et al., 2018; Chizaryfard et al., 2021). To illustrate, Kirchherr et al. (2017) identified over 110 CE definitions proposed by practitioners, policymakers, and scholars. While this quantity can be ascribed to the concept's transdisciplinary complexity or evolving nature, it might also be problematic as it could dilute the concept's meaning and create difficulties in finding common ground among stakeholders (Kirchherr et al., 2017). For example, several scholars (e.g., Kirchherr et al., 2017; Kopnina, 2021) pointed out that, compared to older definitions of CE promoting its ecological benefits, newer definitions or those proposed by some CE practitioners tend to highlight the possibilities of economic growth, creation of jobs, and business value of CE over its environmental and social benefits.

Therefore, in the absence of a widely-accepted definition of CE, the following definition proposed by Kirchherr et al. (2017, p224) will be used for the purpose of this thesis:

"A circular economy describes an economic system that is based on business models which replace the 'end-of-life' concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes, thus operating at the micro level (products, companies, consumers), meso level (ecoindustrial parks) and macro level (city, region, nation and beyond), with the aim to accomplish sustainable development, which implies creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations."

# REFLECTION

The reason we chose the above definition is because it doesn't just link the CE to sustainable development and regeneration, but also provides a systemic perspective and covers multiple levels of implementation (i.e., micro, meso, macro). This makes it a more comprehensive and informative option for designers seeking to understand the concept. In contrast to simpler and more broad definitions, like the one proposed by the Ellen MacArthur Foundation (2013), the definition by Kirchherr et al. (2017) also includes the topic of consumption and highlights the potential economic, social, and environmental benefits of CE.

#### 3.3.3 Principles and frameworks of a circular economy

Similar to the contested nature of the CE definition, several principles and frameworks are associated with the CE, all of which require re-thinking the existing linear modes of production, distribution, and consumption (Wastling et al., 2018; Ogunmakinde et al., 2021). Given that their comprehensive overview is beyond the scope of this thesis, the following paragraphs will shortly introduce the three commonly mentioned ones. However, it is important to mention that these frameworks and principles do not oppose each other but rather contribute to the broad and systematic picture of CE.

#### 3.3.3.1 Cradle to cradle (C2C)

The 'Cradle to cradle' (C2C) framework developed by Braungart and McDonough (based on Stahel's concept) introduces a closed-loop approach where all products and materials can be categorised in terms of biological or technical nutrients, circulating in separate loops without any risk of contamination. Furthermore, the framework encourages the application of eco-design principles (such as renewable over non-renewable resources and energy) and promotes the servitization of consumption to ensure prolonged use and satisfaction with products and materials (Figure 9) (Ogunmakinde et al., 2021).



Figure 9. Schematic visualisation of a Cradle-to-Cradle framework (Source: Dreers & Sommers, https://bit.ly/3VISXwZ).

Although criticised for its overly technical focus, the C2C framework can be considered one of the pillars of the CE concept and is even treated by some as synonymous with CE (Ogunmakinde et al., 2021). However, it is perhaps possible to argue that while CE calls for the design of systems in which resources and products continuously circulate, C2C focuses on the design of products and product-service systems capable of doing so.

## 3.3.3.2 The butterfly model

Among the most well-known is the circularity 'butterfly' model proposed and popularised by the Ellen MacArthur Foundation (2013). By dividing the CE system into biological and technical cycles, the model proposes various closed-loop trajectories of resources and products between producers and consumers, abolishing or delaying the creation of waste and decoupling profit from the extraction of finite resources (Figure 10) (Hopkinson et al., 2018). According to The Ellen MacArthur Foundation (n.d.), the CE system is driven by three core principles: waste elimination, continuous cycling of resources, and regeneration of natural capital (e.g., supporting biodiversity).



(Source: Ellen MacArthur Foundation, https://bit.ly/3poDmGM).

Importantly, the strategies for keeping resources and products in use differ depending on whether they follow biological or technical cycles. While the biological loops in the diagram draw on natural processes of biodegradation (e.g., composting of organic resources), the technical loops aim at keeping products and resources in use for as long as possible (e.g., through sharing and reusing) (Ellen MacArthur Foundation, n.d.). However, both cycles are also structured based on the principle of value retention. In other words, prolonged use of a product (e.g., a smartphone) followed by its repair (e.g., battery exchange) is a more efficient strategy compared to remanufacturing or recycling, which requires more energy and might essentially lead to waste creation (Reike, Vermeulen & Witjes, 2018).

# 3.3.3.3 The Rs framework

Finally, most CE discussions and descriptions centre around several key imperatives and strategies, forming the so-called R-framework. Although the exact number of R principles varies, the most commonly mentioned and listed according to their priority are Reduction, Reuse, and Recycling (Kirchherr et al., 2017; Reike et al., 2018). The 3Rs framework is explicitly (e.g., EU, 2020) or implicitly (Danish Ministry for Environment, 2021) mentioned in many CE-focused policies, reports, and actions plans, often accompanied by an additional R, which denotes strategies for Recovery of by-products created during production and consumption to prevent turning them into waste. However, several scholars (e.g., Potting et al., 2017; Reike et al., 2018) further extended the 3Rs framework to include additional strategies (9Rs- and 10s-framework) for achieving greater circularity within production and

consumption systems (Figure 11). Similarly to the original 3Rs framework, the principles are structured according to a short, medium-long, and long loops hierarchy. Here, short loops, including strategies like Refuse, Reduce, and Repair, are at the top and considered the most preferable (Reike et al., 2018).



Figure 11. The overview of 9Rs framework (Potting et al., 2017, p5).

#### 3.3.4 Implementation of a circular economy

The literature showed that since its origins in the 1960s, the concept of CE has matured and gained significant attention among all sectors, especially businesses and policymakers, for its visions of economically profitable regeneration and continuous looping of resources while offering social and environmental benefits (Chizaryfard et al., 2021). However, the transition toward the CE cannot rest upon shifting individual business models and strategies but requires a systemic change on the micro, meso, and macro level, involving large numbers of actors and networks (as highlighted by Morales, 2020 or Chizaryfard et al., 2021). Perhaps, it is due to this complexity that the annual Circularity Gap Report (CGRi, 2023) claims that only around 7.2% of the global economy is currently circular. Based on a methodology of measuring various flows of materials, the report states that the global economy continues to overshoot planetary boundaries by extracting virgin resources and turning over 90% of materials to waste or otherwise unavailable for other use (CGRi, 2023).

"The global economy is only 7.2% circular" (CGRi, 2023, para6)

Yet, this might seem surprising to many, given the large number of companies and initiatives that have recently begun embracing circularity in their business models (Figure 12). According to van Meeteren (2021), there is a risk of 'green-' and 'circular-washing' when the circularity principles are applied in silos (i.e., concerning only some products) or as an add-on to existing unsustainable models (e.g., recycled materials are used in fast-consumption and non-durable products). Further limitations and critiques of the circular economy will be discussed in the following subsections (3.3.5 and 3.3.6).



Figure 12. A compilation of existing and marketed circular solutions developed by known businesses or initiatives (Source: Images sources from www.google.com, collage made by the thesis team).

Lastly, besides governmental support, policy work, and new production-consumption practices, the implementation of a CE is tightly linked to digital technology. Emerging and data-driven technologies (e.g., IoT, AI, or cloud computing) have introduced possible ways for companies and organisations to transition and implement CE initiatives (Demestichas & Daskalakis, 2020). By collecting, analysing, and sharing data, companies can better utilise materials, improve remanufacturing practices, or predict and manage production demands (Chauhan et al., 2022). Furthermore, blockchain technology provides opportunities to track material flows while improving communication through supply chains (Upadhyay et al., 2021). In addition, digitalisation enables new ways of creating value for customers by introducing product service systems (PSS), enabling sharing economy, predicting needs for repair and maintenance, or creating digital infrastructures for smart homes and cities (Ramakrishna et al., 2020; Chauhan et al., 2022). Finally, the Internet allows for the exchange of peer communication (e.g., via social media) that makes unsustainable production practices (e.g., child labour, environmental damage) more transparent to consumers, NGOs, or policy-makers.

Nevertheless, digital infrastructures are also susceptible to power dynamics and inequality and cannot alone drive social changes or ensure sustainable practices (Graham & Haarstad, 2011). Despite the technological opportunities, there are also several barriers to unlocking the digitalisation potential of the CE. According to Chauhan et al. (2022), the barrier of implementation cost, followed by the lack of environmental knowledge and missing data on material flows, prevent manufacturers and policy-makers from advancing digitisation efforts faster and more efficiently.

#### 3.3.5 Barriers to CE

Through its focus on regenerative systems of closed loops and implementation of R-principles in practice (e.g., repair services), the transition to CE calls for many profound changes but also meets numerous barriers (Kopnina, 2019). Based on the reviewed literature, the barriers seem to appear on all system levels (i.e., on micro, meso, and macro levels) and can be roughly divided into legislative, organisational, technological, and socio-behavioural (e.g., Hopkinson, 2018; Esposito et al., 2017; Jaeger & Upadhyay, 2019; Hopkinson, 2018; Chizaryfard et al., 2021). The last and perhaps most relevant set of barriers (i.e., socio-behavioural behaviours) for the thesis concerns social and behavioural changes required on behalf of consumers. For instance, the existing consumption patterns among people in the Global North favour overconsumption and link the possession of certain goods (e.g., clothing, vehicles, or jewellery) with a person's identity and social status (Lofthouse & Prendeville, 2018). Similarly, the lack of skills, information, and low product quality can all hinder attempts of consumers to uptake and engage with practices like repair and reuse (Niskanen et al., 2021).

## 3.3.6 Critique of CE

Until recently, the CE discourses have mainly been influenced and even dominated by business and industry practitioners. However, several major concerns and critiques arose with the increasing interest of academic researchers in the CE principles, practices, consequences, and different routes for implementation (Korhonen et al., 2018).

According to Calisto Friant et al. (2020), while the CE concept is accessible and easy to follow due to its lacking roots in any particular theory, philosophy, or politico-economic model, it suffers from many systemic challenges and inconsistencies. For example, the premise of CE overlooks the laws of thermodynamics by creating visions of an utterly waste-free future in which products cycle in indefinite loops and omits the challenges of the gradually decreasing quality of materials over prolonged use, sharing, or through remanufacturing (Corvellec, Alison, and Johansson, 2021). Additionally, Murray et al. (2017) argue that the CE concept applies an overly simplistic perspective on the sustainability of circular solutions and is yet to resolve the issue of transitioning to green technologies that also require virgin resource extraction and lead to damage of environmentally significant locations and capital. Finally, most existing CE cases and implementation strategies come from developed countries of the Global North. This tendency results in neglecting CE as a global project and excludes the needs, local visions, and indigenous circular strategies of communities in the Global South (e.g., Kirchherr & van Santen, 2019; Corvellec, Stowell & Johansson, 2021).

Several scholars (e.g., Murray et al., 2017; Lofthouse & Prendeville, 2018; Schulz, Hjaltadóttir & Hild, 2019; Corvellec, Alison & Johansson, 2021) have also warned against the preoccupation of CE with technological and manufacturing solutions, which has led to a missing discussion on its social dimension. Moreover, being primarily an economic model, CE lacks visions for achieving a more just, inclusive, and equitable society, a necessary condition for sustainable development (Murray et al., 2017). Likewise, the absent broader social perspective also means that within a CE, citizens are considered mainly as consumers, playing a relatively passive role despite having to adjust to new practices and ways of living (Schulz, Hjaltadóttir & Hild, 2019).

#### 3.3.6.1 From circular economy to circular society

The social limitations of the CE, inspired several scholars (e.g., Calisto Friant et al., 2020; Jaeger-Erben et al., 2021; Melles, 2021; Clube & Tennant, 2023) to introduce and explore the concept of a circular society (CS henceforth). Compared to the technological and market-based focus of CE, the idea of a CS argues that circular transitions are socio-ecological and require, therefore, the involvement of all societal actors (Jaeger-Erben et al., 2021). In other words, the transition to circularity cannot be limited to new manufacturing methods or sustainable materials but must lead to the design of new social practices, norms, and values centred around circular thinking and doing (Social Design Lab, 2021)(Figure 13). According to Jaeger-Erben et al. (2021), this paradigm shift is challenging as it requires debates on how economies can support various types of consumption within planetary boundaries, which would, besides the embraced principles of efficiency and consistency, require an additional focus on sufficiency (e.g., through practices of repair or sharing). The notion of sufficiency ties the CS concept closer to the de-growth theories that argue for needs-based consumption achieved by strategies such as consumption corridors (Büchs & Koch, 2019; Barros & Richard Wilk, 2021).



Figure 13. The difference between Circular Economy (CE) and Circular Society (CS) (Calisto Friant et al., 2020, p10). Adopted and modified by the authors.

Calisto Friant et al. (2020) conducted an extensive literature review to understand the similarities and differences between the existing CE and CS discourses. As a result, they identified four major circularity discourse categories (Reformist CS, Transformation CS, Technocratic CE, and Fortress CE) based on their focus (i.e., focus on economy vs focus on society) and approach to the decoupling environmental impact from growth (optimistic or sceptical) (Figure 14).



Figure 14. Visual representation of the four circularity discourse categories (Calisto Friant, 2022, p 197).

The plurality of CE and CS visions is not necessarily problematic. Afterall Calisto Friant et al. (2020), alongside other scholars like Verweij et al. (2016), suggest that different discourses can lead to a more nuanced and better understanding of sustainability policies, foster system thinking, encourage democratic debates, and stimulate the imagination of plural futures - all of which allow service designers to enter the CE (and CS) field. So, to help us navigate the complex topic of circular society, we plotted our literature search findings into a mind map (Figure 15), identifying several key themes for circular society, such as a paradigm shift, the importance of an inclusive approach, or the need for changing practices and behaviours.



Figure 15. The group's circular society mindmap

# **REFLECTION**

Having addressed the important and emerging research into CS, we will continue using the term 'Circular economy' but extend it with our understanding of its close link to the society in which it is nested. In practice, we will do this in multiple ways. First, our surveys and interviews with service designers will focus on the social dimension of CE and social sustainability to understand how customers and other social actors are involved, participate or co-design circular solutions. Furthermore, throughout this thesis, we will engage with citizens to understand their current practices, view on circular consumption, or ideas about circular futures. Finally, our thesis topic is inherently looking at the implication of social differences on design and implementation of circular solutions.

#### 3.4 Circular economy and gender

The critique of the CE and emerging ideas of CS show that if the basis of a future sustainable society includes CE principles, CE scholars and practitioners must engage in discussions on needed shifts in social, economic, and political paradigms (e.g., critically question the possibility of green growth or explore gender inequalities of CE solutions) to avoid further polarisation and inequalities (Corvellec, Alison, and Johansson, 2021). When it comes to gender, the sensitivity to experiences, struggles, and needs of different genders is currently underdeveloped and largely missing in both CE policies and practical circular applications (Middlemiss, 2018; Pla-Juliána & Guevara, 2019; Bloodhart & Swim, 2020). At the same time, there is growing evidence (e.g., OECD, 2021; Middlemiss, 2018) that women are disproportionately affected by both climate change and sustainability policies. For example, women and girls are worldwide more dependent on natural resources and deliver larger quantities of unpaid labour, some of which are also related to sustainable and circular practices (e.g., recycling, managing food, and small repairs) (OECD, 2021).

The literature shows that gender differences play a role in both the production and consumption parts of the economy. When it comes to circular production and manufacturing, women outnumber men in low-value circular activities (e.g., recycling, waste management), whereas men are more likely to engage in high-value tasks of design and development of design solutions (Albaladejo, Arribas & Mirazo, 2022). These differences are especially problematic in the Global South, where, for example, around 60% of Vietnamese women working within already precarious waste management jobs are also exposed to dangerous pollutants (Weisen, 2022). In the case of consumption, research shows that women are also more likely to engage in sustainable (e.g., buying ecological products, reading product labels) and circular practices (e.g., water saving, recycling, buying second-hand) compared to men (e.g., Middlemiss, 2018; Pla-Juliána & Guevara, 2019; Bloodhart & Swim, 2020; Odrowaz-Coates, 2021).

While these differences can place women and girls at the forefront of the sustainability transition, gender inequality leads to several risks. Firstly, women do not hold the same power as men, and although women dominate among climate activists, they are underrepresented in politics, company boards, and other decision-making bodies (Odrowaz-Coates, 2021). Secondly, the feminisation of care (e.g., for children, the elderly, or animals) is problematic as it creates a risk that the household transition to circular and sustainable practices will lead to an additional amount of unpaid labour already performed by women (Middlemiss, 2018; Pla-Juliána & Guevara, 2019). Lastly, women are targeted differently by companies selling circular and sustainable products. Given that women are more inclined to act sustainably and often make purchase decisions for their households (as part of their unpaid labour), they are subject to marketing stereotypes (e.g., all women care) and campaigns.

"Systematic incorporation of a gender lens in the circular economy design – understanding consumer behaviours, integrating lessons learnt from traditional sustainable practices, of which women are often knowledge holders, and leveraging local value chains for sustainability – would not only ensure a "just transition" for all, but would also inform how to make the new economic paradigm operational and sustainable." (OECD, 2011, slide 12). As service designers begin to move into designing circular and sustainable solutions, they must consider the inequalities and disadvantages of the existing social structures. However, as we mentioned in subsection 2.4.4., gender is only one factor influencing people's everyday experiences, and designers must be aware of (and perhaps also trained to take) a more intersectional perspective.

## 3.5. Service design and circular economy

This final theoretical section investigates the role and position of Service Design (SD henceforth) within a CE context, presenting insights from a literature review followed by key learnings from a practitioner survey and interviews (section 3.8 and 3.9).

Assuming that SD is well-positioned to support the transition to CE by including user-centred perspectives, crafting services for new circular practices, and creating preferable visions of circular futures (e.g., De los Rios & Charnley, 2017; Kongelf & Camacho-Otero, 2020; Fleishman, 2020), the reviewed literature seems to pay little attention to the field and focuses instead on new opportunities and demands for industrial and product design. Although this gap could be explained by the SD's relatively short history (e.g., Yu and Sangiorgi, 2018), it might also suggest missing design competencies, tools, and processes for navigating the complexities of CE transitions. Furthermore, the above-mentioned critique of CE, mainly its lacking social and behavioural dimensions (e.g., Murray et al., 2017; Lofthouse & Prendeville, 2018), might have also led to prioritising technical and functional aspects of circular solutions over their desirability and user-centredness, resulting in lesser engagement with disciplines like SD.

Therefore, the literature seeks to answer the following questions to create a more holistic image of the SD position within the CE context:

- What is the current SD involvement in CE?
- What are the competencies and tools service designers can apply to operate successfully within the CE context?

The review insights are presented in the following two subsections, reflecting the order of the two research questions, with each subsection structured around several key themes.

#### 3.5.1 Service design within the CE context

We have previously (subsections 2.2.3. and 2.3.2.3) elaborated on the transformational potential of SD and its role in designing sustainable consumption. Therefore, the following subsections will provide only a brief introduction to SD within the CE context, focusing primarily on product-service systems (PSS) and the possibilities of SD to drive more human-centric circular solutions.

#### 3.5.1.1 Product-Service Systems (PSS)

Several policies and guiding documents (e.g., the EU Green Deal) highlight the role of design in transitioning toward new production-consumption systems based on circularity principles (e.g., Sumter et al., 2020; CEPS, 2020; EU, 2023). Next to new guidelines and manifestos for industrial, urban and product design (e.g., to improve product longevity or upgrades), the involvement of service design seems to mainly focus on the development of product-service systems (PSS). According to Ceschin (2015), PSS could be explained as value propositions that offer products through various combinations with services (e.g., pay-per-use home appliances) instead of selling

them to customers. Depending on their position on the PSS continuum (Figure 16), PSS are either product-oriented (e.g., selling products but adding repair, recycle, or upgrade services), Use-oriented (e.g., renting or leasing products to consumers) or Result-oriented (e.g., selling function as in pay-per-use services) (Wallin, Chirumalla & Thompson, 2013) In other words, PSS enables businesses to rethink ownership by introducing a variety of new forms of accessing, using, maintaining, and paying for products and services (e.g., leasing cars, sharing office space, and renting clothes) (Trimingham, 2015; Fleischmann, 2020).

Therefore, in combination with repairable products designed for longevity and technological updates, PSSs are considered a promising way to achieve sustainability (Ceschin, 2015; Tukker, 2015). However, although the concept of PSSs date back to the 1990s, their implementation and uptake remain relatively limited and linked to numerous barriers, including resistance and difficulties in changing habits and routines on the consumer side (Ceschin, 2015; Poppelaars, Bakker & Engelen, 2020). In the following subsection, we will explore how SD can help with the latter by encouraging a holistic and human-centred perspective in the design of circular solutions.



Figure 16. Schematic representation of PSS continuum (Wallin, Chirumalla & Thompson, 2013, p265).

#### 3.5.1.2 Applying a human-centred perspective

Traditionally, the focus of CE was mainly on the production and managerial side, resulting in a relatively small body of research on circular consumption and the implications of CE into everyday life (Camacho-Otero, Boks & Pettersen, 2018). However, the role of consumers (referring broadly to customers and citizens in general) is central to successfully implementing circular policies and business models, as the CE requires people to adopt new consumption practices and behaviours. For example, activities like sharing or extending the product life cycle through regular care and repair are only possible if people are capable, motivated, and have the resources to engage in them (Wastling, Charnley & Moreno, 2018). However, many types of unsustainable consumption practices are not a result of individual choices but are also reinforced through the existing infrastructure (e.g., missing recycling infrastructure), technologies (e.g., variety of home appliances), or institutions (e.g., tolerant policies for cars in cities) (Truong et al., 2022).

Against this background, service design should be well-positioned to support the CE business models and policies by ensuring a human-centred perspective of proposed circular solutions or even anticipating future needs. For example, Andrew (2015) suggests that by applying design thinking, designers can prepare the groundwork and possible roadmaps for developing an alternative (i.e., circular) economy and brainstorm roadmaps for changing consumer behaviour. These could imply focusing on challenges of customer acceptance (e.g., shifting from new to used products) or creating value propositions for access- rather than ownership-based business models (e.g., pay-per-use, leasing, sharing) (Kongelf & Camacho-Otero, 2020). Lastly, given that service designers are trained to consider different service levels and dimensions (as proposed by Patricio et al., 2011), they can support a more holistic perspective that not only considers the interplay between the individual needs and the broader sociotechnical infrastructures but also pays attention to the temporal dimension of product use (e.g., multiple use and prolonged use) (Lofthouse & Prendeville, 2018).

#### 3.5.2 Circular design competencies and tools

Now that we have established a theoretical ground for service design in CE (in its broader social dimension), the question remains - which competencies and tools do service designers need and use when working on circular economy projects?

Although designers are considered important actors in transitioning to and implementing CE, more research must be dedicated to debates on the necessary competencies and skills for designers and how these are obtained through design education and practice (Summer et al., 2020). For example, design for sustainability (or, more specifically, circularity) is not a mandatory part of most design education or is mainly focused on product-oriented sustainability (e.g., choice of materials) (Andrews, 2015; Micklethwaite, 2022). Therefore, in this subsection, we will briefly consult existing academic literature and practitioner guides to uncover the main competencies and tools associated with design for circular solutions.

#### 3.5.2.1 Circular design competencies

Our investigation showed that there is no set of clearly defined circular design competencies but rather that their list continues to evolve alongside the changing role of designers (e.g., from designing interaction to designing for social structures). Furthermore, as we described in our findings in section 2.2, service designers (and many other design professionals) come nowadays from many different backgrounds, meaning that their competencies might be harder to measure, compare, or assess. Lastly, the lack of research on CE and SD means that SD students and practitioners do not typically have access to SD-specific information on ways to develop and foster needed competencies for circular and sustainable design.

Despite these challenges, we discovered several sources (e.g., Sumter, 2020; Koning, 2021; Sumter, 2021; Design Council, 2021; DDC, 2022) discussing the important skills, know-how, attitudes, and knowledge designers need to be successful in designing circular solutions. Although several of these were developed with the product and urban designers in mind, we believe that they are also relevant for service designers. Therefore, we will provide several examples in the following paragraphs:

> "Designing for sustainability is not, therefore, about designing sustainable things, but designing to enable sustainable ways of living, and designing social and technical systems that can allow that." (Micklethwaite, 2022, p2)

#### • Circular system thinking

The need for system thinking was mentioned by several authors (e.g., Sumter, 2020; DDC, 2022), especially in terms of gaining a holistic perspective or moving beyond individuals to consider broader structures and systems. In the CE context, the systemic perspective is expected to aid designers in zooming between the product and its wider context, understanding flow of materials, and navigating different market and business objectives (Sumter, 2021). In their Net Zero report, Design Council (2021) expands this perspective to include root-cause analysis, observations of system behaviour, inclusion of various stakeholders (e.g., marginalised groups, non-humans), or skills to navigate the complexity of working at different system levels.

#### • Circular strategy skills

The group of circular strategy skills is broad, involving the designer's abilities to engage with top-down and bottomup change processes (Sumter, 2021). Here, designers can apply their strategic skills to forge important partnerships, understand barriers and opportunities for change, or work with policy initiatives (Design Council, 2021). In the commercial settings, designers can help companies and organisations in setting up design experiments and pilots to test new strategies for accelerating their circular transition (DDC, 2022).

#### • Impact assessment skills

Another key group of competencies includes knowledge and skills to evaluate the social and environmental effects of design solutions (Design Council, 2021). Within product design, this is often achieved by identifying circular indicators or criteria and by evaluating the impact generated through multiple use cycles (Sumters, 2021). For the needs of service design, Sierra-Pérez et al. (2021) proposed enhancing the process of service conceptualization by including environmental requirements and spotting opportunities for improvement by tracking various behavioural

(e.g., people not handling rental bikes with care) and environmental barriers (e.g., rental bikes are collected by a van). Similarly, Dokter et al. (2020) reported strategies used by design agencies and start-ups, including developing their own circular guides and circular design brief templates, or investing in building smaller expert teams. However, Sumters (2021) and Penin (2018) point out that the existing assessments performed by designers are often superficial and that more robust training and guidance is currently missing, especially for service designers. In addition, we note that the reviewed literature did not mention any specific ways for measuring social impact other than including diverse stakeholders.

### • Collaboration and storytelling

The previously mentioned role of designers as change agents means that designers often act as facilitators for adopting a more circular mindset and help establish a clear overview of involved stakeholders (e.g., through stakeholder mapping). Furthermore, they can drive co-creation processes or support businesses and citizens in envisioning possible circular futures (Dokter et al., 2020; Sumters, 2021; Design Council, 2021). Sumters (2021) also mentions the need for communication skills to drive 'circular storytelling', which refers to building a shared comprehensive circular vocabulary and managing different stakeholder perspectives on CE.

# REFLECTION

When researching design competencies, we often reflected on the dichotomy of designers as generalists and specialists. While the Master's studies gave us a perspective of designers as generalists by engaging with different types of projects (e.g., commercial and non-profit), the process of writing this thesis raised an important question about the extent service designers can afford to stay generalists when dealing with sustainability and circularity. While the fundamental service design competencies (e.g., facilitation, uncovering user needs, or visualising processes) allow designers to engage with a variety of different projects and industries, assessing the environmental impact or developing circular vocabulary requires a more specialist approach. In fact, we believe that this extends to other fields relevant to service design (e.g., Al, human rights, healthcare), where designers must obtain a certain level of knowledge to meaningfully engage in design research and conceptualization.

#### 3.5.2.2 Circular design tools

Finally, we searched for tools service designers can use, test, or adapt to support their work with CE projects. Although there are many available toolkits and frameworks aimed at business, we looked specifically for those directed to designers or individuals and teams working with the development of circular solutions. Given our limited budget, we reviewed only a selection of freely accessible and downloadable tools (see Table 4).

Toolkit	Author
Systemic Four	Future Urban Living
Circular Design Toolkit	Ecodesign Circle
Use2Use Design Toolkit	Anneli Selvefors and Oskar Rexfelt (Chalmers University, Swe- den)
The Circular Design Guide	Ellen MacArthur Foundation and IDEO
Designing Your Circular Transition	Danish Design Center
Circular Design Thinking Canvases	Innodriver
Transition Journey	Service Design Tools

Table 4. Overview of reviewed resources and toolkits

Our review showed that most tools looked at supporting designers throughout several stages of their design process (e.g., brief, ideation, value creation, prototyping), focusing mostly on helping them to extend the existing offerings (e.g., through servitization), consider circular flows and journeys (e.g., exploring challenges tied to multiple uses), or support their strategic discussion with clients and other stakeholders. Several tools also mentioned or provided tips on acquiring important design skills, such as systemic thinking, understanding impact, or supporting strategic decision-making.

Although not all toolkits were directly aimed at service designers (besides the Transition journey by Service Design Tools), some included tools like service blueprints, personas, or journey mapping. Finally, besides the Use2Use toolkit, which directly focuses on user-centred circularity, the toolkits included some amount of reflections and reasoning about the user perspective. These could include questions about the possible impact of proposed solutions or ways to help users meet their needs. However, these prompts were not vastly different from other design tools, which might suggest an oversimplified view of the scale of transition people must undergo to significantly reduce the impact of their everyday consumption. Finally, the tools did not include any prompts or cues for designers to consider their own or project biases.

# REFLECTION

Nowadays, service designers can find a number of accessible toolkits to help them plan for, strategize, and design circular solutions. Given that most tools come in the form of editable templates (e.g. in Miro or Mural), designers can adjust and apply them in a manner that fits their needs. However, looking through the tools, they seem to be designed to fit specific types of project briefs (e.g., adding services to existing products) and might be less applicable to more explorative and radical circularity projects.

Furthermore, we also reflected on the missing focus on social differences across all toolkits. For instance, the Use2Use toolkit, which has been gaining traction in Sweden (Chalmers, 2023), focuses specifically on enabling customers to act more sustainably but does not have (to our knowledge) any established system for assessing the impacts of social differences. In fact, while writing this thesis, we reached out to one of the authors of the toolkit, who declined the interview on the basis of lacking experience in working with the topics of gender, ethnicity, or justice in sustainable consumption. This provided additional motivation for our project to support the design community by immersing ourselves in the complex topic.

#### 3.6 Practitioner survey

To complete the initial exploration of the service design role within a CE, we decided to conduct a survey that focused on understanding the capabilities, skills, and tools service designers need when working on CE projects. We chose the survey method for its ability to collect larger data samples and help us quickly test our assumption from our desk research. Furthermore, we wanted to lower the barrier for designers to participate in our research by offering a less time-consuming activity than in-depth interviews.

As we were interested in both existing and anticipated needs, we created two survey versions (Appendix 2 and 3). While the first aimed at service designers with some experience working on CE projects, the second was aimed at designers without such experience but wanting to work with the CE. To enable comparison between the two target

#### groups, both survey versions contained topics centred around the following main research questions:

- What are the main capabilities and tools service designers need (or anticipate to need) when working with CE projects?
- What are the main challenges (or anticipated challenges) service designers experience in relation to CE projects?
- To what extent is social sustainability considered in organisations as part of CE projects? To what extent is it integrated into the circular design process?

Based on the literature review, we formulated several assumptions about how service designers perceive their role and competencies for engaging with sustainability and CE projects. Given the broad focus of this initial survey, we allowed ourselves to formulate some of the assumptions more categorically, assuming, for example, that designers do or do not have the right design tools.

The survey assumptions were the following:

- Service designers working (or wanting to work) on CE projects typically have more years of experience.
- The most significant barrier for service designers working (or wanting to work) on CEy projects is the need for more knowledge and access to more appropriate design tools.
- System thinking and understanding of the economy are likely among the most needed and, at the same time, lacking capabilities.
- Service designers understand the concept of a CE as primarily linked to ecological sustainability and struggle to assess the impact of their design.
- Standard service design tools (e.g., customer journeys, personas, service blueprints) developed within a linear economy mindset are less likely to be used for working (or aspiring to work) with a CE. This means that designers develop their own tools or use tools available online.
- Service designers are focused (or are expected to focus) primarily on technological and logistic elements of the CE, paying less attention to the social dimension of circularity.<sup>1</sup>

#### 3.6.1 Survey set up

The survey was created in SurveyXact software and distributed through various groups addressing service design or circular economy on LinkedIn and Facebook. The survey contained informed consent on the introduction page and explained how the collected data would be used in the project. To ensure higher reliability of the survey results, we also specified that participants (in both surveys) could be students, academics, or professionals but must be working with service design. However, we were also aware of the limitations in the sample selection. For instance, not all service designers working with the circular economy use LinkedIn or are members of the selected groups. Moreover, many professionals might use service design tools in their daily work but either do not see themselves as service designers or connect these with other design disciplines and branches (e.g., as exemplified by Ehn, de Götzen, Simeone & Morelli, 2021).

As mentioned above, we aimed to create an engaging and relatively short survey, considering our participants' possible lack of time and oversaturation of student surveys and requests for feedback in social media groups. Therefore, both surveys comprised 15 questions, most of which were single- or multiple-choice and rating questions. We reserved the use of open-ended questions only for specifying selected choices or providing concluding thoughts and reflections (see Appendix 4).

# 3.6.2 Survey results

Despite the high volume of impressions of the survey posts in large design communities on LinkedIn and Facebook (e.g., Circular Design group with 37.000 members), the total number of respondents completing the surveys was relatively low (n=12 in both surveys). While this might suggest issues with the posts' visibility, the drop-out rate (approximately 50% in both surveys) also points to possible barriers within the survey design.

The following subsections will present the survey findings, starting with the respondents' demographics and

<sup>1</sup> This thesis is structured to group relevant activities (e.g., interviews, literature research findings) rather than strictly following chronological events. This means that at the time of the survey distribution, we have just begun considering gender as a specific factor in the circular design. Therefore, the survey did not directly contain any questions about gender (and gender differences) but focused more broadly on the social dimension of circularity.

professional backgrounds. When presenting the key findings, we will first focus on presenting insights about service designers working with CE projects, followed by a comparison with the data from the second target group.

#### 3.6.2.1 About service designers working with CE projects

Most survey respondents (67%, n=8) identified themselves as women and reported working as service designers. Two participants selected other job roles, namely User Researcher and Experience Designer. In terms of their seniority, the respondents represented a mixed group with various years of experience, ranging from students and entry-level designers (25%, n=3) to professionals with over ten years of working experience (33%, n=4). Similarly, industries in which the responders reported working varied, with the majority (33%, n=4) employed in IT and Digital technologies, followed by consulting (17%, n=1). Lastly, not all respondents frequently worked with CE projects, and over 35% (n=2) reported only occasional or rare engagement on such projects.

#### 3.6.2.2 About service designers without experience of working with CE projects

The second responder group (n=12) was constituted mainly of women (83%, n=10), and half of all participants (50%, n=6) listed their current role to be service designers. In terms of seniority, the majority were entry-level designers (58%, n=7), followed by professionals with 3-5 years of experience (25%, n=3).

# REFLECTION

Understanding the diverse backgrounds of the survey respondents taught us that we could not treat the results as representative of service designers as a professional group. Furthermore, the final data sets were relatively small, preventing further stratifications (e.g., based on job role or years of experience) and meaningful comparisons between data subsets (e.g., comparing entry-level designers with seasoned professionals). Therefore, we decided to use the results as explorative input to our further research and as discussion points in later in-depth interviews.

#### 3.6.2.3 Key capabilities and tools

The survey explored what capabilities service designers deem crucial when designing circular solutions. In line with other scholars (e.g., Morelli, de Götzen & Simeone, 2021), we regard capabilities<sup>2</sup> as a broad category, including talents, skills, knowledge, know-how, and abilities that service designers apply to manage resources effectively in various situations and contexts. In the survey, capabilities like engaging in cross-disciplinary collaboration (92%, n= 11) and applying system thinking (83%, n= 10) scored the highest. Furthermore, the need for future-oriented thinking (67%, n=8) and understanding of business and economy (67%, n=8) were among the top capabilities. In addition to the capabilities listed in the survey question, one participant added the ability to stay resilient and have courage. This feedback helped us reflect on possible interpersonal skills and psychological strengths designers engaged in sustainability transition projects might need to acquire and foster if they are to maintain their own personal and professional well-being.

In line with designers experienced with CE projects, service designers in the second group reported the same top capabilities, which they anticipated to be among the most critical when designing circular solutions. Once again, cross-disciplinary collaboration (92%, n= 11) and applying system thinking (83%, n= 10) were rated highest, followed by future-oriented thinking (75%, n=9) and understanding of business and economy (67%, n=8). Interestingly, the need for understanding materials and manufacturing processes (67%, n=8) was higher in this group than among designers with CE experience (33%, n=4). This difference could be ascribed to the material- and technological focus of the current CE debates. This preoccupation may create an expectation that service designers

<sup>2</sup> In this thesis, we treat the term capabilities interchangeably with the term competencies used by, for example, Sumter et al. (2021).

become more involved in the production and supply chains rather than on the consumption side.

Regarding the methods and tools service designers use for developing circular designs, the respondents in both groups reported utilising the already existing service design toolkits. However, an interesting difference can be found between the two samples. Service designers with CE experience selected mostly the methods of rapid prototyping (75%, n=9), user journeys and scenarios (67%, n=8), service blueprint (67%, n=8), and the use of actor maps (67%, n=8). On the other hand, service designers without CE experience anticipated a more frequent usage of actors map (100%, n=12), brainstorming (92%, n=11), value proposition canvas (83%, n=10), and charting of material flows (83%, n=10). While the samples are too small to draw reliable conclusions, they might suggest that service designers aspiring to work with circular solutions envision their involvement earlier in the design process.

#### 3.6.2.4 Main challenges and barriers

Besides capabilities, the survey investigated professional challenges and barriers service designers experience when working on CE projects. As expected, the difficulty of assessing the impact of proposed circular solutions (58%, n=7) was reported as the most significant barrier, followed by the lack of support from relevant decision-makers (50%, n=6) and knowledge or interest in a CE within their organisation (50%, n=6). However, the list of barriers was too limited, and half of the respondents (n=6) listed additional reasons like navigating regulations, a too narrow focus on certifications, low demand for circular projects, or the lack of patience to design for long-term impact.

"My company wants to get the B-corp certification. But, unfortunately, it is more about chasing the label and ticking the boxes than wanting to make the change."

"Making the business case for financial profit is always in focus."

"Getting the right end users on the customer side for interviews is challenging."

Considering challenges and barriers anticipated by service designers aspiring to design for a CE, the lack of support from relevant decision-makers (75%, n=9) remained the most significant challenge, followed by the perceived lack of knowledge (67%, n=8), challenges in assessing the impact of circular solutions (67%, n=8), and difficulties dealing with policies (67%, n=8). When asked to rate how well equipped (in terms of education, tools, and training) they see themselves for working with CE projects, the majority (83%, n=10) oscillated between relatively unequipped to moderately equipped. Together, these results suggest that service designers might be unsure about their preparedness to work with sustainability transitions which, in return, provides an opportunity for design schools to address these issues in their curricula.

#### 3.6.2.5 Focus on social sustainability

Finally, inspired by the lack of social dimension mentioned in the critiques of the circular economy (e.g., Corvellec, Alison & Johansson, 2021), the survey asked for a reflection on the extent to which social sustainability and social justice are considered or integrated into circular economy projects. While more than half (58%, n=1) agreed that these are (or must be) incorporated, the rest (42%, n=5) saw this connection as more ideological and currently less profound.

"Social sustainability and social justice should be integral parts of the circular design process. After all, circular design is meant to bring well-being to people and the planet. Nevertheless, in practice, these concepts are not always considered first, as practitioners tend to prioritise other aspects such as material flows, technological feasibility, adaptability to current manufacturing lines, and scalability during the design process. This might point to a failure to think holistically, as it is presumed that certain things have precedence before others."

"They have to be integrated as a checkpoint throughout the project at different stages."

"Ideally, but i have not seen this in practice"

"I believe as a service designer we have the moral obligation to shape the possible, and we have to create and leverage the path for a more sustainable way of living. It is very important that the companies and the citizens understand the importance of the circular economy and the impact capitalism (and compulsive consumerism) has nowadays."

## 3.6.2.6 Conclusion and next steps

Although the final number of survey responders was lower than originally expected, given the distribution in large social media groups, the survey helped us qualify several assumptions about the existing and anticipated role of service designers in the CE.

- Firstly, the ambition and likelihood to work on CE projects were not correlated with responders' increasing seniority. Instead, capabilities like system thinking and cross-disciplinary collaboration were endorsed as must-have competencies.
- Secondly, several service designers reported a lack of knowledge, tied especially to their understanding of the economy and their ability to assess the impacts of proposed solutions.
- Additionally, the survey showed that the existing service design tools and methods seem to be sufficient and translatable to designers' needs for working on CE projects.
- Finally, the survey debunked the assumption that service designers do not consider and engage with social and behavioural aspects of the circular economy. However, the extent to which these are explored and integrated is often limited by organisational barriers or limited to selected goals (e.g., certifications). Furthermore, it remains to be investigated how exactly service designers explore social differences in their works. If we are to reflect on the review tools for circular design, this reflection might still be superficial as equal to simply asking what needs would a given service offering solve for the users.

# **3.7 Expert Interviews**

As an extension to the survey and to better understand the focus on the social dimension of the CE, we conducted several in-depth interviews with academic and non-academic professionals (participants henceforth) who focus on or hold knowledge of service design in relation to the CE. We chose the method of an in-depth interview for its ability to provide rich insights, often collected by talking to experts in a given area, through a semi-structured format (Stickdorn et al., 2018). However, according to Björnen (2015), there are challenges in using in-depth interviews, especially if there is a broader knowledge gap between the interviewed domain expert and the less experienced interviewer. We mitigated this risk by planning the interviews after the literature review and practitioner survey to obtain a broader understanding of the social dimensions of a circular economy.

# 3.7.1 Interview structure

A total of five participants were recruited using a written invitation distributed to the email address provided in the survey and on the AAU website. Each interview lasted 30 to 40 minutes and was conducted individually. The interview guide was divided into two parts, exploring two specific research focuses (Appendix 5). First, we introduced the results from the survey, asking participants to reflect on and challenge our findings based on their professional experience. In addition to the survey findings, we were interested in exploring the possible reasons behind a relatively low number of service designers (or service design studios and teams) focusing on design for a CE. Second, we presented participants with the concept of a circular society (CS henceforth), focusing primarily on the challenge of transitioning from the current ways of living and doing to more sustainable ones. Here, instead of introducing the different CS discourse, we framed the discussion around enhancing design focus on the social dimension of the CE (e.g., considering how circularity shapes everyday life). As we only had a limited time, we asked the participants to share their immediate thoughts on the issues and consider the role service design could play in enhancing the social perspective in the CE transitions. Table 6. An overview of the recruited academic and non-academic professionals

#ID	Background information	Gender <sup>3</sup>	Interview format
E1	Ph.D. Researcher at AAU (Denmark)	Woman	In-person
	<u>About the expert:</u> This expert is trained as a service designer and has both knowledge and some experience working with circular economy projects. Furthermore, E1 has experience in teaching circular economy to design students. At the time of our interview, E1 was still involved in sustainable design research but focused less on the topic of a circular economy		
E2	Designer and Partner at a design studio (Belgium)	Woman	Digital
	<u>About the expert:</u> This expert has previously worked on circular economy projects and is also involved in various social innovation projects. Furthermore, this expert teaches and applies methods of system design.		
E3	Service Design Leader for Circularity in a large international company (Netherlands)	Woman	Digital
	<u>About the expert:</u> This expert has transitioned into service and system design from humanities. As an employee in a large international company, E3 works with the implementation and blue- printing of the company's buy-back system for used products. At the time of our interview, E3 was also preparing for a sharing session to introduce circularity to other departments.		
E4	Senior CX and Service Design Consultant in a large international consultancy house (Saudi Arabia)	Man	Digital
	<u>About the expert:</u> This expert is trained as a service designer and works with a circular economy in business-to-business consulting. E4 has also experience working on service design tools for transition design. Besides that, E4 has also encountered projects focusing on social innovation.		
E5	Ph.D. Researcher at AAU (Denmark)	Woman	Digital
	<u>About the expert:</u> This expert is trained as an experience designer and transitioned to service design during her research work. E5 is currently involved in a research project exploring the interpretation and sense-making of circular urban strategies within local contexts.		

# 3.7.2 Findings

The interview analysis showed that the participants had previously engaged with CE projects in different design settings and development levels, from exploring early CE principles in local settings to designing concrete blueprints for implementing buy-back systems. Although not all participants were directly involved in CE projects at the time of the interviews, they all expressed a great interest in the topics of circularity and sustainable consumption.

The following subsections will focus on exploring the main themes derived from the interview analysis that, although introduced here separately for analytical reasons, were, in fact, mostly overlapping and interconnected during the interviews.

#### 3.7.2.1 Reflections on the survey results

In the first portion of the interview, we asked participants to reflect on the main findings of our survey, especially the insights about the key capabilities, experienced barriers, and applicability of the existing service design tools to CE contexts. This overview allowed participants who previously answered the survey to clarify their responses further while the rest reflected on their professional peers' opinions.

Regarding the core capabilities, all participants agreed on the need for a systemic approach to spot intervention opportunities. Besides allowing designers to 'see a bigger picture,' system thinking was also regarded by some as a competence that designers uniquely bring to their team, suggesting that designers might be bearers, cultivators, and promoters of systemic approach in their interdisciplinary teams (e.g., engineers, content designers, project owners). The participants also listed similar key barriers to those highlighted by the survey but also added additional ones. For example, Participant E3 talked about struggles to promote a circular approach in a large company where not all departments know the concept. At the same time, Participant E2 described tensions between conflicting business goals (e.g., to design for disassembly while keeping the lowest possible manufacturing cost).

Interestingly, the survey participants reported a need for new service design tools for better visualisation of complex systems and their transitions to circular states. When asked why they did not add these reflections to the survey and instead selected options with existing service design tools, they listed lack of time as the main reason. This was an important finding that did not make us distrust the survey results but to adopt a more critical approach to them. From the interviews, we could understand that the existing service design tools as still needed and used (e.g., personas,

<sup>3</sup> We decided to include the gender of the experts throughout the thesis as they provide a clearer image of the expert group (e.g., primarily women). The gender was collected during their presentation but also throughout their reflections (e.g., "Well, I am a woman working in a team with mainly men").

service blueprints), but in practice, they are complimented with additional systemic tools (e.g., intervention maps and circularity loops) and process tools (e.g., material flows).

## 3.7.2.2 The profit-driven focus in circular transitions

Regarding the frequency of working on circular projects, the participants could be divided into two groups. Some participants worked with circularity regularly as they were members of circularity teams and research projects, while others engaged with circularity on a more irregular project and assignment basis. However, both groups experienced challenges in securing buy-ins from decision-makers who are still predominantly driven by profits linked to production-consumption models of the linear economy. For example, Participant E4 revealed that focus on a circular economy is rarely mentioned or requested in client briefs. However, the consultants try to bring opportunities for more circular processes in incremental rather than radical ways. In other words, the consultants present possible circular solutions through implementable prototypes rather than long-term future visions. Similarly, Participant E3 reflected on the narrow idea of financial profitability that is currently the primary measurement for evaluating the success of the circular solutions developed within their organisation.

## 3.7.2.3 The missing human-centred perspective

All participants agreed that service design is well-positioned to aid the CE transition, especially when enhanced with system thinking. Embracing a holistic perspective by zooming in and out between different system levels allows the participants to look at the whole system while also noticing fundamental details. Furthermore, service design actively explores temporal changes (i.e., how a service is used over time), which is crucial to imagining ways products can be used over multiple use cycles or longer time. For instance, Participant E3 shared details about their organisation's experiments to test customer experience in their new retail concept, selling and buying back only second-hand and upcycled products.

However, most participants admitted that a human-centred (and even the narrowed user-centred) perspective is less in focus as the companies are primarily occupied with building the needed infrastructures, exploring partnerships with relevant stakeholders, or planning optimal material flows. According to Participant E1, these findings might explain the low numbers of service design jobs and positions within circularity teams. Reflections like these also made us reflect that the idea of making irresistible circular services might risk falling into the trap of assuming that most consumers will generally accept and embrace such services.

> "We created five sustainable mindsets of customers [..] Would Gretha Thunberg shop in our store? Probably not." (Participant 3)

# 3.7.2.4 Reflections on the circular society

The idea of a circular society resonated with most participants<sup>4</sup>, which could be explained by their frustration over the current technological and material nature of CE projects and their professional focus on end-users and citizens. For example, Participant E5 referenced their research project that deals with the transformation of the existing ways of building and living in cities by involving human and more-than-human perspectives in shaping the principles (e.g., belonging, circularity, flow of materials) upon which European cities could build such sustainable future societies. The participants working outside academia also expressed the need for more radical changes but primarily reflected on including society in circularity based on current trends and existing concepts. To illustrate, Participant E3 explained that their organisation explores scenarios of how their business can operate within 15-minute cities or create more locally based solutions. However, Participant E3 was not involved in research or crafting these possible scenarios as the company's innovation team does this. Again, this made us reflect on the earlier survey findings that service designers might be represented in later rather than earlier stages of the design and innovation process.

"We need some new ways of facilitating creativity so that we can imagine what the transition could be like." [Participant E3, reflection over the transition to circular societies]

<sup>4</sup> It is important to mention that it was Participant E1 who recommended exploring the concept of circular society to us in response to our survey and

literature review findings. Given that the thesis is structured to group relevant activities (e.g., interviews, literature research findings) rather than strictly following chronological events, the interview with Participant E1 is placed here. However, it occurred earlier during the process.

### 3.7.2.5 The tension of wishing for a radical change

Finally, several participants wished to see and be part of more radical changes. This wish was often driven by an internal conflict of working in companies that continue to base their business models on promoting consumerism while implementing some sustainability measures. This self-reflection was also strongly tied to their identity as a 'designer for good,' which they continuously negotiated within the realities of their current workplaces. For instance, Participant E3 mentioned that despite their company taking regular sustainability actions (e.g., replacing all cow milk with oat milk in their offices), these actions are usually met with accusations of greenwashing and critical comments on social media. While wishing for more extensive changes led to a sense of sadness and powerlessness over the current state, it also brought up the notion of personal activism as part of design work.

"They would say: Yes, you replaced your milk with oat milk, but you still sell too many products." [Participant E3]

"It makes me feel so hopeless regarding the future because we are so stuck in the current system. It requires a mass paradigm shift [..] it requires everyone to come together and adopt these changes." [Participant E1]

## 3.7.3 Conclusion

We used expert interviews as the last step in our initial exploration of the project context. While they confirmed some of our literature research and survey findings (e.g., about key capabilities), they also draw our attention to the issues service designers face when acting on their assigned role of 'agents of change'. Based on the interview, we could conclude that in the context of circularity, the change is not only focused on improving the current state of services, but it is linked to a larger sense of righteousness and contribution to society, making designers into agents of a good change. With this in mind, we moved into short ideation to reach our problem statement.

#### 3.8 Initial problem statement

The literature review shows that the concept of CE suffers from the lack of attention to the social and psychological effects of the CE transition on citizens' consumption habits and practices. However, social differences, like gender, play a key role in who and how will be affected by sustainability policies and could, if not considered, prove detrimental to projects of irresistible and equal circular futures. Service designers, who are trained to apply a holistic and human-centred perspective throughout their design processes, are therefore well positioned to support the CE projects but experience a multitude of barriers. Furthermore, they might lack a deeper understanding of social differences, which might lead to their processes being focused on a 'user' and omitting the complexity of the ways social differences, like gender, shape people's everyday experiences.

Therefore, we decided to dedicate our problem statement and focus of our thesis to improving gender sensitivity in service design for a CE, aiming primarily at circular consumption.

Our initial problem statement that will guide our next steps is, therefore, as follows:

How can we use service design to discover possible differences and inequalities among women and men in the context of circular consumption?

# 4. METHODOLOGY

The previous chapters were focused on presenting our literature review findings and outlining the scope of the project context. These steps were crucial in building a thorough understanding of the problem area and the theoretical underpinnings of our initial problem statement. Standing on this foundation, we will now enter the design process, following Design Council's Framework for Innovation (Ball, 2019). We chose the framework specifically for its integration of the Double Diamond methodology (Design Council, 2017) and additional focus on employing key design principles, such as a participatory approach, collaboration, and continuous iterations.

This chapter consists of the following sections:

#### 4.1 Framework for Innovation

- 4.1.1 Introducing the Double Diamond
- 4.1.2 Key design principles
- 4.1.3 Method bank and culture
- 4.1.4 Limitation of the framework
- 4.1.5 Conclusion

### 4.1. Framework for Innovation

### 4.1.1 Introducing the Double Diamond

At the core of Framework for Innovation, we will find a design process referred to as the Double Diamond, which since its advent in 2005, has become one of the most widely accepted and frequently used frameworks among service designers (Design Council, n.d.; Penin, 2018; Stickdorn et al., 2018). This wide popularity can be explained by its simple yet effective way of dividing the complex set of design activities into several distinct phases in which designers either open their process for obtaining new insights and findings or close it to engage in sense-making and reaching decisions (Design Council, 2015). As a result, this combination of explorative (divergent) and consolidating (convergent) phases gives the model its typical diamond-like appearance (Figure 17).



Figure 17. Design Council's Framework for Innovation, adopted and modified by the thesis team.

The first diamond focuses on collecting and analysing insights obtained during primary and secondary research. The ultimate goal is to determine what is the right product or service to design. To achieve this, the first diamond begins with the Discover phase, which promotes divergent thinking and aims at gathering knowledge and data with the help of different research methods (Design Council, 2015; Penin, 2018). For example, in this thesis, we will be using a survey, semi-structured interviews, and online content analysis to gain a better understanding of the gender implications on the uptake and engagement with circular consumption. Following the Discovery phase, designers enter the Define phase, in which they deploy convergent thinking to make sense of the collected data, visualise and share key findings, and refine their problem statement (Design Council, 2015; Penin, 2018).

The focus of the second diamond is to generate concept ideas and prototypes and, through iterative methods of their selection, testing, and refinement, achieve the final design solution. In other words, the goal of this diamond is to determine what is the right product or service to design based on the obtained insights from the previous research

phases. To reach this goal, the second diamond starts with the Develop phase, which, similar to the Discover phase, requires designers to open their process and apply divergent thinking in generating numerous possible ways to solve the identified problem (Design Council, 2015; Penin, 2018; Stickdorn et al., 2018). For example, in our thesis, we engaged in internal idea generation, reviewed existing resources and tools, and talked to selected designers to collect their input. Following the Develop phase, designers start narrowing down their focus again, using divergent thinking to eliminate irrelevant concept ideas, develop and test first prototypes, and finally arrive at the most feasible, viable, and desirable solution (Design Council, 2015; Penin, 2018; Stickdorn et al., 2018).

Finally, it is intriguing to believe that following the Double Diamond phases makes the design process linear and predictable. However, as the Framework for Innovation shows, by using arrows, the process is far from being considered straightforward. Instead, designers (and non-designers) would usually revisit some of the phases, engage with more research to gather additional insights or include testing of ideas earlier (Design Council, n.d.). This flexibility of the design process is needed as it allows designers to accommodate the complexity and systemic nature of the so-called wicked problem that, compared to strictly-defined challenges in the fields like engineering or natural sciences, can never be completely solved, meaning that the solutions are evaluated in terms of their relative improvement (e.g., better outcomes) (Rittel & Webber, 1973).

#### 4.1.2 Key design principles

In addition to the Double Diamond process, Framework for Innovation introduces a set of key design principles devised to allow designers (and non-designers) to navigate the process more effectively and successfully. The principles call for designers to put people and their needs first, use inclusive and visual communication, collaborate and co-create, and keep iterating (Design Council, n.d.). In this thesis, we placed a great emphasis on collaboration and co-creation as we continuously looked for opportunities to incorporate the perspectives of both citizens and experts in shaping the research and outcome of our project. As several scholars (Trischler et al., 2018; Trischler et al., 2019; Steen et al., 2011) have noted, stakeholder involvement in the design process is not only popular but also crucial. According to Steen et al. (2011), collaborating with citizen and expert users enables designers to gain a better understanding of their needs and create a space for the experience of a reciprocal learning process to occur. We observed this firsthand during our expert interviews. Talking to designers and other experts, we learned about their processes and challenges. In return, we shared our research findings, including insights gained in those interviews. Therefore, despite interviewing each expert individually, we embodied a 'knowledge-sharing bridge' between them, which was appreciated by several of them. Finally, besides the mutual learning opportunity, stakeholder participation has also been demonstrated as a potentially effective approach to enhancing innovation within organisations (Heck et al., 2018).

#### 4.1.3 Method bank and culture

Lastly, Framework for Innovation mentions the need for deploying methods focused on exploration, shaping, and building. Translated to the Double Diamond terminology, the first set of exploration techniques refer to the primary and secondary research methods used to discover needs, challenges, and opportunities that are typically the focus of the Discover phase. Next, the shaping category includes sense-making methods and idea-generation techniques typically deployed during the Define and Develop phase. Finally, the building set of methods can be linked to the activities of the Deliver phase. However, it is important to note that this translation is only approximate. Not only can the three types of methods be deployed across several design phases, but their description provided by Design Council also remains vague (Design Council, n.d.).

Finally, the framework also calls for engaging in a collaborative and supportive working culture that allows for meaningful connections with citizens and other stakeholders. This cultural shift also includes a push toward leadership that embraces experimentation and openness to change (Design Council, n.d.).

#### 4.1.4 Limitation of the framework

Despite its popularity, the Double Diamond process, and its recent application in Framework for Innovation, is not without its limits. As mentioned previously, the process appears linear and, therefore, not representative of the intertwined, complex, and often 'dirtier' reality of wicked problems ( (Rittel & Webber, 1973). Furthermore, the framework's preoccupation with delivery (as the final design phase) might result in the process being less relevant for designing large-scale transitions in which, as stated by Sangiorgi (2011), the outcomes tend to focus on creating conditions for social change. Furthermore, as our expert interviews revealed, service designers are rarely involved

in all design phases, which introduces an important set of challenges (e.g., the lack of control over user research). From that perspective, the framework seems to be a theoretical depiction of an ideal design process that does not always match the reality of service design projects.

In conclusion, it is important to address the limitation regarding the fundamental issues of assuming that deploying user-centred methods (within a user-centred process) is equal to designing in a gender-sensitive way. We will highlight two perspectives put forward by Waters (2021). First, as mentioned previously, the design field is gendered, meaning that more men than women work and hold higher positions in design jobs (especially in the branches of industrial and digital design) (Design Council, 2022), which means that design processes take place in a gendered environment (Wates, 2021). Second, by aiming at the 'user', instead of recruiting participants based on their gender or engaging with gender analysis, the research and sense-making become more sensitive to biases, as the unspecified user turns into a container for, often biassed, assumptions and personal projects of the design group (Waters, 2021). Weaver (2020) even proposes that the design thinking methodology, which builds on similar ideas as the Double Diamond, is inherently flawed as it assumes that designers, predominantly white and often men, can use empathy to understand the challenge and lived experiences of other social groups. According to the article's author, assumptions like these have led to discrimination in digital technologies, less safe products for women, or the lack of protection for vulnerable people (Weaver, 2020).

#### 4.1.5. Conclusion

This brief introduction to Framework for Innovation showed that besides its immense potential for facilitating collaborative design processes, designers must stay aware of its possible limitations and the environment in which the processes are practised.

# 5. DISCOVER

The Discover phase typically consists of a combination of primary and secondary research to explore and gather insights about the problem (Penin, 2018). We will begin with conducting secondary research to create foundational knowledge about circular consumption and gender by reviewing academic and non-academic sources. Among non-academic sources, we will include newspaper articles, social media posts, or Al-generated content. On the basis of our findings, we will turn to primary research carried out through a survey and interviews with residents in Denmark and Sweden.

We will conclude this chapter with a summary of our findings which will serve as talking points for engagement with experts in the Define phase.

This chapter consists of the following sections:

5.1 Introduction
5.2 Desk research
5.3 Online content analysis
5.4 Survey
5.5. Interviews
5.6 Conclusion of the Discover phase

# **5.1 Introduction**

The Discover phase of the design process requires designers to engage in divergent thinking. This involves allocating sufficient time to research and explore the identified problem and its context through a variety of research methods (e.g., Penin, 2018; Stickdorn et al., 2018). As mentioned in the previous chapter, the project context of this thesis focuses on the role of gender in a circular economy (CE henceforth), with a specific focus on possible gender differences and inequalities in circular consumption practices. Therefore, this chapter aims to gain an initial understanding of the different types of circular consumption practices, their environmental and social impact, and the key challenges to their uptake and implementation. Following that, we will explore how gender impacts the meanings, skills, and competencies required to engage with these consumption practices. By collecting and making sense of the insights gathered during secondary and primary research, we will be able to conclude this chapter by supporting the existing findings in the literature, namely that circular consumption is gendered and introduces risks of gender inequality.

Finally, it is important to note that although we will present the different research activities and their outcomes in a specific order, many took place simultaneously or were re-visited and applied again. For example, we have continuously consulted the literature when reflecting on our learnings from online content analysis or when discussing findings from the survey and interviews.

# 5.2 Desk research

The twelfth Sustainable Development Goal (SDG) highlights the urgency of transitioning toward a responsible and sustainable approach to production and consumption which could be achieved, for example, by applying circular economy strategies to ensure the continuous looping of resources and reducing the generation of waste (e.g., through practices of reduce, repair, refurbish) (UN, n.d.). This means that the existing production and consumption systems will need to eventually fully transition and be re-designed to fit the circular mindset (EU, 2020). Regarding circular consumption, the implementation would require establishing new and transformative consumption patterns, especially in the carbon-demanding countries of the Global North, given that sustainability cannot be achieved by relying solely on the availability of sustainable products and technologies (Welsch et al., 2017). In other words, to participate in circular consumption, we will need to dramatically change the ways we consume today.

To understand the dynamics of circular consumption and the ways it is shaped by gender, we decided to begin the Discover phase by conducting desk research<sup>5</sup> guided by the following research questions:

- What is considered a circular practice, and what are the barriers to consuming circular?
- What role does gender play in circular consumption, and what are the possible gender inequalities?

#### 5.2.1 What are circular consumption practices?

Circular consumption is often described as an antidote to accelerated and mindless consumption in the industrialised parts of the world (Carbajal, 2020), allowing consumers to "meet their needs through circular transactional processes: the acquisition, use, and post-use of circular products and services" (Gomes, 2022, p1). These new consumption practices are usually derived from the previously mentioned Rs frameworks (subsection 3.3.3.3) in which each 'R' stands for different strategies to keep product value and avoid waste generation (Potting et al., 2017; Reike et al., 2018). Although several Rs are directed primarily at resource consumption within production processes (e.g., Recover or Remanufacture), others are aimed directly at consumers and include strategies like refusing, reducing, reusing, repairing, and recycling (Reike et al., 2018) (see Table 6).

<sup>5</sup> Desk research is often considered part of a larger landscape analysis during which service designers explore a variety of secondary sources (e.g., reports, studies, trends, competitors, or experts) and data (e.g., previous documentation, open data, images, texts) (Penin, 2018)

Table 6. Overview of commonly mentioned circular consumption strategies and practices aimed at citizens (UNEP, n.d.; Reike et al., 2018)

More value	Circular strategies / Practices	Description	
retention and less waste generation	Refuse	The Refuse strategy refers to people's decision to reduce consumption of products and services by refusing them. This rejection can be directed toward entire products and services or their parts. <u>Examples:</u> avoiding single-use packaging, rejecting tester prod- ucts, eating at a restaurant over choosing take-away.	
	Reduce	The Reduce strategy is similar to Refuse as it assumes reduced consumption of products and services. <u>Examples:</u> Need-based rather than want-based use of products and services	
	Reuse	The Reuse strategy refers to extending the use of a product by sharing, reselling, donating, or gifting it. <u>Examples:</u> Second-hand selling and swapping	
	Repair	The repair strategy refers to extending a product's lifespan by fixing issues or changing faulty parts for new ones. The goal is to avoid unnecessary or premature waste. <u>Examples</u> : At-home repairs, repair cafes, professional repair services	
Less value reten- tion and more waste generation	Recycle	The Recycle strategy is primarily handled by recycling business- es and facilities, but people's involvement is also required as they should sort or compose their waste. <u>Examples:</u> At-home waste sorting	

Nonetheless, compared to other types of sustainable consumption (e.g., non-meat consumption, shopping locally, or refusing to fly), circular consumption is more closely linked to circular product processes and infrastructures. For instance, for people to be able to disassemble and replace product parts, the products must allow disassembly in the first place and provide appropriate guidance (Middlemiss, 2018). Furthermore, engaging in circular consumption also means that many activities previously handled by producers or different industries (e.g., disassembly, composting) are passed on to the consumers (e.g., repair or managing waste) and introduce more labour (i.e., consumption work) despite possibilities to outsource some consumption work to professional services (e.g., professional repairs) (Sutcliffe, 2022). While increased consumption work comes with risks and barriers, it also allows consumers to move from passive recipients to active co-producers and even become collaborators, stewards of natural resources, or activists (Middlemiss, 2018). This multifaceted identity of circular citizens is well explained by Korsunova, Horn and Vainio (2021), who explored various roles and identities young Finnish citizens take on when participating in circular consumption (Figure 18).



Figure 18. Schematic overview of the roles associated with circular citizens (Korsunova, Horn & Vainio, 2021, p767).

While the overview of practices (Table 6) might seem clear and straightforward, their implementation represents a radical challenge to rethink how industrialised societies approach resources and orchestrate multitudes of social practices (Clube & Tennant, 2023). Therefore, to enable and empower consumers to adopt new consumption habits, several policy frameworks (e.g., EU consumer law) focus on ensuring access to trustworthy information, repair and refurbishing services, or information and manuals to help consumers prolong the lifespan of their products (EU, 2021).

"For citizens, the circular economy will provide high-quality, functional and safe products, which are efficient and affordable, last longer and are designed for reuse, repair, and high-quality recycling. A whole new range of sustainable services, product-as-service models and digital solutions will bring about a better quality of life, innovative jobs and upgraded knowledge and skills." (EU, 2021, p2).

However, although many of the presented frameworks introduce circular practices as moments of great opportunities (see the quote above), the research on how implementing the full range of circular strategies will alter people's current lifestyles or contribute to their well-being remains underdeveloped (Korsunova, Horn & Vainio, 2021). As mentioned above, participation in the CE requires individuals and households to reconfigure the elements of their consumption work by adjusting their existing practices (e.g., refusing convenient products, recycling more) and adding new ones (e.g., sharing, repairing, composting). Furthermore, these practices must coexist in the complex household realities (e.g., single parents, shared households) and require, therefore, adequate supporting infrastructure (e.g., recycling stations and access to repair services), which may still not be fully in place (Hobson, 2021). At the same time, circular consumption introduces new ways of relating to products and services. For instance, business models based on rental- and access-based consumption, rather than ownership, require new ways of care and involvement (e.g., parking rental cars in designated spots) while leaving behind some of the existing practices (e.g., car-washing, securing car insurance) (Bardhi & Eckhardt, 2012).

#### What is 'consumption work'?

According to Hobson (2021, p3), the term consumption work is used to describe "the labour integral to the purchase, use, re-use and disposal of goods and services." For example, self-service (e.g., cashiers, coffee machines, private banking) or self-assembly (e.g., furniture) are good examples of work performed by consumers. However, to engage in consumption work, consumers must have access to important resources such as time, knowledge, skills, or tools (Hobson, 2021). Furthermore, it is also important to acknowledge the systemic dimensions of consumption labour, meaning that consumption does not exist as a separate phenomenon but is embedded in the larger socio-technical systems. In other words, consumption is influenced by various political, technological, and social factors (e.g., what labour is recognized and rewarded economically and socially) (Sutcliffe, 2022).

# REFLECTION

As designers, we find the notion of consumption work (i.e., consumption labour) both interesting and relevant to explore as the topics of work and labour become increasingly more debated in post-covid-pandemic societies. For example, we pondered how consumption labour relates to some contemporary discussions on the meaning of work (e.g., the post-pandemic 'quite-quitting') and various subsequent social movements (e.g., the recent 'I do not dream of labour') and realities (e.g., the current market recession). Furthermore, the research on consumption labour made us explore and consider other types of labour outside the wage economy (e.g., emotional labour or domestic labour) that we would not usually pay attention to. Moreover, we reflected on how these different labour types are unequally distributed throughout society (e.g., women tend to engage more in domestic and emotional labour).

So, what benefit does the labour lens provide to service designers? We propose that it extends the understanding of what designers design for. Besides focusing on experiences of services, designers can critically think about the impacts and work behind new practices their solutions introduce (e.g., extended domestic labour).

#### 5.2.2 Barriers to circular consumption

Given the profound changes in consumption patterns and new forms of consumption labour, research into acceptance, uptake, and engagement with circular consumption practices and business models showed several barriers (e.g., Sijtsema et al., 2020; Arekrans et al., 2022). In this short subsection, we will introduce several barriers and group these into the following categories: temporal, economical, ideological, psychological, practical, and finally, technological barriers.

First, several barriers tied to circular consumption are temporal, meaning that individuals and households might lack time to engage in circular consumption (Sijtsema et al., 2020). These temporal barriers might be rooted in the perceptions of required time (e.g., repair time), its intensity (e.g., number and frequency of needed repairs) or the value of invested time (e.g., wasting time on unsuccessful repair) (Fachbach et al., 2022; Rabiu & Jaeger-Erben, 2022). Similarly to time, affordability and cost are critical barriers to whether circular consumption practices get picked up and routinised (Rabiu & Jaeger-Erben, 2022). Here, the connection between financial resources and circular (or more broadly sustainable) consumption is troublesome, given that sustainable living is often linked to power, status, and financial means to purchase sustainable products and services (Middlemiss, 2018). Therefore, service designers should be aware of possible design risks of stigmatising whole social groups (e.g., low-income workers and single mothers) who might not have the resources to engage with circular solutions.

The category of ideological barriers refers to social norms and expectations that people form around circular consumption. For instance, visible signs of repair or use of repair services might be traditionally linked with lowstatus social groups and can lead to feelings of shame (Fachbach et al., 2022; Guillen-Royo, 2023). Similarly, products made from recycled materials could be considered less attractive, more fragile, or as being of lower quality compared to products created from virgin resources (Testa et al., 2022). Furthermore, existing social perceptions and preferences for private or household ownership affect circular practices based on access (e.g., renting or sharing). At the same time, owning specific items is also linked to the sentimental power and value of their ownership (Arekrans et al., 2022). This insight brings us to the next category of psychological barriers. Guillen-Royo (2023) reported that practices linked to collaborative consumption (e.g., renting, borrowing, or sharing) are connected to positive feelings (e.g., excitement) but also evoke negative emotions (e.g., anxiety and worry). Furthermore, engaging with items previously used, touched, or worn by others can generate feelings of disgust, drive worries about bacteria or contamination, and create a sense of the item's impurity (Testa et al., 2022).

Lastly, people can face several practical and technological barriers in finding, accepting, and engaging with circular consumption practices. For example, many circular consumption practices require people to acquire and apply certain skills, knowledge, or specific tools which are not always equally accessible or distributed across the whole population (Hobson, 2021). Furthermore, people living in cities usually have better access to circular consumption initiatives and infrastructures compared to those living in the countryside or suburbs (Vanhuyse et al., 2022). Finally, as we mentioned in subsection 3.3.4, digital technologies are crucial to the implementation of the CE and will likely shape the transition to circular consumption. Therefore, service designers should be aware of how technological challenges (e.g., data privacy and data literacy) will shape the design of circular consumption practices.

# REFLECTION

Exploring the different barriers to circular consumption shows that its implementation is challenging even without considering gender (or other social) differences. At the same time, the widespread presence of implementation barriers might prevent further engagement and research on ways they shrink or grow under the influence of different social factors (e.g., fewer barriers experienced by high-income groups compared to those with low-income status). Given that service designers might discover these barriers early in their design process, they should be trained to systematically analyse and understand them even though they might not be able to address or tackle all their variations within the scope of a given design project.

#### 5.2.3 Gender in circular consumption

Besides the barriers to circular consumption mentioned above, there are various social disparities between individuals that affect their willingness, participation, and involvement in circular consumption practices. These differences include factors such as age, gender, social and health status, or ethnicity (Middlemiss, 2018). Given the focus of this thesis on the role of gender, it is relevant to explore the current research on potential gender disparities in circular consumption. To comprehensively present our findings to the readers, we will structure this section into several themes.

#### 5.2.3.1 Differences in attitudes and perceived responsibility

According to several studies (e.g., Atlason et al., 2017; Xiao & McCright, 2017; Gazzola, Pavione & Grechi, 2020; Antunes et al., 2022; or Brough et al., 2023), compared to men, women as a group are more interested in sustainability topics and willing to change their consumption practices towards more sustainable ones. In addition, women are more likely to choose and purchase products and services with an eco-friendly image or opt for more sustainable ways of travel (Hwang & Choi, 2017). Furthermore, women generally express more concerns and an enhanced sense of responsibility to choose sustainable products or engage in circular practices (e.g., repair) (Rabiu & Jaeger-Erben, 2022). At the same time, women continue to be stereotypically labelled as being bigger consumers and more materialistic than men. As a result of that, men place the responsibility of sustainable consumption on women. However, this stereotype of a shopping-obsessed woman does not match the research, which shows that men have larger carbon footprints due to their preference for car transportation and frequent meat consumption (Bloodhart & Swim, 2020). For example, according to a study by Kanyama et al. (2021) that compared greenhouse gas (GHG) emissions emitted by single Swedish men and women, men were responsible for 18% more consumption-related GHG emissions than women.

#### 5.2.3.2 The feminine and masculinity traits

Although sustainable consumption (including circular practices) is considered necessary for liveable futures, engaging in sustainable behaviour leads to lower, rather than higher, social status. Besides some high-value activities (e.g., shopping for ecological food, driving an electric car, or having solar panels), many circular practices call for owning less, keeping older items, rethinking purchases, and reducing pleasurable activities (e.g., less shopping, less travelling). As a result, circular consumption and sustainable living are often perceived as feminine, as they promote values of care, nurturing, warmth, nature stewardship, or altruism, and are therefore different from the progressive values associated with masculinity (e.g., progress, hedonism, or access to technology) (Hawkins, 2012; Borau et al., 2020; Bloodhart & Swim, 2020). Given that people are more inclined to engage in behaviours consistent with their identities (e.g., women engaging in feminine activities), the influence of the feminine-green stereotype has been linked to men's avoidance and withdrawal from choosing sustainable products and services as these do not carry masculine connotations or might be associated with masculinity loss and homosexuality (Borau et al., 2020). According to Brough et al. (2023), this tendency is stronger among men who experience femininity as a threat to their gender identity.

#### 5.2.3.3 The gendered household

Given that households are typical spaces of consumption, they are also important targets of different circular consumption policies and recommendations (e.g., cooking, cleaning, doing laundry, or renovating) (Middlemiss, 2018; Wilde & Parry, 2022; Mechlenborg & Gram-Hanssen, 2022). As mentioned previously, the transition toward circular consumption (and sustainable lifestyles in general) also introduces new and sometimes more labour-intensive practices (e.g., repairing, refurbishing, composting) (Middlemiss, 2018). Now, the challenge is that household consumption and the division of domestic labour tied to it are gendered and do not equally involve men and women. For example, women in Denmark still spend approximately an hour more on household chores (which equals nine weeks of full-time unpaid labour per year) compared to men, despite men starting to take a more prominent role in the organisation of household work and childcare (Djøf, 2021; Mechlenborg & Gram-Hanssen, 2022). Besides the volume of labour, the practices typically performed by the genders also vary. While women are often responsible for ensuring a liveable and pleasant home through practices and routines of cooking, cleaning, shopping or doing laundry, men tend to dominate and be responsible for temporary tasks like repairs and home improvements (Hobson, 2021; Aggeli et al., 2022; Wilde & Parry, 2022). Moreover, women are also disproportionately exposed to the household-related mental load (e.g., planning, coordinating, anticipating needs)
and are often the primary providers of care to other family members (e.g., children, pets, elderly) (Aggeli et al., 2022).

As a result, gender plays a vital role in how new circular practices are introduced and implemented in households. However, given that more responsibilities for domestic labour and care are currently placed on women (e.g. managing a household's flow of resources, energies, and waste), embracing circular consumption practices without addressing those inequalities might lead to their worsening and labelling household environmental impact as a women's issues (Hawkins, 2012; Godin & Langlois, 2021; De Wilde & Parry, 2022).

#### 5.2.3.4 Impact on circular practices

Beginning with reduction, the circular practice with one of the largest value retention, the motivation to limit consumption (e.g., of clothes), is differently motivated between genders. While for women, the reasons behind reduction are primarily linked to their concerns about environmental sustainability, men are more likely to list practical and frugal reasons (e.g., having easy attire for going to work) (Martindale & Lee, 2019). The impact of gender is also apparent in practices or repairing and refurbishing. When it comes to repairs, it is possible to distinguish repairs performed at homes, via community offerings, and through professional services. Within households, men are typically engaged in repair tasks, while maintenance and care tasks (e.g., cleaning, mopping, or dusting) are carried out by women. These gender roles are also apparent in community repair, where men assist with their technical and mechanical skill sets while women are more focused on smaller repairs and textile mending. As women are typically lacking the capabilities and confidence to engage with mechanical repairs (e.g., of minor appliances), they are also more likely to pay for professional repair services (Rogers et al., 2021).

Several gender differences can also be found within sharing practices, especially those established under the sharing economy. For example, men seem to have a greater overview of digital sharing platforms and tools than women and would be more represented in the shared maker- and production spaces. Women have, on the other hand, greater social capital that they use in various swapping and community trading activities (e.g., food or clothes swapping) (Eichhorn, Hoffmann & Heger, 2022). Although we could not find much evidence about gender influence on community sharing and second-hand shopping, there is some possibility that these are gendered as well, given that, for example, there are more second-hand platforms and stores (primarily with clothes and accessories) aimed at women than men (Indvik, 2016). Finally, the all-time popular but least impactful method of recycling has collected a large body of research, news coverage, and various toolkits supporting recycling practices and behaviours. Despite that, men seem to be still less likely to engage in recycling their or household waste (Oztekin et al., 2017; Somerville, 2018).

#### 5.2.3.5 The challenge of involving men

When addressing the challenge of circular consumption through a gendered lens, it is essential to neither perpetuate old stereotypes nor create new ones. If recognizing gender differences and inequalities leads only to focusing circular projects and initiatives primarily on women, the transition to circularity (and sustainability at large) runs the risk of leaving out men (and other gender identities). Therefore, the challenge lies in promoting a circular mindset, overcoming barriers, and crafting new consumption practices with the participation of all gender groups (Odrowaz-Coates, 2021). Here, finding ways to involve men is important. However, in line with the insights described above, the question remains - how can we make men care more?

In an experimental study focused on understanding factors that might influence male attitudes to sustainable consumption, Borau et al. (2020) discovered that partners positively influence men's green consumption. In this case, the men's willingness to adopt sustainable practices (e.g., eating less meat) and change their behaviour signals their commitment to their pro-environmentally oriented partners. As a result, men who engage in pro-environmental behaviour are perceived by women as more feminine but also more desirable and suitable for a long-term commitment. Findings like these provide opportunities for marketers and campaigners to engage the male audience by crafting messages that link environmental concerns with romantic and partnership qualities (Borau et al., 2020). At the same, we wondered whether relying on the influence of men's partners can prove challenging as it stereotypically assumes that all women think and act pro-environmentally and are willing to carry additional labour of change-makers in their homes or workplaces. Therefore, given the impact of consumer products and services on identity (e.g., green-feminine stereotype attracting women), Brough et al. (2023) suggest shifting the branding of sustainable products and services toward more masculine narratives to avoid them being perceived as primarily targeting women.

However, just as women are stereotypically associated with care practices (e.g., repairing, reusing leftovers, composting), men are typically associated with technologically oriented sustainability, such as the use of energyefficient (e.g., lightbulbs) and self-sufficient initiatives (Nordic Council of Ministers, 2022). For example, Mechlenborg and Gram-Hanssen (2022) propose that, in households, men typically introduce green technologies like domestic photovoltaic systems as a way for continuous technological home improvement. Although women recognize the technological benefits of such technologies, their uptake and implementation within the household often adds to an already existing increased mental load (e.g., coordination of energy production with daily activities) and might further increase labour inequality (Mechlenborg & Gram-Hanssen, 2022). However, the growing complexity of these green technologies and their more user-friendly interface also allows for changing this stereotype. As a result, their use relies less and less on mechanical skills or experience with DIY projects and allows more women to operate them (Nordic Council of Ministers, 2022).

## REFLECTION

The challenge for service designers in navigating gender stereotypes and consequences of traditional gender roles lies in striking a balance for which they recognize these without further perpetuating harmful biases and inequalities. For example, considering that women display more acceptance and open attitudes toward circular consumption does not mean that women are naturally more prone to think and act more sustainably than men but rather that they were socialised to value caring and nurturing activities tied to motherhood and resource stewardship (Bloodhart & Swim, 2020).

#### 5.2.4 Summary and next steps

The insights from the desk research gave a theoretical foundation for understanding the different circular practices and their key challenges. For instance, we learned that, although heavily promoted by policy-makers, circular consumption represents a challenge as it requires substantial reconfiguration of the current ways of living and doing. Moreover, the topic of consumption labour caught our attention as it is something we believe is rarely considered or explored in design projects. However, once we start seeing consumers (and more broadly citizens) as groups contributing with labour and time, their role begins shifting from being passive receivers (i.e., the transition is happening to them) to co-producers of circular societies (i.e., the transition is happening with them). Furthermore, looking for literature exploring the gendered experiences of circular consumers, we realised that this research still remains relatively underdeveloped. However, the existing articles and studies demonstrate the existence of consumption differences between women and men and show how these also penetrate the domain of sustainable and circular consumption.

In the next steps of our process, we will continue our desk research but turn our attention to the non-scholarly discourses of circular practices and their gender dimension. To do so, we will first (subsection 5.3.) explore the ways circular consumption is depicted in media and put forward by AI language processing models. After that, we will explore findings from primary research (subsections 5.4. and 5.5).

#### 5.3 Online content analysis

To understand discourses about circular consumption and obtain more data before our primary research, we chose to extend our desk by conducting a short online content analysis of selected blogs, newspaper articles and social media posts regarding circular consumption (subsection 5.3.1) (see Appendix 6 for the complete overview).

Furthermore, we explored how the stories of circular consumption are described through AI language processing models (subsection 5.3.2)

It is important to note that this content analysis is neither extensive nor covers all circular consumption practices. The goal of this research activity is to investigate selected online artefacts to explore the extent to which gender is publicly discussed in relation to a circular economy (CE hereafter) and the ways gender roles manifest themselves through online images and text. We selected the online sources for the analysis from search results on Google generated in a private search mode (see Table 7 for examples of search words). In other words, to avoid the search links being filtered by our preferences stored by Google, we used the incognito mode on two different devices to mitigate the risk of biassed results.

Search themes	Examples of search words		
Sustainability	'Living sustainably', 'sustainable products' 'sustainable future living', or 'sustain- ability and everyday life'		
Circular consumption	'Consuming without waste', 'zero-waste lifestyle', 'circularity in everyday life', or 'how to live circular'		
Gender in circular consumption	'Gender is sustainable living', 'Are men sustainable?', or ´Are women sustain- able?'		
The search words were also enhanced with extra words like 'news article', 'blog', or 'discussion' to find more non-scholarly literature.			

#### Table 7. Overview of search words used for online content analysis

#### 5.3.1 Findings from non-scholarly articles

Most of the reviewed articles came from prominent media outlets such as Guardian, The Conversation, Euro News, and BBC. Furthermore, we looked for articles on Danish sites, such as DR. We also consulted several international blogs writing about sustainable and zero-waste lifestyles. Our findings showed that the volume of websites, online magazines, and blogs engaging with these topics is vast. Besides simple tips to make everyday life more sustainable, some websites provide evidence-based consumer advice to help people navigate the murky waters of greenwashing (e.g., websites like GoodonYou or EthicalConsumer). However, as our focus is on gender, we applied this perspective to guide our analysis of the collected materials in which we looked for either explicit or implicit (e.g., through imagery) notions of how sustainability and circularity are discussed and presented.

#### 5.3.1.1 Sustainable and circular living tips

The reviewed articles provided many tips (up to 100 per an article) on adjusting lifestyle toward more sustainable consumption. Several blogs and magazines (e.g., The Minimalist Vegan or The Eco-hub) listed a combination of private (e.g., households adjustments) and public (e.g., writing to politicians) actions people could take and therefore highlighting that climate actions are not resting solely on individuals but require a collective change. As our focus is primarily on changes in household practices and labour, we excluded public and political engagement tips from our analysis.

Narrowing down on households, we could see that the operationalisation of circular (and broader sustainable) consumption included tips ranging from simple swaps requiring minor changes (e.g., replacing a plastic toothbrush with a wooden one) to more complicated alterations (e.g., making home-made cosmetics) demanding knowledge, skills, and large volumes of consumption work. To illustrate these differences, we created a simple matrix divided into four quadrants (Figure 19). We then populated these with selected strategies based on their consumption work demands and the extent to which they build on the existing at-home practices or introduce new ones. Importantly, this division is approximate, as we did not use any standardised methods or metrics to assess the selected tips. Instead, we based the placement into the quadrants on our estimates for new knowledge, skills, materials (e.g., the need for a sewing machine), and the time needed to act on a given sustainable lifestyle tip.



Figure 19. Sustainable consumption matrix. Figure produced by the thesis team.

The review of blogs and articles showed that implementing many circular consumption tips will likely result in higher consumption work placed on households and individuals. For some, it will also require learning new skills (e.g., repairing, sewing) or spending more resources on professional help. However, the reviewed articles would frequently introduce the tips as easy to implement, and something people can begin doing already today. While raising people's self-efficacy and confidence to engage in sustainable consumption is important, it is also partially misleading and could possibly lead to more incremental (though manageable) rather than radical changes. However, we also found several pragmatic articles that provided a more nuanced view of what reducing consumption brings into people's lives. For example, in an article about voluntary simplicity in housing, MacArthur and Stratford (2020) showed that living in eco-friendly houses with vegetable gardens often requires sacrifices, such as moving out of city centres, spending hours on researching more climate-friendly options, or having to do some of the construction work.

Next, we wanted to explore whether the feminisation of circular (and more broadly sustainable) consumption is also apparent in non-scholarly sources. Besides the above mentioned increase in household consumption work, which is often carried out by women, we looked for notions of typically-female consumption and looked at images used to illustrate the articles.

Applying this perspective, we could see that many tips (both internationally and in Denmark) centred around shopping, cleaning, and cooking practices. In other words, domains that are often associated with women. On the other hand, searching through the tips, we could not find any notions regarding sustainable consumption of technologies besides a tip for sorting e-waste and one article mentioning the benefits of repair services. For example, when computers were mentioned, it was in line with providing advice on making digital notes or turning the device off if not in use. Similarly, while replacing cars with public transportation or bikes was mentioned, there were no other tips for making car ownership more sustainable for those who cannot give up driving. However, as we will see in the later interviews, technologies and conspicuous consumption (e.g., cars) dominated men's reflections on their own consumption habits. To explore this gap, we looked up articles and tips for men and discovered that several focused mainly on fashion, and some mentioned switching to public transportation and energy efficiency. We did not find any specific advice for men about sustainable cleaning or use of cosmetics.

Finally, we examined the images used in the articles and blog posts. As some were published on websites including content primarily aimed at women (e.g., fashion, interior design, make-up), we extended our search to include newspaper headlines (e.g., DR or Berlingske) or snapshots from consumer advisories (e.g., Tænk). The results showed that women and young people were overrepresented in the reviewed materials (Figure 20).



Figure 20. A compilation of images collected during desk research into non-scholarly sources on sustainable consumption (Source: Images sources from www.google.com, collage made by the thesis team).

#### 5.3.1.2. The gender gap

Within the reviewed sample, several articles and social media posts (e.g., video essays on YouTube) directly addressed the gender differences in sustainable consumption. For instance, Somerville (2018) discussed the lacking engagement of men and the tendency to present men's participation in sustainable consumption in a humorous way, such as through the slogans like 'wife made me do it' on reusable shopping and recycling tote bags. In fact, we found several articles explicitly devoted to the issues of reusable bags and their 'unmanly' perception (e.g., O'Neill, 2019) as well as several businesses selling the more 'manly' versions of multiple-use shopping bags (e.g., with images of beer, screwdrivers, and motorcycles). In her article for Guardian, Hunt (2020) calls this discrepancy an eco-gender gap and argues that while women are swamped with more sustainable versions of their products (e.g., reusable menstrual utilities, recycled razors, or multiple-use coffee cups), men are not affected in the same way. Although she concludes her article by instilling hope for change in Generation Z that is more aligned (also across genders) on the need for climate action than the society was in the 1990s and earlier 2000s (Hunt, 2020). However, Capecchi (2018) points out an issue with the possible say-do paradox, stating that while many younger people are concerned about pollution, waste levels remain problematic and relatively unchanged.

The put-forward solutions to close the gender gap resembles those proposed by the academic literature, namely an increased focus on making sustainable consumption more masculine or, even better, gender-neutral. For example, Elliot (2021) interviewed two men behind a brand producing ethical shoe ware who mentioned their success with using the 'heroic protector' metaphor to reach the male audience but who also expressed annoyance with the impact gender has on sustainability which, as they claim, should have nothing to do with gender and all to do with being just a human. Finally, a content creator Immy Lucas, who runs a YouTube channel called Sustainably Vegan, dedicated a whole video to exploring the gender differences in sustainability, concluding that gender is generally seen as either positive (i.e., women can be at the forefront of sustainability) or negative (i.e., sustainability becomes another task on their already lengthy to-do lists). However, without a greater political representation of women, both routes can lead to suboptimal solutions.



Figure 21. Examples of Google search for sustainable products and a thumbnail of a video essay discussing the eco-gender gap (Source: www.google.com and www.youtube.com)

#### 5.3.2. Exploring AI

In the second part of this review, we decided to experiment and explore narratives generated by AI. At the beginning of our thesis writing process, the nowadays immensely popular language processing models became available to the public. As artificial intelligence systems have been several times accused of being discriminatory and racist (e.g., Alba, 2022; EU, 2022), we were interested to see how the systems reinforce or tackle the possible gender differences and stereotypes when asked to generate stories about circularity.

We tested two AI text processing models, namely ChatGPT and NotionAI. However, we had only access to their free versions, which has likely affected the quality of the output. To compare the results, we tested both models simultaneously, using the same four types of prompts - a clothing repair scenario, a computer repair scenario, a future circular society, and a future circular households (Table 8)

Theme	Prompt for text generation	
Clothing repair	Write a short story about a person who is repairing their jacket because they want to consume more sustain- ably. Describe who the person is, and how they look.	
Computer repair Write a short story about a person who is fixing their computer because they want to keep it for Write who this person is and how they look.		
Future circular society	Write a short story about a circular society where people take care of products and keep them for longer by sharing them, repairing them, and reusing materials. Describe who does what in this society.	
Future circular household	In the near future, we have to start living more circularly and sustainably. Describe a household for me. De- scribe who are the members and what they do to consume more sustainably. Who gets the most work done?	

#### Table 8. An overview of prompts used for AI text generation

#### 5.3.2.1 ChatGPT

The prompts for ChatGPT to generate clothing and computer scenarios returned two short stories where an environmentally-conscious woman (Emily) engages in sewing her jacket while a tech-enthusiast man (Mark) spends hours fixing his computer.

"Emily, a conscious environmentalist, noticed a tear in her favourite jacket. Rather than discarding it, she decided to repair it herself. With her long brown hair and peaceful aura, she looked determined. Sewing the tear, she felt a sense of accomplishment, knowing she was reducing waste and her carbon footprint. After finishing the repair, she proudly wore her jacket, vowing to repair rather than replace. Emily believed that small actions like hers could make a big difference in promoting sustainability." (AI response)

"Mark, a tech enthusiast, wanted to keep his computer for as long as possible. When it started slowing down, he decided to fix it himself. With his thick-rimmed glasses, unkempt hair, and serious look, he spent hours troubleshooting the problem and found a software fix. Mark was proud of his accomplishment and believed that fixing possessions instead of replacing them was a way to promote sustainability." (Al response) When creating stories about future circular societies, the text output still contained a gendered division of work between women working in clothes-mending workshops and men involved in fixing broken devices. Yet, at the same time, the story pointed out that this future society had abolished gender limitations and the activities people choose to perform stem from their individual wishes and commitment to the shared goal of waste reduction and resource preservation.

Similarly, the story about the future household begins with the familiar gender distinction. Sarah, the mother in the family, is in charge of shopping and ensuring composting. James, who works as a software developer, is responsible for securing fossil-free energy with the help of his son James, who takes care of water conservation. Both of these activities count as high-value consumption tasks. Finally, the youngest, Lily, helps her mother collect food waste. The story ends on a positive note, suggesting that despite their different responsibilities, all family members contribute equally and recognise the value of sustainable consumption.

"In the circular society, tasks were not assigned based on gender. Instead, individuals were free to choose the activities that best suited their skills and interests. For example, John, a retired mechanic, repaired bicycles and small appliances at the Repair Cafe, while Sarah, a retired seamstress, repaired clothing and textiles. Tom, a carpenter, helped maintain the Tool Library, while Karen, a fashion designer, organised the Clothing Swap and created new outfits from donated clothing. Lisa, a horticulturist, organised the Community Garden and taught others how to grow their own food. In this society, both men and women had the opportunity to contribute their skills and knowledge to create a more sustainable future. There were no gender-based limitations on what tasks individuals could perform or what roles they could take on. The focus was on cooperation and a shared commitment to reducing waste and saving resources. In summary, the tasks done by individuals in the circular society were based on their skills and interests, and not on their gender. The community embraced diversity and collaboration, and everyone had the opportunity to contribute to creating a more sustainable future."

(Al response)

"In the near future, households will need to adopt circular and sustainable practices to reduce their environmental impact. Let's imagine a household where everyone is committed to sustainable living.

The household consists of four members: John, a software developer; Sarah, a teacher; their teenage son, James; and their young daughter, Lily. Each member of the household has taken on specific responsibilities to consume more sustainably. John is responsible for energy management. He has installed energy-efficient appliances and LED lighting throughout the house. He has also installed solar panels on the roof to generate renewable energy and reduce their dependence on the grid. Sarah is in charge of waste reduction. She has set up a compost bin in the backyard, where they compost all their food scraps and yard waste. She also makes sure to recycle as much as possible and avoids buying single-use products.

James is responsible for water conservation. He has installed low-flow showerheads and faucets to reduce water usage. He also makes sure to turn off the tap when brushing his teeth and takes shorter showers. Lily is responsible for food waste reduction. She helps her mom with the compost bin and makes sure to eat all her food, so nothing goes to waste.

While each member of the household has taken on specific responsibilities, they all work together to achieve their sustainability goals. They make sure to shop locally and support businesses that use sustainable practices. They also carpool and bike whenever possible, reducing their carbon footprint. In terms of who gets the most work done, it's hard to say. Each member of the household is equally committed to sustainable living, and they all work together to achieve their goals. They understand that sustainability is a team effort, and everyone has a part to play."

(Al response)

#### 5.3.2.2 NotionAl

Using the second language processing model, we realised that the model probably draws on similar data sources as ChatGPT, as some of the generated stories were rather similar. For example, like ChatGPT, the first story featured a woman, Maya, fixing her jacket. However, the second story seemed gender-neutral as the character Alex is referred to as 'they'.

"There was a young woman named Maya who loved fashion and always kept up with the latest trends. However, she recently became aware of the negative impact that fast fashion has on the environment. She decided to take action and become more sustainable in her consumption habits. One day, Maya noticed that her favourite denim jacket had a tear in the sleeve. Instead of getting rid of it and buying a new one, she decided to repair it herself. Maya went to a local craft store and purchased some thread and a needle. After a few hours of work, Maya was able to mend the tear in her jacket. She was proud of herself for taking the time to fix it instead of contributing to more waste."

(Al response)

"Once upon a time, there was a young professional named Alex who was determined to extend the life of their computer. Alex had always been passionate about technology and loved tinkering with computers. One day, Alex noticed that their computer was running slower than usual. They knew that if they didn't take action soon, they would have to buy a new one. Alex was determined to fix the issue and keep their computer for as long as possible." (Al response)

In describing future circular society and household, the NotionAI uses similar names and information (e.g., the family father is an engineer, the mother is teacher) but claims that circular consumption in both the society and household is not structured around or affected by gender differences. Instead, it introduces new social groups such as 'sharers', 'repairers', 'creators', and 'educators', suggesting a new system of social roles and responsibilities. However, although many household activities are done together (e.g., growing vegetables or purchasing local foods), John, the father, remains in charge of energy supply while Mary, the mother, is the head of composting. Again, the AI seems to assign the high-value sustainability tasks (e.g., managing solar energy) to men while women deal with low-value responsibilities (e.g., waste collection).

"Once upon a time, in a circular society, people lived in harmony with the environment by taking care of their products. Instead of throwing things away, they shared them with others, repaired them when they broke, and reused materials to create new things. The society was divided into different roles. The "sharers" were responsible for lending their belongings to others in need. The "repairers" fixed broken items to keep them functioning for longer. The "creators" upcycled materials to create new products. Finally, the "educators" taught others how to take care of their possessions and live sustainably. Together, these groups worked in unison to ensure that nothing went to waste and that the environment was protected for future generations. The circular society was a beautiful place, where each individual played a vital role in creating a sustainable future."

(Al response)

"In this household, there are four members: John, Mary, their son Jake, and their daughter Emma. John works as an engineer, Mary works as a teacher, Jake is in high school, and Emma is in middle school. To consume more sustainably, they have implemented several changes in their daily routine. They use reusable bags and containers when shopping, and compost their food waste to reduce their overall waste. They also use energy-efficient appliances, and have installed solar panels on their roof to generate their own energy. They grow their own vegetables in a small garden in their backyard, and purchase locally-sourced produce whenever possible to reduce their carbon footprint. Mary takes charge of organising the composting and gardening efforts, while John manages the energy usage and appliance maintenance. Jake and Emma help out with the gardening and composting, and also participate in community events to promote sustainable living practices. Overall, everyone in the household contributes to their sustainability efforts, but Mary is the one who gets the most work done." (AI response)

### REFLECTION

Although we began exploring the Al language processing models as a fun experiment and had many hours of laughter over some of the stories or images generated by services like MidJourney, we also recognized the power of such innocent requests for short stories. During our writing process, using Al technology became almost a daily task for many people. We heard stories of people writing newsletters, cover letters, or turning simple bullet point lists with ideas into well-articulated paragraphs. However, we also heard stories of children using ChatGPT to write a fairytale or people dropping Google and using ChatGPT as the go-to source of information. While the processing power, speed, and depth of information the models provide are mind blowing and revolutionary, the stories like those above show that Al is learning from our digital artefacts that are largely gendered. Therefore, service designers using Al to generate catchy scenarios, inputs for workshops, or probing materials for their research should always pay attention to possible risks of stereotyping.

#### 5.4 Survey

To understand how people reason about, engage with, and imagine circular consumption, we decided to conduct primary research, starting with a survey followed by a series of qualitative semi-structured interviews. By combining quantitative and qualitative data collection methods, we aimed to broaden and deepen our understanding of people's experiences (as recommended by Björnen, 2015) while creating more reliable data sets. According to Bjørnen (2015), the basic structure of mixed methods varies and depends on how the quantitative and qualitative methods are deployed and analysed. In this thesis, we decided to follow the explanatory sequential mixed method approach in which the quantitative data collection and analysis occur before the qualitative research (Björnen, 2015). By engaging with the quantitative methods first, we hoped to obtain an initial understanding of possible gender differences within circular consumption practices, which we could use to structure the following interviews with recruited citizens.

Therefore, the purpose of the survey was to provide initial insights for our research questions and focused mainly on mapping of:

- Attitudes towards selected statements regarding circular consumption practices (e.g., a likelihood of advising others on how to consume more sustainably)
- The current frequency of engaging in circular consumption practices (e.g., recycling waste or buying secondhand)
- Main challenges in adopting circular consumption practices (e.g., the need for more skills or knowledge).

Based on the literature review findings, we assumed that the survey would indicate greater interest and a higher frequency of engaging in circular consumption practices among respondents who identified as women. On the other hand, respondents who identified as men would show more hesitation and less engagement in circular consumption. To understand how these differences would form people's ideas about sustainable futures, we included an additional question asking the respondents to complete a sentence describing qualities of a future driven by circular consumption (e.g., repairing, sharing).

## REFLECTION

The expected connection between gender and self-reported engagement in circular consumption was explored in the survey analysis. This allowed us to create one survey template instead of making one for each gender and to later filter the collected data using gender as a stratifying variable.

Notably, the invitation to participate in the survey did not specify the focus on gender but stated a general research interest in understanding how people engage in specific circular practices. However, in retrospect, we frequently discussed whether we should have disclosed the research focus on possible gender differences in the invitation text for the survey to provide respondents with more transparency about the project.

#### 5.4.1 Survey structure and language versions

The survey was set up in SurveyXact software and included informed consent with an explanation of the purpose and handling of the collected data to ensure data transparency. To minimise the risk of drop-out, we considered the shortcomings of the previous questionnaire and further reduced the number of questions to nine, primarily multiplechoice and rating inquiries. Again, we reserved open-ended questions for specifying selected choices and for the quick future-oriented imaginary exercise at the end of the survey (Appendix 7).

The survey was distributed through private networks and various social media groups. Here, the selected groups needed to be general enough and centred around topics unrelated to sustainability or circularity (e.g., Foreigners in Denmark). In terms of sampling strategy, we opted for convenience (e.g., through private networks) and snowballing sampling (e.g., by asking others to share the survey). As a result, the survey faced some limitations as both sampling strategies are typically biassed and might result in overrepresenting certain groups (Stickdorn et al., 2018).

Moreover, we distributed the survey within our private networks in Denmark and Southern Sweden to increase the number of survey respondents. Therefore, we developed the survey in three languages, namely Danish, Swedish, and English. Although we began by promoting all survey versions equally, we quickly realised that the nature of our networks (i.e., consisting mainly of internationals) heavily influenced survey response rates, meaning that the English version received the most replies (n=102). We reacted by trying to boost the visibility of the remaining two surveys, asking our Swedish- and Danish-speaking friends and family members to share the questionnaires with their networks. However, the response rate remained low, especially in the Danish version (n=13).

Furthermore, we discovered that several respondents who took the English version of the survey were also Danish speakers who simply felt confident answering in English. As a result, following a discussion with our supervisor and ensuring no significant disagreements in the data sets, we collapsed the English and Danish survey findings. Therefore, in the following survey analysis, we will focus primarily on the findings from the combined Danish-English (n=115) sample and contrast these with the Swedish survey findings (n=46) for any between-country differences.

#### 5.4.2 Survey results

Despite concerns about dropout, the surveys had a high completion rate (80%), corresponding to 115 respondents in the combined Danish-English survey and 46 respondents in the Swedish version.

Considering first the demographics of the Danish-English version, women (75%, n=86) accounted for the majority of respondents compared to men (23%, n=27). Only two persons (2%) identified themselves as gender variant or gender non-conforming. Regarding age, participants between the ages of 20-29 (57%, n=66) and 30-39 (30%, n=35) represented the largest group, followed by responders between the ages of 40-49 (9%, n=10). Furthermore, nearly all respondents (88%, n=101) reported having completed a Bachelor's or Master's degree, suggesting the convenience bias in the survey distribution (i.e., overrepresentation of university-educated individuals). Lastly, we were interested in understanding the household type respondents currently live in as the research shows that a smaller household size might lead to larger consumption volumes (Jack & Ivanova, 2021). The results showed that the majority reported living with a partner (37%, n=42), followed by single households (19%, n=22) and families with children (17%, n=19).

Among the Swedish respondents, the proportion of women was also higher (68%, n=32) than men (32%, n=15), and no participant identified as gender variant or non-binary. Regarding age, most responders were between the ages of 30-39 (62%, n=29), followed by smaller groups of people between the ages of 20-29 (9%, n=4), 40-49 (9%, n=4), and 60-69 (9%, n=4). Concerning education, the Swedish data set showed a higher diversity, with the largest group (43%, n=20) reporting having a Bachelor's degree, followed by respondents with a high-school diploma (30%, n=14) and vocational training (11%, n=5). Lastly, over half of the responders (53%, n=25) reported living with a partner, and 36% (n=17) also shared their household with a child.



Figure 22. Combining our research wall with digital Miro analysis in SurveyXact and Miro

#### 5.4.2.1 Applying the gender lens

Within the analysis, we applied the built-in filtering option of SurveyXact software to generate new datasets based on the gender that the respondents identified with. The aim was to look for similarities and differences (if any) between the datasets. However, to determine and discuss any significant discrepancies, we had to also acknowledge the overrepresentation of women in the combined Danish-English (75%, n=86) and Swedish (68%, n=32) survey versions. Therefore, in order to isolate and understand the effect of gender, we examined first the patterns reported by women and men separately and used the discussion subsection for their careful comparison.

## REFLECTION

Reflecting back on the literature review, we realised that the overrepresentation of women in surveys and interviews is somewhat typical for many of the reviewed studies. Later on in the process, one of the interviewed experts suggested that from her experience, women tend to be overrepresented in the earlier stage of the design process as they are more comfortable sharing and discussing their life situations. Later in the design process, especially during user and prototype testing, this difference evens out and even tips toward the overrepresentation of men. Although we had limited time to support or challenge these field reflections with findings from academic research, we discovered other practitioners who pointed out the outspokenness of women as an issue in user research and suggested avoiding recruitment based on gender (Teixeira, 2018).

#### 5.4.2.2 Circular practices reported by women

Among women, those in the Danish-English data set reported higher awareness of the circular economy (CE henceforth) concept, with 63% (n=54) stating they had heard much about it, compared to Swedish-speaking women, where the majority (56%, n=18) reported limited awareness of the CE. However, both groups showed a similar pattern when reflecting on several claims regarding circular and sustainable consumption practices. For instance, the majority (over 70% in both groups) reported concerns about the impacts of their consumption and the importance of purchasing and accessing sustainable products. Therefore, we expected to see higher levels of self-report influence women have on the consumption habits of their friends and family members. However, the responses provided a more nuanced image which, on the one hand, might suggest a higher involvement of men but might have also been caused by the shortcomings in the question formulation. Given that many women (e.g., 41% of Danish-English speakers) chose the neutral option, it could suggest that friends and family members are two different social groups with their specific dynamics and hierarchies and, therefore, should have been separated to accommodate their possible contextual differences.

Regarding their circular consumption practices, essentially all women in both groups agreed with keeping things in use for a long time. However, as the later interviews showed, some products are kept for a short time (e.g., toothbrushes or stocking) even if they do not wear off or fall apart. Therefore, this answer must be viewed through the lens of intentionality (i.e., respondents intending to keep things as long as possible), which might only sometimes align with reality. Next to the prolonged use, over half of the women in both groups also reported frequent repairs (or attempts to repair) of items prior to buying new ones, and most claimed to recycle waste frequently.

The final multiple-choice question explored the main challenges to circular consumption practices. Compared to the Swedish-speaking group, Danish-English-speaking women reported cost as the main challenge (69%, n=59), followed by inadequate knowledge of what is sustainable (48%, n=41) and the lack of time (44%, n=38) and skills (44%, n=38%) needed for circular consumption. For Swedish women, the key challenges were the lack of knowledge (56%, n=18), accompanied by cost (44%, n=14), and the lack of time (38%, n=12). The survey also offered the respondents to enter additional barriers. For example, several women listed issues such as finding specific products when second-hand shopping, inconvenience, lack of warranty, or missing infrastructure.

"You have less flexibility and safety when buying second-hand - no warranty, possibility of returns if the item does not fit."

(A Danish-English survey respondent about barriers to circular consumption)

"Sometimes it is easier to shop new, especially if you do not have much time." (A Swedish survey respondent about barriers to circular consumption)

"It is not easy to buy sustainable organic household and hygiene products. Of course, online, it is possible [..] In CPH, it is hard to find a shop for this. I have lived in Portugal and Sweden before, and it is way much easier there. Here it requires much planning." (A Danish-English survey respondent about barriers to circular consumption)

#### 5.4.2.3 Circular practices reported by men

In both language groups, over half of the men reported hearing much about the CE concept, with only 4% (n=1) of Danish-English-speaking men and 20% (n=3) of Swedish-speaking men stating that they had yet to hear about the idea.

Among Danish-English-speaking men, 48% (n=13) expressed concerns about the impacts of their consumption, and 59% (n=16) stated that having access to sustainable products was personally important to them. A similar pattern could be found among Swedish speakers, with a slightly higher proportion of consumption-aware men (67%, n=10). However, despite the self-reported concerns and the importance of a sustainable lifestyle, most men in both groups had a neutral opinion on or did not report searching for sustainability labels on products. Furthermore, and as initially expected, men in both groups tend to be neutral or disagree with the statement suggesting their involvement in raising sustainable consumption topics among their family members and friends. Compared to the Danish-English group, the Swedish-speaking men seemed more opposed to it, with 40% (n=6) strongly disagreeing

and 20% (n=3) somewhat disagreeing.

Considering circular consumption practices, nearly all men in both groups reported frequently keeping things longer and often repairing them (or attempting to do so) before purchasing new ones. Furthermore, buying less and recycling were also practices with which over half of the responders in both groups would always or frequently engage. On the other side, none of the Danish-English-speaking men reported leasing products, and only 11% (n=3) frequently shared items with others. Among Swedish-speaking men, the pattern was similar, with only 20% (n=3) of the respondents frequently sharing or leasing products. In both groups, men also reported a low frequency of second shopping and a somewhat ambivalent approach to reusing products and materials.

Interestingly, the perceived main barriers to circular consumption varied between the two language groups. While the Danish-English speakers listed decreasing quality of items (70%, n=19), lack of time (59%, n=16), and lower comfort and freedom (48%, n=13) among the three main challenges, the Swedish speakers saw the cost (60%, n=9), the uncertainty of what counts as sustainable (47%, n=7), and lack of time and knowledge (both 40%, n=6) to be the most challenging. Lastly, several men mentioned additional barriers, noting issues like low-income struggles, inconvenience, and the constant risk of greenwashing.

"Some sustainable products are actually more expensive than new ones. As a lowerincome person, I am thinking [..] about putting food on the table and having some nice clothes for a job interview rather than looking for sustainable products. But I try whenever I can to do my best."

(A Danish-English survey respondent about barriers to circular consumption)

"It is inconvenient. It is easier to get something from the internet" (A Danish-English survey respondent about barriers to circular consumption)

"The planned obsolescence is often making it prohibitively expensive and complicated to fix stuff [..] The current late-stage capitalism makes it difficult to trust sustainability initiatives due to the ever-growing tendency of greenwashing." (A Danish-English survey respondent about barriers to circular consumption).

#### 5.4.2.4 Perceptions of circular futures

To help us imagine how people reason about a possible circular future (i.e., a future with implemented circular consumption), we decided to include a short exercise at the end of the survey and ask respondents to finish the following sentence: "**The future in which we share things, repair them and keep them for longer sounds...**". During analysis, we sorted all responses again according to gender and translated Danish and Swedish responses to English. Then, having the entire data set in English, we began looking for patterns that could help us cluster over 130 statements. In total, we arrived at nine categories of statements:

A future that considers overall sustainability and the positive impact of circular consumption (e.g., in terms of larger well-being). Responses in this category centred typically around the likelihood that engaging in circular consumption practices will results in a more sustainable future, for example:

"[..] sounds like a sustainable future." [Man]

"[..] sounds like a long-lasting future." [Man]

"[..] sounds like what we need to do for a more sustainable environment." [Woman]

A future that considers the positive impact of circular consumption, focusing mainly on nature and the **planet**. Compared to the previous category, this group of responses also highlighted the potential to contribute to sustainability. However, it also emphasised the link between circular consumption and care for nature and the planet. For example:

"[..] sounds like a like a lovely way of living, respecting the planet and going back to our roots" [Woman] "[..] sounds like the only way to live in peace with the Planet" [Woman] "[..] sounds like it should be good for the environment" [Man]

A future that shows the economic impact of circular consumption. Reflections in this category highlighted the possible positive impact of circular consumption, especially in relation to private economy and self-sufficiency, such as:

"[..] sounds like it should be good for the private economy." [Man] "[..] sounds more economic." [Woman] "[..] a good idea, if i can repair them by myself. That will be good for my economy, at least for a while." [Woman]

A future described through emotionally charged words and personal associations. Many completed the sentence by submitting emotionally charged words and phrases expressing mainly positive attitudes toward possible circular futures. For example:

"[..] sounds like a fantastic idea!" [Woman] "[..] sounds like a future I would love to live in." [Woman] "[..] sounds good." [Man]

A future that contains visions of societal changes. Some participants used the open question to reason and reflect possible societal and systemic changes that might need to happen for the circular future to be possible, for example:

"[..] sounds like an ideal future. This should come with strong incentives for consumers and strict rules for industry to enable more options for repair and reuse." [Man]

"[..] sounds like we are re-learning how our grandparents were living. Generations have lived more sustainably and I am hopeful that generations being brought up with that strengthened focus will do so again." [Woman]

"[..] sounds like it will be possible soon if there are joint forces between local administration, NGOs and citizens and a set of laws that regulate the mass production of circular products." [Woman]

"[..] sounds lighter, simpler, but also less convenient. It would require changing many things in the way we live and work." [Man]

A future in which a change is probable and needed. Several respondents opted for expressing the need or probability of such a circular future and the type of societal change it would require. Besides seeing positive social implications, some also noted that progress and innovation should not be sacrificed (e.g., "New products and innovation should not stop.").

"[..] sounds obtainable and preferable" [Woman] "[..] sounds like something we will all need way more, to reduce the production and transportation footprint."[Man] "[..] not only reasonable, but it will probably be necessary." [Man]

A future with the potential to be positive, but there is scepticism toward its feasibility. This category captures responses that treated circular futures as desirable and positive but, at the same time, mentioned challenges to their implementation or even threats to individual freedom and structural barriers (e.g., wealth) preventing many from

"[..] sounds like a good idea, but I do not think that there are a lot of people that would agree to do this." [Woman]

"[..] sounds like an imbalanced future. I think it is good to share things, repair them at home and get by with fewer ones, but also a balance must be found between these two extremes. Sometimes it is good to repair, sometimes it is good to buy something new. To be forced to accept one or the other would mean that I lose my freedom of choice." [Man]

"[..] sounds like closer and closer for a group of specific people, who are committed and have the resources like time and money to live this." [Man]

A future that is pessimistic or cannot be achieved. Finally, the last category included negative attitudes toward a circular future. Frequently, these were expressed by a single word - "Utopia" or "Idealistic". Some respondents also listed that such a future is impossible in the resource-demanding nations of the Global North or expressed low expectations for people to engage in circular consumption practices.

## "[..] sounds like it is the present in much of the world. In Denmark, it is a Utopia. People are too spoiled and won't sacrifice the luxury." [Man]

"[..] sounds impossible. I would love to see the 1% sharing cars with the less fortunate." [1%]

"[..] sounds like something from the past that in today's society would be difficult to achieve, even with the greatest desire to do better for the environment. It's a fast moving world and people value their time more than ever, no wonder there's a saying "time is money" [Woman]

"[..] sounds like not what it seems. Usually these utopic scenarios are missing out on the variables and they rely too much on the universal good will of people. If you want to get everyone to think and act in a certain way, it sounds more like dictatorship, regardless of how good the intention. And if you don't like sharing and prefer owning, it can easily sound like a nightmare." [Woman]

#### 5.4.2.5 The role of gender in circular futures

Given the overrepresentation of women, it was impossible to determine gender differences for the envisioned futures by comparing the number of responses in each category. Furthermore, although this imaginary question was mandatory, more men than women entered only a combination of letters before submitting the survey, making the men's sample even smaller. Therefore, instead of looking for between-group differences, we considered the main trends within each group.

The results showed that women tended to envision considerably more benefits of circular consumption on the environment and nature. In fact, women were more likely to use affectious words such as ideal, amazing, great, exciting, fantastic to describe the positives of closed-loop futures. Some women also mentioned that circular futures can lead to a more balanced and meaningful life.

Men, on the other hand, also used positively-charged words (e.g., great) but more frequently mentioned other attributes such as practical, normal, possible, sensible, or interesting. Although men expressed the need for transitioning toward circular futures, several respondents highlighted the importance for continuing innovation and new development. Compared to Swedish men, the respondents in the combined Danish-English sample provided more doubting views, suggesting perhaps their more pessimistic view on circular futures. However, the pessimistic visions could be also found among women, who listed notions of utopia, impossibility, or warned against political and cultural issues. Finally, several women and men expressed that circular futures are inspiring but challenging to achieve. Typically listed challenges were inconvenience, lack of time and resources, and the need for behavioural shifts. Lastly, the perceived benefits of circular consumption might increase the risk of rebound effects as illustrated by one respondent who stated: "[..] sound like heaven! More money for travelling!"

#### 5.4.3 Next steps

The survey results confirmed several findings found during the literature review. For example, the strong connection between women's perception of circularity and their care for the environment. Or the men's preference for repair

and more practical outset on circularity. At the same time, the practice of sharing and leasing scored lower in both groups, pointing to a shared pool of barriers. The survey result gave a further understanding of how gender affects attitudes and practices of circular consumption within the local context. With this knowledge, we moved to scheduling and planning for qualitative interviews.

#### 5.5 Interviews

Following the surveys, our choice of semi-structured interviews was motivated by the recommendations to enrich quantitative data (i.e., our survey results) with qualitative insights to create more mixed and reliable data samples (Bjørnen, 2015). Furthermore, during our desk research, we observed that qualitative methods, such as interviews and observations, are typically recommended for researchers interested in understanding the dynamics of consumer practices and behaviours rather than only looking for consumers' attitudes and preferences (Arnould & Thompson, 2005). However, as we had limited time and not all practices could naturally occur during the period of our research (e.g., the need for repair), we opted for interviews instead of observations. Furthermore, applying the method of semi-structured qualitative interviews still allows people to reflect, reason, and share their thoughts about their daily practices and to do so even for situations that would usually be impossible or even intrusive to observe (e.g., using reusable menstruation products or changing reusable diapers) (Fuentes, Hagberg & Kjellberg, 2019). Finally, we were aware that discussing ways people could consume more sustainably can induce shame and negative feelings about their own consumption. Therefore, we followed the advice by Evans (2002) to avoid focusing only on unsustainable behaviours (e.g., waste generation) and consider broader practices people engage in and their general perspectives on consumption.

As we were interested in exploring practices (i.e., routinised and ordinary patterns of doing) rather than collecting data about attitudes or personal preferences, we took inspiration from the Practice Theory to help us structure the interview guide and support our subsequent analysis of the interview findings (Appendix 8). According to Warde (2022), the Practice Theory represents a broader stream of research approaches investigating people's social world (e.g., norm, meaning, routines, or shared knowledge) instead of zooming in on individual behaviours. Therefore, rather than decision-making and reasoning, which are typically in focus when considering consumption from a psychological perspective, practices invite for investigation of routinised flows of doing (e.g., showering, cooking, cleaning, listening to music, reading) and can be deconstructed to meanings, competencies, and materials (Warde, 2015) (Figure 23).



Figure 23. Schematic overview of the key elements of social practices. The model adapted by the thesis team from the original by Shove et al. (2012, p4).

Therefore, using the inspiration from the Practice theory, we structured our interview questions to understand the different meanings, needed skills and competencies, and important materials tied to various circular consumption practices.

#### 5.5.1 Interview structure

All interviews were scheduled to last between 30 to 40 minutes and offered to be conducted in-person or digitally, depending on the person's availability and location. However, only two participants were interviewed in person, and the rest opted for the digital format. All digital interviews were conducted through Microsoft Teams and, following the consent from participants, transcribed via the native Microsoft Teams transcribe function. Therefore, no interview was audio or video recorded. Lastly, all participants were interviewed separately except for ID10, where we used two interpreters to translate between spoken and sign language.

Each interview was divided roughly into two parts. First, we engaged in a general discussion on participants' daily consumption and consumption habits across various life domains (such as clothing, food, or electronics). We also asked for their reflection on the concept of sustainable consumption and the extent to which they have heard about a circular economy (CE henceforth). Following that, we transitioned to the second part of the interview, where we asked participants to reason and reflect on the following circular consumption practices: keeping things for longer, reducing consumption, repairing, purchasing second-hand items, sharing, and recycling. Here, we inquired about participants' familiarity with these practices, their opinions and thoughts on consuming circularly, and the extent to which they had previously engaged with any of the abovementioned practices.

#### 5.5.2 Participants

We recruited a total of 11 participants (Table 9) using our private networks, social media, and the email addresses left by the survey participants interested in further discussions on circular consumption. Among the participants, women (n=6) and men (n=5) were represented nearly equally and none of the recruited participants identified with another gender identity.

Most participants were between 20 and 30 years old, highly educated (having either a bachelor's or master's degree), and resided in Copenhagen. However, as many were also students, they generally had a lower income than their working peers or other age groups. Furthermore, although the majority resided in Denmark, only one was born and raised in Denmark. Others came from other countries like the Netherlands, Romania, and Sweden. This diversity represents an important limitation to our interview results as ethnicity and cultural backgrounds influence the ways gender roles are experienced and performed. However, the sample also reflects the reality of student project recruitment and the lack of funding to screen for and ensure access to specific population groups.

ID	Age	Gender	Household and personal details	
ID1	27	Woman	ID1 is from Finland and lives in Stockholm, where she moved from Copenhagen. She is ed- ucated in fashion design. She currently studies part-time and works part-time. She lives in an apartment together with her boyfriend.	
ID2	25	Man	ID2 comes originally from Greece and now lives and studies in Copenhagen. He lives alone in a student dorm where he shares some facilities with others.	
ID3	28	Woman	ID3 comes originally from Romania and lives now in Horsens (Denmark). She lives in a house outside the town together with her boyfriend. She studies graphical design.	
ID4	27	Woman	ID4 is originally from Poland and lives in Copenhagen, where she studies at a university and works part-time. She lives together with her boyfriend in an apartment.	
ID5	25	Man	ID5 is originally from the Netherlands and lives in Copenhagen, where he studies at a university and works part-time. Currently, he lives with a roommate in an apartment but will soon move into a new apartment with his girlfriend.	
ID6	26	Man	ID6 is from Denmark and lives alone in an apartment. He is currently studying at a university in Copenhagen.	
ID7	45	Woman	ID7 is from Romania and lives outside Copenhagen. She works as a full-time freelancer and coach. She lives in her parents' apartment together with her boyfriend and their two pets (a dog and a cat).	
ID8	29	Man	ID8 is from Romania and currently lives in Copenhagen, where he studies at a university and works part-time. He lives in an apartment together with his girlfriend.	
ID9	25	Woman	ID9 is from Romania and lives outside Copenhagen. She has just completed her master's studies and plans to apply for a PhD in Italy (where she previously lived). She lives alone.	
ID10	31	Man	ID10 is from Sweden and lives in Malmö. He is a full-time employee in the construction industry. He lives together with his girlfriend.	

#### Table 9. Overview of recruited interview participants

ID11	36	Woman	ID11 is from Sweden and lives in Gothenburg. She is a part-time employee and works with accessibility consulting and content production. She lives together with her boyfriend, and they
			are expecting their first child.

#### 5.5.3 Findings

The analysis of the interviews showed that the participants were relatively knowledgeable about different circular consumption practices and even engaged in several of them, although their motivations were not always strictly pro-environmental. Furthermore, their understanding of circular consumption was not only limited to the circular practices listed earlier (subsection 5.1.1), but it also included broader ideas of sustainable consumption (e.g., choice of ecological food, energy consumption, sustainability labels).

In the following subsections, we will detail the findings using several key themes related to the participant's general views on consumption and individual circular consumption practices. Within each theme, we will begin with insights from interviews with women, followed by those from interviews with men.

#### 5.5.3.1 Reflections on own consumption

The majority of the interviewed women identified themselves as conscious and responsible consumers. Several were highly concerned about the state of the environment and reported looking for more environmentally friendly products when shopping. However, they also mentioned that they did not always have this approach to consumption and that their perspectives have been shifting in the last years toward more need-based consumption.

When asked to describe their consumption habits, women would typically start by reflecting on decisions around clothes, shoes, and food but also smaller electronics (e.g., phones). Finally, more than half of the interviewed women reported also being vegetarian and frequent thrifters.

"I am struggling nowadays to understand what value actually is. I feel like it is so blurred and so far away from who I consider myself to be. Shiny cars, shiny phones, and new products do not really impress me [..] But it seems like it is a bit expected to have new stuff, and then you are kind of a better person, but I think it's actually the other way around [..] I'm trying to assess what I actually need" (ID4, woman)

"I am a conscious person, and I do not like buying, for example, too many clothes, and most of the time when I buy clothes, it's mostly second-hand." (ID3, woman)

Compared to women, the interviewed men described their consumption as standard and primarily driven by their needs. Although most of them reported being mindful in terms of limiting new purchases and avoiding unnecessary disposal of products, these actions were not directly motivated by pro-environmental values but instead linked to their general attitudes toward shopping or their current financial situation. Interestingly, when asked to reflect on their consumption and its meaning in their everyday lives, all men started by evaluating their use of electronics and technologies before reasoning about food or clothing. In contrast to the abovementioned responses by women, these reactions seem to reflect the gendered ideas of consumption. Furthermore, and to some extent in contrast to women who often looked for second-hand clothing, some men viewed technology as a domain they did not want to compromise on. For example, ID2 was willing to shop for second-hand furniture or engage in car-sharing services but preferred purchasing electronics (especially those with software) directly from a manufacturer.

"I will not care and buy anything until I know [..] that it is what I want [..] Is it cheap? I'll buy that one." (ID6, man)

"I would say that I am a relatively big consumer. I tend to shop a lot and would sometimes pay quite a lot of money. For example, I play golf, so I buy a lot of equipment for it [..] But I still ask myself if I really need the thing I want to buy before I actually go and buy it." (ID 10, man) Finally, given that most participants, including both women and men, were students, the discussions on consumption patterns were strongly tied to the limited affordability and access to various products and services. However, despite financial limitations and often choosing cheaper versions, men often listed the quality of materials and longevity as important drives of their purchasing choices.

#### 5.5.3.2 Reflections on sustainable consumption

As mentioned above, women identified themselves as having a strong focus on conscious and responsible consumption. Many were particularly distressed over the ongoing climate crisis and unsustainable consumption. For example, they saw a significant barrier to circular consumption in the overly individualistic lifestyles of the Global North (referring primarily to Nordic countries) and the high cost of sustainable consumption (e.g., ecological food, cost of repairs, or prices for sustainable clothing). Several women (e.g., ID4 and ID7) also mentioned their desire to protect nature and animals, but also to shop for responsibly manufactured products (e.g. ensuring no child-labour or unequal wages for workers). Therefore, these women reported spending more time researching companies and their production processes but often faced challenges in distinguishing sustainable products from greenwashing attempts.

However, women seemed to also suffer from a say-do paradox and rebound effects. Firstly, they experienced dissonance in shopping and often selected cheaper items (e.g., by fast-fashion houses like Primark) over sustainablylabelled brands (e.g. Fjällräven) as they felt the cheaper items offered them more durability and quality. Secondly, although being mindful of the sustainability of products, they admitted to spending money on take-out foods or travelling by plane. Furthermore, the willingness to shop second-hand was also limited to certain items (e.g., clothing or furniture). Some women reported buying new products if these items were more complex or technologically advanced (e.g., electronics).

> "I am thinking about how we harm the environment and how the next generations will be profiting or not [..] if we choose plastic today, we have to think that the oceans are not livable anymore for the animals [..] I do not see a very good future, even though I would like to see more sustainability in the future. But I do not know how we can escape it (note: environmental damage). I think that we have got to a point when the damage is so big, and we have so many habits around this non-sustainable life that I do not think we can escape it very soon."

(ID9 about the need for sustainable consumption, woman)

"I have always been a person that has a connection with nature [..] I love animals." (ID7 explaining her reasons for choosing to consume sustainably, woman)

"I don't understand it. So, if there is a t-shirt in Primark made of 100% cotton, and I touch it, and it is good-density cotton. Then there is a Fjällräven t-shirt that is also 100% cotton and has a similar feel. Then you are like, you trust the brand that says they do all those good things, but how can you be sure it is the case? Because of the marketing and positioning? It is always a difficult choice when it comes to also trusting what you found."

(ID4 on why she chooses shopping for cheaper items, woman)

In regards to men's knowledge and awareness of circular economy and sustainable consumption, the analysis showed that the majority had previously heard about these concepts. While most men acknowledged the necessity of transitioning towards more sustainable societies, they tended to associate sustainability and circularity with improved product design rather than an emphasis on reducing individual consumption or making lifestyle changes. However, despite men mentioning the importance of product sustainability and durability, most of them admitted to not actively seeking information regarding the sustainability of products online or consulting product labels. Only one participant, ID2, explicitly mentioned looking for sustainability certifications when purchasing new technologies. Nonetheless, the lack of attention to product labels cannot be simply explained by a lack of interest or awareness. For example, and similar to women, participants ID6 and ID10 mentioned their challenges in interpreting the labels and determining which of these are trustworthy or have a significant impact on protecting the environment.

"I want the stuff I buy to be at least certified to be sustainable, to be able to be recycled." (ID2 when reflecting on purchasing new technologies, man)

"It is hard to figure out which one of them (note: mentioning sustainable products and labels) are the good ones when it comes to actually spending the money on nicer stuff that is supposedly made more sustainably or more humanely." (ID6, man)

#### 5.5.3.3 The influencing role of women

As our survey data suggested, women might be more likely to initiate discussions regarding sustainable consumption among their family and friends. With this in mind, we were curious to investigate whether women in the lives of the men we interviewed (such as girlfriends or mothers) had a comparable impact on their attitudes towards sustainability. To explore this topic, we started by asking questions regarding shared decision-making within their households and typical ways more sustainable practices tend to be adopted and integrated.

When it came to women, they recognized some degree of influence over their male partners but were hesitant to generalise it on all types of consumption. Most commonly, they mentioned influencing diets at home and promoting a more vegetarian lifestyle. Similarly, they reported introducing practices of second-hand shopping for shared household items and furniture. However, they would often take on the role of researching and selecting the items, while men would typically pick them up. However, women also noted that men drive other types of sustainability discussions, like those concerning green technologies and energy consumption.

"I would say that I am the one who is influencing this area. I did not try to influence him, but he now eats less meat." (ID7, woman)

"He (ID4's partner) is working with a circular economy [..]. So I would like to say that we are both really critical towards consuming new stuff." (ID4, woman)

"It is a bit of a mutual situation where I tried to convince him that maybe we do not need the specific item and try to think creatively, what else could we be using [..] But he is a little bit forward-thinking when it comes to technology and energy consumption." (ID1, woman)

"I would agree that I am the one that is initiating these things and suggesting these things [..] If we need to look for a shelf, then it is me who will go on all those secondhand websites and look for the shelf and then bring some suggestions to my boyfriend [..] because I think it's fun." (ID3, woman)

When analysing data for men, the results showed that most of them began incorporating more sustainable practices due to the direct influence of women. However, this influence seems to be both contextual and limited. First, women are the primary influencers within households, meaning that men return to their previous habits in other contexts (e.g., work, spending time with friends, or visiting their families). To illustrate, ID5 has recently started eating vegetarian meals when dining with his vegetarian girlfriend but reverts to a meat-based diet when cooking and eating without her. Second, the impact of women's influence tends to be limited to certain types of sustainable behaviour (e.g., meat consumption, purchasing organic products, or drinking oat milk). When it comes to other circular practices (e.g. repairs), the likelihood of men engaging with these seems to depend more on their skills, resources, and existing infrastructure.

"My girlfriend sometimes insists on things like shopping for ecological and more natural products." (ID8, man)

"I buy fewer meat-based products now - because of my girlfriend. She prefers oat milk over normal milk, and she prefers the (thinking) fake meat basically [..] that is kind of a first time for me. I had never really tried that until we started eating together [..]. It has definitely influenced the way I make purchasing decisions when I know that I'm gonna be making dinner with her [..] On my own, I will still buy normal meat [..], but I do believe that when we move in together, she will definitely keep on influencing me [..] but I don't mind that. And I would do that for her. So that is not an issue for me to lean more towards the veggie replacements." (ID5, man)

"I think my mother is more environmentally friendly (note: compared to ID2's dad). She tries her best to actually make an impact, and she tries not to over-consume. I think seeing that influenced me." (ID2,man)

#### 5.5.3.4 Reducing consumption

Women's environmental concerns were the primary drivers of their attempts to reduce consumption. In other words, reduced consumption was an active choice through which women differentiate themselves from other consumers and other women. The reduction in consumption was also similar to consumption boycotts as women would both privately and publicly refuse to buy or get certain items (e.g., plastic bags).

"I am telling people in a store or somewhere that I do not need a bag. Do not give me another bag. I don't want plastic [..] For some people, it is for economic reasons [..] but I do not want to create waste if it is not necessary." (ID7, woman)

As most men reported basing their consumption on their current needs, they did not see themselves (except for ID10) as big consumers or impulsive shoppers. Their reported habits, such as evaluating their needs, waiting before purchasing, or sticking to the items they already owned, were all strategies to prevent over-consumption. However, as mentioned previously, these strategies were primarily driven by the lack of financial resources.

Besides not having the means to obtain better quality products, men did not report any considerable tensions between wanting to buy or own more and their values of consuming less. This lack of tension may be based on the nature of consumption reported by men, which centres mainly around technologies (e.g., computers, amplifiers, or mobile phones) and durable products (e.g., golf clubs or cars). Compared to clothing or make-up, these products last longer, are purchased in lesser quantities, and with larger gaps between each purchase (e.g., several years). This means that men might not face tensions to purchase new items on a weekly or monthly basis.

> "If I need to have another white shirt because my job requires it, then I'll go and buy a white shirt. But that's it. My clothes shopping is limited to what I need." (ID6, man)

#### 5.5.3.5 Prolonged use

For women, the concept of prolonged use was often associated with emotional attachments to objects (e.g., clothes or shoes), which often resulted in using them for longer. As the interviewed women were generally concerned about consumption, they expressed annoyance about products they had to frequently dispose of and replace due to hygienic reasons even if these were not broken or faulty (such as underwear, toothbrushes, and stockings).

Overall, women's practices of ensuring that their belongings last longer were centred around care. For instance,

when purchasing leather shoes, they expected them to last for several years and would clean and polish these regularly using recommended products or homemade remedies. They also followed product-specific instructions on how to take care of their possessions, such as using ways to remove limescale and avoiding using dryers. Finally, some (e.g., ID3) expressed frustration with many items marketed as sustainable and expensive and yet failing to last long.

"I am just sometimes too attached to them (note: clothes) sentimentally. So I feel like giving them away would hurt my feelings." (ID9, woman)

Ensuring that products last long was a key strategy among the interviewed men. Most reported using items (e.g., clothes, shoes, or small devices) until they stopped working or fell apart. The loss of 'usability', rather than aesthetics or personal attachment, was the key indicator for when the item was considered for disposal. To keep items in use, men deployed several strategies, such as following instructions (e.g., washing at recommended temperatures), preventing overuse (e.g., by rotating shoes), maintaining function (e.g., tightening up screws), and engaging in repair. For ID5 and ID10, the idea of keeping things in use was also linked to personal satisfaction. They reported enjoying sharing with others for how long they had owned specific items, proving that they can extend the 'end-of-life' expected by manufacturers.

"I am using whatever device I own until it breaks down. The same applies to clothes, using them as long as they are ok to use." (ID8, man)

"I just like to make things run as long as possible when it comes to computers, phones, or laptop." (ID5, man)

#### 5.5.3.6 Repairing

In general, women seemed to be interested in repairing their possessions (e.g., clothes, shoes, electronics) to prolong the product's lifespan. They were open to the idea of repairing items themselves, especially clothes, or seeking professional help (e.g., fixing shoes and electronics). However, some women mentioned that the lack of infrastructure for repair (e.g., lack of repair shops) could be an issue. As all women moved to Denmark from abroad, they also reported experiencing language barriers and expecting a high repair cost, both of which prevented them from using repair services since they moved. Although some women noted minor repairs done by their partners, others admitted that their partners were not skilled enough to help with repairs. Interestingly, one participant (ID7) provided a first-hand experience of working in an electronic repair shop. She shared that while women were employed in the customer-facing parts of the business, all repairs in the workshops were done by men.

"But I am not [..] I do not really like it (pauses and thinks) I mean, I do not like the housewife style, I am not good at that." (ID7 reflecting on repair task she does in her home, woman)

"I do not know technical stuff, I am not super handy [..] he can do it." (ID1, talking about home repairs, woman)

Compared to women, the notion of repair was central to how men reasoned about their consumption. First, nearly all men (except for ID10) had some level of technical understanding of why things break down and how to repair them. The required know-how was sometimes very specific, meaning that men had to look for certain types of spare parts, including their exact measurements and qualities (e.g., for computer repairs). Secondly, men usually knew where to find the right spare parts (e.g., websites or shops) and how to use them. Often, they would follow instructions provided by manufacturers or use online video guides. Nonetheless, ID8 mentioned that sometimes repairs are not financially viable, as the price of some spare parts is nearly as high as for a new product. Thirdly, all men reported having a basic set of tools at home that they could use for minor repairs or refurbishments.

"I feel like I am a crafty person, so I will try to give my best before discarding an item to try to either repair or refurbish or something if possible [..] also depends on products. If I have the necessary tools, that could help me. I think I have like a basic set of tools that could work to repair furniture or maybe repurpose that furniture, maybe [..] maybe cut it in half, for example." (ID8, man)

"There is a company called Framework that is building these interchangeable laptops [..] fully user maintenance [..] if the screen breaks, no problem. Here is an extra part for you. And here is an instruction manual, so you know how to do that yourself [..], but you know, cars have been doing that for a long time. So, car repair manuals for mechanics and stuff like that are common." (ID5, man)

Now, as mentioned previously, the interviewed men came from technologically dominated fields (e.g., construction and computer science) and acknowledged their advantage in knowing how even more complex devices work. However, the idea of a 'repairman' was not only based on their skills and available materials, but seemed also to be a part of their identity (e.g., "I always try to fix it", "I am a crafty person", or "I would always try first myself") or something they learned in childhood. This points us again at the gender division of labour.

> "I think it also runs in my family. When I am back home with my parents, my father tries to repair most of the things." (ID2, man)

Finally, men reported low engagement in repairing their clothes or shoes. Although some received sewing training in school (ID6) or the military (ID2), they rarely tried to fix their clothes (except for ID2). If a piece of clothing was damaged (e.g., got a hole), they used it instead as homeware or discarded it. Alternatively, men would ask someone else, mainly women, to help them mend the clothes (e.g., ID2 and ID10). However, men hesitated to pay for professional tailoring and clothing repair services to fix damages to their clothes. Instead of mending, they imagined using them for adjustments (e.g., shortening the length of pants).

"If any of my clothes, for example, got ripped [..], then I'm not sure if I'll go and try to get it fixed. I'll just buy a new one." (ID8, man)

"I don't personally do it (note: repair) on clothing. If I get a hole in a piece of clothing or something like that, it usually becomes at-home clothing [..] or when I used to have a car that I worked on, then those become garage or cleaning rags." (ID5, man)

#### 5.5.3.7 Sharing

The sharing practices were less prevalent among women, although several used car-sharing services. However, women reported worries about product faults and loss of convenience as the main barriers to sharing. Some (e.g., ID3) also mentioned that sharing or renting costs can exceed the price of new purchases, making the sharing options less desirable.

"A new store just opened up here [..] It is a shop where you can borrow things like clothing for a month. You can rent them. And I was like, oh cool, so I went there [..] Of course, fancy brands! Renting a skirt for a month would cost you 60 euros [..] that is more or less what I would spend on a good quality skirt if I did my research." (ID4, woman)

"I do not really see it happening for us because we are a little bit more spontaneous when it comes to just going places. [..] Maybe, if it (note: a shared car) would just always be in front of our house [..] But I do not mind lending my car to others. For example, if it fits our schedule or we are not in the city." (ID3, woman) On the other hand, men were more open to the idea of sharing and would often pass on or lend their things to family members or friends (e.g., headphones, tools, or kitchen devices). Several men have previously tried and enjoyed car sharing but highlighted, similar to women, the drawback of the service being less flexible than owning a private car. Moreover, some men reported seeing tool-sharing services or initiatives like libraries of things. However, they only had a few direct experiences with tool sharing, which they also ascribed to their language barrier or lack of knowledge about sharing options in Denmark.

"Basically something that I need for a one time repair for my car for example and it's a professional tool [..] Not worth it for me to purchase it for the one time that I need it so then I can rent it and I would happily do that anytime." (ID2, about car sharing, man)

"I think it's really convenient. I think it's a really good idea." (ID5, man)

Finally, men also listed several barriers to sharing. Besides the issue of convenience and flexibility, they were primarily concerned about the maintenance and hygiene of the shared tools. For men, not being able to know how others used the tools and for what, was the main source of distrust toward sharing services.

"I like to take good care of my things, but I am not sure how about the others who borrowed them before me." (ID8 about barriers to sharing, man)

"When it comes to like tools and those kinds of things, I mean the vacuum cleaner or like cleaning products is kind of like a bit icky depending on the hygiene levels [..] because you never know what the other person before you has cleaned with it [..] but if it is like a garage tool or something I am going to use on a car or as a gardening tool then yeah [..] But from a hygienic perspective, maybe you just have to clean the handles and those kinds of things."

(ID5 about barriers to sharing, man)

#### 5.5.3.8 Purchasing second-hand items

Overall, shopping second-hand, going to flea markets, or swapping clothes was embraced by all women. Besides finding new items, second-hand shopping was also depicted as a social and entertaining activity as it could take up a whole day. Nonetheless, women also reported that second-hand shopping is a time-consuming activity with high levels of uncertainty, as the stores might not have the items they need. Moreover, some second-hand and vintage shops would sell products at higher prices, making second-hand shopping potentially more expensive. Lastly, women listed several items they would not shop second-hand, such as underwear, glasses, or shoes.

"I love it [..] Of course, there is some trash, but I know a few good second-hand shops that would also have good prices. Because again, in many places buying secondhand is more expensive than going to UNIQLO or any other regular store. So that is why I sometimes choose to shop there instead of second-hand." (ID4, woman)

"I am a conscious consumer and [..] I always consider buying second-hand first [..] I think that it started with shopping for second-hand clothes. But now it is also something I do when I need stuff for the apartment [..] It is becoming more natural for me. I will first check the second-hand sites, and then if I cannot find it and I need it urgently, maybe then I will go buy it new."

(ID1, woman)

Compared to women, men were less likely to engage in second-hand shopping, especially when it comes to clothes. Furthermore, they had concerns about security when buying second-hand electronics.

"If you go to sites like DBA or marketplace, they might sell something that is well preserved, but you also do not know if it has not been stolen [..] And it is a little bit tricky with cyber security, especially when that device has an operating system [..] you do not know what might lurk inside the machine. I prefer to go buy new, and that has to do with trust. I trust the company that I buy from." (ID6, man)

#### 5.5.3.9 Recycling

Finally, women were big recycling promoters and claimed to always sort trash in their households. As a result, they were aware of the missing recycling practices in public spaces, offices, or during large gatherings (e.g., festivals) and found these situations annoying. As mentioned before, the interviewed women came from countries other than Denmark and would typically praise the Danish recycling system and compare it to the recycling infrastructures in their home countries.

"My belief is that right now, we have the technology to recycle everything. Only that it is not the main interest from what I see in the world." (ID7, woman)

"If you ask me about that division at home, I think I am the policeman when it comes to trash sorting because my boyfriend sometimes just dumps something, and I'm like: Excuse me, is this bio? No! [..] I don't think it (note: trash sorting) takes a lot of effort anymore [..] if you do it smartly, then you can have three bins [..] And I always lived in super tiny spaces, and I would always recycle." (ID4, woman)

The results showed that the interviewed men were more likely to recycle when there were recycling bins and infrastructure present in their environment. This suggests that accessibility was a key factor in determining recycling behaviour. Therefore, the men's recycling habits varied based on the location. For example, recycling was reported easier at home but less desirable at school or work when the recycling infrastructure was not available.

"I am getting better at it. Sometimes, I am just lazy [..] For me, it has a lot to do with how easy it is to recycle. If the bins are these, I do it. But I do now sweat about it if there are no recycling options. Also, I would not just keep empty containers in my bag and throw them later. It is a bit overkill..." (ID10, man)

"I do my best to sort out the garbage [..] Here in Denmark, I feel like that is pretty easy. It has a lot to do with how the garbage system is set up. And that is good. Like, there is always a space where you can sort it properly [..] it is not something I have to actively think about."

(ID8, man)

#### 5.5.3.10 The changing nature of consumption

A number of participants, including both men and women, described their consumption as a dynamic and evolving aspect of their lives. They acknowledged that their consumption patterns have already changed in the past and are likely to keep changing in the future. It is important to note that as most of the participants were students, they expected their consumption to intensify or be oriented towards higher-quality products once they entered the workforce. Furthermore, as one participant (ID3) mentioned, some types of time-demanding circular consumption (e.g. upcycling) are more demanding to engage in once one gets older.

"I think we should specify that I am limited in my consumption because I am limited by budget [..] of course, as budgets change, consumption habits change [...] if you start earning a full-time salary, you suddenly see your monthly expenses going up, and you do not feel like you have changed anything, but yet your expenses are higher because you are just consuming more stuff." (ID6, man)

"My lifestyle has also changed a little bit in the recent period because I am transitioning from being a young student to more adult. But I am still aware of what I am buying [..] When I was younger, I enjoyed upcycling, for example, but I do not do that much anymore because of time"

(ID3, woman)

Regarding other important life events expected to affect consumption, the participants mentioned starting moving in together and starting families. Here, the expectation was that the consumption tied to such life circumstances would be hard to avoid or stay away from, given that it represents a particular consumption norm (e.g., preparing for a first child) that goes beyond their attitudes and values (e.g., having to buy things the child will need).

"Now, we are awaiting our first child, and it is kind of automatic that you google a lot and look for stuff. It is easy to just get on different websites and feel like you just want to shop, shop, shop! So, the focus on the environment is quite easy to forget." (ID11, woman)

"If I have a family, it (note: consumption) will increase a lot because once you have kids [..] they want a lot of stuff and probably you will buy them [..] This is unavoidable, and it is good because this is why you work. This is why you make money." (ID2, man)

#### 5.5.4 Conclusion and next steps

The interviews showed that while both men and women engaged in several practices and activities that are aligned with the circular consumption strategies, such as repair, recycling, or reducing, their motivations were different. While men's motivation was tied to practicality and cost savings, women were motivated by their concerns about the environment and even social sustainability (e.g., fair wages for garment workers). Furthermore, the gender divide was also more apparent in reuse and repair scenarios, while both genders showed reservations toward sharing. Moreover, the interviewed participants were a good example of consumers for whom gender strongly intersected with age and country of origin. For example, several participants coming from Southern and Eastern Europe mentioned growing up with circular practices (e.g., repairing or using less) and saw them, therefore, as easier to adopt. Furthermore, nearly all participants were university students who occasionally had to engage in repairs or find ways to make items last longer as they could not afford to replace them.

Finally, the interviews showed the temporal dimension of consumption, which meant that the participants expected their consumption to increase as they aged or as their life situation changed. This is an important finding for designers but also for policymakers, as many recommendations and policies might not consider the element of time or pay little attention to which groups (e.g., transitioning to the first job, having a child) might need more support.

#### 5.6 Conclusions of the Discover phase

The Discover phase focused on understanding the impact and manifestation of gender and gender role in circular consumption. First, we conducted an additional literature review showing that, regardless of one's gender, the transition to circular consumption faces multiple challenges and barriers. For example, increased consumption work often means that certain activities, such as repair, become too time-consuming for people to engage with. Furthermore, we also gathered research evidence demonstrating different levels of involvement and engagement with circular consumption between men and women. The subsequent online content analysis further indicated that women seem to be the 'face' of sustainable and circular consumption. This broad understanding helped us transition to conducting primary research, which consisted of a survey and series of interviews and confirmed the hypothesis that circular consumption experience is gendered.

# 6. DEFINE

Following the broad exploration of the Discover phase, the Define phase aims to synthesise findings and make sense of the collected data. According to Penin (2018), the focus of convergent thinking should be on identifying main themes and spotting recurring patterns. The Define phase can also be supported by visualising data and communicating research results with broader groups of stakeholders and decision-makers (Stickdorn et al., 2018).

We will begin this chapter by synthesising research findings into several clusters. This activity strives to create a base for our expert interviews which we will conduct with a total of six service designers and other relevant experts. Following that, we will map the problem space, showing the complexity of the thesis focus and the diversity of challenges services designers face when engaging with intersecting issues, such as gender and sustainability. Finally, we will present a refined problem statement focusing on building gender sensitivity within circular design projects.

It is important to note that our processes did not follow a two-step path of collecting all data (i.e., running the Discover phase) and then engaging with their analysis (i.e., executing the Define phase). Instead, as the previous chapter showed, we have continuously reflected on the discovered insights and used them to gain a better understanding of the next steps. For example, during our literature review, we discovered evidence of women's influence on men's sustainable consumption. We used this insight in our survey and interviews to inquire specifically about this phenomenon and thereby complemented the secondary findings with primary data. According to Kimbell (2015), this iterative data collection and the sense-making process are foundational for working with exploratory qualitative data and differ from traditional scientific research, during which quantitative data collection and analysis are clearly separated.

This chapter consists of the following sections:

6.1 Introduction
6.2 Key findings
6.3 Expert interviews
6.4 Mapping the problem space
6.5 Refined problem statement
6.6 Conclusions of the Define phase

#### 6.1 Introduction

The Define phase plays an important role in understanding how the challenges and needs discovered during the previous research phase exist across different user groups or contexts. This requires designers to engage in convergent thinking, during which the broad learning perspective they applied during research shifts toward a generative view, allowing designers to discover patterns and themes in the collected data (Penin, 2018). To achieve this view, service designers can engage with a variety of methods that allow them to craft personas, map journeys and systems, or translate their insights into job-to-be-done (Stickdorn et al., 2018). Given that our thesis does not study a specific service or wishes to understand the needs of a particular user group but instead focuses on a broader exploration of two intersecting fields (i.e., gender and circular consumption) and their implication for service designers, we decided to primarily focus on clustering key findings.

While the focus in the Discover phase was primarily on the existing research and practices performed by citizens, in the Define phase, we will turn our attention to service designers. We will use the clustered findings as talking points for a series of expert interviews during which we will communicate our results and engage in a discussion about designers' experience, understanding, and readiness to include a gender perspective in their research and design. Finally, we will use the findings from the interviews to map out the problem space for this thesis and refine the initial problem statement.

#### 6.2 Key findings

The path toward creating main findings requires designers to review the research data, compare their notes, and even re-visit transcripts or artefacts collected during the research phase. Given that design research often resurfaces and uncovers various needs and challenges, it is important to collect and cluster these into meaningful categories and patterns (Penin, 2018). However, given that the grouping process is subjective and that qualitative data analysis often faces validity concerns (e.g., given the relatively small number of participants), we discussed ways to ensure the higher validity of our key findings. Therefore, we decided to follow several tips provided by Bjørnen (2015) to increase the reliability and validity of our research. These included triangulation of evidence (i.e., comparing data from different sources), reflection over own biases, and using peers as debriefing partners. The following sections will briefly describe our sense-making process and will conclude with an overview of the key themes.

#### 6.2.1 Preparation

Our first steps were to prepare all the research material for analysis, which meant printing key figures from the survey, collecting main quotes and findings from the interviews, and making mind maps from desk research insights. At this point, we kept the materials and our research wall primarily digital, using programs such as Miro, OneDrive, and Google Drive, as our physical workspace at the university was limited in space. Nonetheless, digitising the findings also helped us quickly navigate them once we approached the triangulation process, during which we looked for between-data sets comparison.

#### 6.2.2 Self-reflection

As the next steps, we included a short self-reflexive exercise to understand different factors that might affect our approach to the activities in the Define phase. The exercise is designed by Kimbell (2015) as an effective method used at the beginning of design projects to reflect over own values, capabilities, barriers, and hopes for change by asking a simple question about what matters to designers and why. However, we used the tool as a springboard for our sense-making activities and modified the template to fit our needs. For example, while the original tool included a matrix inviting designers to position themselves based on their responses to the tool's questions, we removed the scales and made the tool more static. Furthermore, we reworded one question to focus more on our approach to sense-making rather than the project start.

In accordance with Kimbell's (2015) instructions, we individually answered the questions placed around the agreed-upon key challenge, namely navigating the sensitive topic of gender without stereotyping (any gender) and oversimplifying anyone's experience. Then, we discussed our responses as a team, categorising them into five main groups (Figure 24)

• Our first area of focus was identifying who our project is accountable to and why, as well as the potential barriers and issues our research conclusions may face. We determined that we were formally accountable to each other, our supervisor, and the study program. Additionally, we listed the service design community, represented by our recruited experts, as stakeholders who will be affected by our results. In other words, we

were responsible for ensuring the validity of our findings if we hoped to spark discussions and engage in deeper conversations with the experts. We also acknowledged the broader accountability we have to those affected by the inequalities of circular consumption.

- As for the challenges we may face, we recognized issues with our data sets, which include an overrepresentation of young and highly educated individuals. Furthermore, many research participants were women. Therefore, we were concerned about the further feminization of the issues (i.e., presenting our research as problematic only for women) and the lack of male designers and their perspectives on our findings.
- Next, we reflected on our process and resources, acknowledging the limited time allotted for the thesis process
  while also recognizing the benefits of having access to our supervisor and academic literature, both of whom
  we could consult if we were to experience problems or conflicts in mapping the key insights. Along the same
  lines, we examined the quality of bonds we have with different places, people, and institutions. While we had
  strong ties to other students and the academic environment in general, we also recognized the challenges of
  obtaining perspectives from service design professionals (especially men) and businesses, as we have looser
  ties to these groups.
- The final set of reflections focused on our aspirations for change and the potential avenues through which it can be achieved. Our collective wish was to leverage our insights to equip service designers with new knowledge on possible gender-based disparities of circular consumption, which could be important and relevant to their work. We hoped to present our insights in an engaging and perhaps thought-provoking manner, as we hoped to inspire designers to further research the topic. Additionally, we hoped to use the case of gender to point out the importance of engaging with the social dimension of circularity and, thereby, highlighting the importance of service design in circular economy projects.



Figure 24. Self-reflection exercise. The adopted and modified model by Kimbell (2015, p30).

## REFLECTION

Pausing the process and engaging with self-reflection was helpful as it allowed us to align on how to proceed further and point out several challenges tied to our topic and the project. In addition, we reflected on our own biases, viewing this problem from the position of two women. For example, we discussed that we often envision women when considering sustainability or activities associated with care (e.g., about nature, animals, or other people). Furthermore, we looked back on our previous projects where we aimed to recruit mixed groups mainly for the purpose of gaining a representative sample instead of truly investigating the lived experiences of different genders.

#### 6.2.3 Sense-making

Following the preparation, we began the process of sense-making by creating a system for validating the relevant insights. As explained by Bjørnen (2015), triangulation requires designers to have access to data from different sources that together provide evidence to validate identified insights. Therefore, our approach was to use two sets of colour coding. While the first denoted source of information (e.g., literature review or survey), the second (used a background colour) referred to the overarching topic the insight addressed (Figure 25). Given the amount of data, we were specifically looking for themes related to our initial problem statement. These were, for example, differences in how women and men engage with circular consumption, the types of practices typically performed by women and men, or possible inequalities in how circular consumption impacts the two genders. Although finding evidence in all sources was not always possible, we aimed to have at least two supporting pieces of research behind each theme.

Similarly, we were paying attention to themes where the research provides disagreeing findings, although we experienced only a few. For instance, both instances of desk research (i.e., scholarly and non-scholarly findings) raise a central concern that circular consumption will add to the invisible labour performed by women in households. While the survey results seemed to support this finding by listing lack of time among frequent barriers to engaging in circular consumption, the qualities of the imagined futures provided by the survey respondents were mainly positive and negative views were reserved for the feasibility of such circular transitions in the face of the current consumer culture and individualistic values within society. Furthermore, none of the interviewed participants linked the additional effort (e.g., searching for second-hand clothes or repairing a device) to concerns about demanding household labour. On the contrary, the participants described their circular practices as entertaining and satisfying. Nonetheless, we interpret these cautiously, acknowledging that none of the participants lived in a household with children and that circular consumption was an active choice rather than a new lifestyle imposed by policies.



Figure 25. An example of insights clusters created during sense-making sessions

Over two separate sense-making sessions, we derived a multitude of themes which we continued grouping into clusters. For example, the themes describing Labelling women as responsible and Feminisation of sustainable consumption were grouped into a broader cluster of Circular consumption: eco-friendly and gendered. At the end of the second sense-making session, we arrived at a series of clusters with key findings.

#### 6.2.4 Key findings

The key findings represent the main patterns found across the collected data. Each cluster is described in a short headline and extended by additional findings related to the theme. Notably, the presented themes cover only the intersection of gender and circular consumption, as we were yet to explore how these findings relate to service design.

Consumption is gendered	Circular consumption: eco-friendly and		
<ul> <li>Consumption of products and services is shaped by one's gender identity and gender roles promoted in a given society.</li> <li>Women are often associated with household (e.g., food, cleaning supplies, or clothes for children) and personal purchases (e.g., fashion or make-up) and are often labelled as being bigger consumers.</li> <li>However, men are responsible for larger greenhouse gas (GHG) emissions as they engage in more carbon-demanding and conspicuous consumption (e.g., meat, cars, watches, or technologies).</li> </ul>	<ul> <li>gendered</li> <li>Women and men approach circular consumption differently.</li> <li>Compared to men, women are more involved in sustainability and willing to take on circular practices.</li> <li>Compared to men, women feel more responsibility and urge to act sustainably. However, they are also ascribed more responsibility by men based on the stereotypical view of a 'female shopper'.</li> <li>Compared to men, women are also more likely to purchase sustainable products or engage in second-hand shopping.</li> </ul>		
Men are high, women are low	Gender influences repair		
<ul> <li>Circular consumption includes activities with high- and low social value.</li> <li>Men typically engage more frequently high-value tasks (e.g., energy efficiency, electronics repairs or technological house improvements)</li> <li>Women typically engage more frequently low-value tasks (e.g., mending clothes, sorting waste, or shopping second-hand)</li> </ul>	<ul> <li>Compared to men, women are more likely to mend their clothes at home</li> <li>Compared to women, men are more likely to repair electronic and mechanic devices at home</li> <li>While both genders engage with professional repair, women are more likely to use the services for fixing electronic devices or repairing shoes.</li> </ul>		
Going circular means work	The gendered circular home		
<ul> <li>Circular consumption represents a paradigm shift that will affect the daily practices of all genders.</li> <li>By relying on the active participation of consumers, circular consumption increases consumption work.</li> <li>Most impactful circular practices (e.g., repair, sharing) might require more consumption work (e.g., doing repairs, organising sharing) than less impactful ones (e.g., recycling).</li> </ul>	<ul> <li>The division of domestic labour is gendered, with women spending more time on care and household tasks.</li> <li>Many circular practices increase consumption work in areas like cooking, cleaning, and shopping, which are more frequently done by women.</li> <li>Households are often the focus of circular consumption policies, resulting in increased domestic work. Circular consumption can put more pressure on women if systemic inequalities of domestic labour are not addressed.</li> </ul>		

The feminine vibe of circularity	The mutual influence		
<ul> <li>Circular (and broadly sustainable) consumption calls for values associated with femininity (e.g., care, motherhood, nature)</li> <li>Compared to men, women are more targeted by marketers, further cementing sustainability as a female issue.</li> <li>The perception of 'unmanly' consumption pushed men away from choosing sustainable products, leading to less targeting by marketers.</li> </ul>	<ul> <li>Compared to men, women are more likely to suggest new circular (and more broadly sustainable) consumption practices at home.</li> <li>Men are often influenced by women (e.g., girlfriends, mothers) to make their habits more sustainable (e.g., eating less meat or shopping second-hand).</li> <li>Compared to women, men are more likely to introduce energy-efficient and eco-friendly technologies at home (e.g., solar panels).</li> </ul>		
Same outcome, different motivations	Shared challenges		
<ul> <li>Although women and men engage in the same circular consumption practices (e.g., prolonged use), their motivation tends to vary.</li> <li>Compared to men, women ground their motivation primarily in concerns about climate and wishes to reduce their personal footprint.</li> <li>While men likewise admit environmental reasons, they are also motivated by the practicality and economic benefits of need-based consumption.</li> </ul>	<ul> <li>Circular consumption introduces several barriers, regardless of gender differences (although these influenced them).</li> <li>For example, sharing practices are often challenging for all genders due to their inconvenience, hygiene concerns, or lack of trust.</li> <li>Furthermore, both women and men report struggles in navigating what is and is not sustainable.</li> </ul>		
Just like gender, consumption is fluid	Intersectionality matters		
<ul> <li>Consumption is tightly linked to life events and changes over time.</li> <li>The way consumption evolves is influenced by social norms, including those linked to gender.</li> <li>Both women and men expect their consumption to change during major life events (e.g., becoming parents) and improved financial situations.</li> </ul>	<ul> <li>Gender represents only one social factor influencing circular consumption.</li> <li>The experiences of circular consumption are influenced by many other factors, such as age, ethnic background, or socio-economic status.</li> <li>For example, both women and men report barriers to purchasing sustainable products due to their costs.</li> </ul>		

Next, we decided to share our findings with two of our peers during a video meeting where we presented several of them and asked for their reflections. It is important to note that this review was informal, meaning that we looked primarily for feedback on how understandable the themes were before sharing them with the recruited experts.

#### **6.3 Expert interviews**

After formulating our key findings, we began planning and scheduling a new series of expert interviews by reaching out to several identified practitioners via email and LinkedIn. Our primary recruitment criteria for the selected experts were that they were either service designers (or similar) with experience in circular economy projects or service designers (or similar) focusing on gender-related topics. In total, we successfully recruited six practitioners currently residing and working in five European countries, namely Denmark, Sweden, Romania, Belgium, and Netherlands (Table 10). However, this diversity was a deliberate choice but the outcome of our personal networks and general LinkedIn searches, which promotes people with relevant expertise in their profile descriptions regardless of their location.

Furthermore, the experts' locations meant that all interviews were conducted via Microsoft Teams and, upon receiving consent, transcribed using the program's native transcription function. Similarly to the previous expert interviews in the Project context chapter (3.7.), all experts were advised not to disclose any project- or company-specific information that they would not feel comfortable or safe sharing.

#ID	Background information	Gender	Interview format
E2	Designer and Partner in a design studio (Belgium)	Woman	Digital
	<u>About the expert:</u> This expert has previously worked on circular economy projects and is also involved in various social innovation projects. Furthermore, E2 teaches and applies methods of system design.		
E6	Designer and Partner in a design studio (Belgium)	Man	Digital
	<u>About the expert:</u> This expert has previously worked on circular economy projects and is also involved in design work on transformation and system change. E6 was interviewed together with E2.		

Table 10. An overview of the recruited service designers and other experts

E7	Service designer design researcher in future of work fieldlab (Netherlands)	Woman	Digital
	<u>About this expert:</u> This expert has a background in Industrial design and works now as a service designer. During her master's thesis, E6 focused on gender biases in everyday products and spaces, using speculative and critical design methods to drive awareness among Industrial design students in the Netherlands. E6 currently works in a research facility exploring human-robot relations and works only limitedly with the gender theme.		
E8	Consultant in supply chain operations and sustainability in a large international consul- tancy house (Denmark)	Woman	Digital
	<u>About this expert:</u> This expert works as a consultant in a well-known international con- sulting company, advising various clients on the transition toward circularity (mainly in business-to-business settings).		
E9	Service designer and project manager for Sustainable Consumption and Circular Econo- my in a non-profit foundation (Sweden)	Woman	Digital
	<u>About this expert:</u> This expert has a multi-disciplinary background in behavioural science and service design. E9 works in a non-profit foundation established to help companies and initiatives in sustainable transition. E9 works with the topics of sustainable consump- tion (especially concerning food), one of the four key domains covered by the founda- tion's work.		
E12	Research and founder of a social innovation studio in design and sustainability (Romania)	Woman	Digital
	<u>About this expert:</u> This expert has a background in fashion and service design. Besides running her own slow fashion company, E12 researches and publishes on topics of sustainable fashion and circular business models in the fashion industry.		

#### 6.3.1 Interview structure

The purpose of the expert interviews was two-fold and can be summarised by the following research questions:

- How do the experts relate to and reason about the key findings from our Discover phase?
- How and to what extent do the experts work with gender-related topics in the context of their work, and what barriers do they face?

To ensure enough time for gathering insights for both questions, we divided each interview into two parts. First, we presented a brief overview of our key findings and engaged in a dialogue focused on the expert's initial reactions and previous encounters with similar findings. However, as most of the interviews lasted only 30 minutes, we had to select only some of the main findings (e.g., introducing the evidence for gendered circular consumption) that we considered necessary to spark the discussions and help the expert's present level of familiarity with recognizing and incorporating a gender perspective within their research and design projects. Here, we were interested in any challenges experts experience, given that our literature research suggested that gender remains a difficult and often unexplored topic among designers (Appendix 9).

#### 6.3.2 Findings

The expert interviews aimed to gain insights into the additional challenges associated with circular consumption and to explore the potential impact of gender on the adoption and performance of circular consumption practices. The findings confirmed the importance of paying attention to gender differences, and several experts (especially E7 and E9) even provided relevant examples from their work. However, the interviews also revealed the critical issue of gender inequality and the overall challenge of addressing gender within the design field. During the interviews, the emphasis on these issues was so profound that we often had to redirect conversations to ensure that we collected adequate feedback on the key research findings.

In the following sections, we will detail the main themes collected during the interview analysis. Although these are presented separately, they are largely intertwined and were continuously brought up during the conversations.

#### 6.3.2.1 The relatively known problem

The interviewed experts were aware of the gender differences in design, and several of them mentioned reading books or sitting in workshops that showed how "all design is male". However, only some were aware of how gender differences affect circular consumption. For instance, E7 mentioned that, compared to men, women are

more prone to consume sustainably, which might be linked to their identity built around relationships and care (e.g., concerns for society and the planet), while men construct their identity through consumption of physical things (e.g., car). Similarly, E3 provided reflections from her experience as a slow-fashion designer, suggesting that women are more interested in sustainable fashion products as they are bigger fashion consumers compared to men, who tend to keep a smaller wardrobe.

The experts also recognized the lack of a systemic focus on gender differences and how it increases the risks of designing services and products that do not fit women's (or other gender's) needs. To illustrate, E7 provided an example she discovered during her thesis research.

"I remember this research about the design of shared mobility tools [..] It was designed to work for long trips, which are mostly done by men, like long trips from home to work and from work to home. But the average travel pattern of women consisted of many more short trips. For example, from home to the supermarket, to the daycare, to the supermarket, maybe to visit an elderly friend or relative, to the dentist, and then back [..] so it would not make sense to find a new device every time they needed transport [..] so, they had to redesign it." (E7)

"Women do not need that much money in return (note: talking about returnable products). They are glad to return. [..] But men are much more rational when it comes to returning. You need to get a lot of money in return. It cannot take up too much space at home." (E9 about a project she is involved in)

#### 6.3.2.2 Reflecting on gender differences

The interviewed experts acknowledged and recognized the gender differences described in our findings (e.g., women inspiring men to consume sustainably) even from their personal experiences. However, they had varying views on what caused these differences. One expert, E8, did not necessarily attribute the observed differences in circular consumption to gender but rather to the volumes of feminine and masculine energy. This perspective, suggesting the existence of gendered energies, was interesting and was also mentioned by other experts we spoke with during the Develop phase, particularly those who were personally interested in circular and regenerative approaches. In the analysis, we looked for a definition of the two energies in research but could not find a cohesive definition, as the notion of feminine and masculine energy seems to be tied to different streams of psychology, spirituality, indigenous knowledge, and even religion. However, as the terms were mentioned several times, we believe that the term is used among the design community and therefore warrants a proper future investigation.

"When I had English, I had to read literature on the subject (note: energies), and I got very provoked in the beginning. But they talked about female energy being more like Mother Earth. We are kind of bound because we also give birth. But also that we take care of nature as our home, and we want to take care of that home to where we are bound [..] While masculine energy is faster, they fly around, they do not have anything they are bound to. So, that is when you (note: as a man) innovate, you do all of these things and take risks because you do not have to make a home and make that work [..] Maybe that is where we split [..] that could go for both male and female (note: both can have the energies) [..] It is really important for me to distinguish between being male and female and then also the energy because I do have male colleagues who have more feminine energy and more feminine views on the world." (E8)

The opinions of E2 and E6, who are working in the same company, also differed. E2 mentioned knowing many men interested in the topic and argued that their involvement gets overlooked as women tend to be more vocal about their enthusiasm for this topic. On the other hand, E6 believed in the influence of gender and suggested that women's and men's behaviour might centre around different social value systems. In another interview, E7 mentioned a similar thought and expressed her position on the ongoing discussions about the extent to which differences between men and women are innate by arguing that they are established during the different socialisation processes for girls and boys. "I do believe that men and women have the same potential to do things [..] you do not have naturally more interest in becoming a car mechanic if you are a boy [..] I think that's very much the environment, the context [..], and there are still a lot of people hiding behind stereotypes, not taking into account actual data if the data is even available." (E7)

Lastly, the interviews also showed that despite recognising the importance of gender differences, the experts also used other segmentation types and techniques to categorise and understand people's behaviour. For example, E8 mentioned working with consumer archetypes to understand what drives their sustainability choices (e.g., profit-motivated, community-motivated, or environmentally-motivated).

#### 6.3.2.3 Challenges in lifting gender perspective

Since nearly all our experts were women, we inquired into their experiences and possible challenges of lifting gender perspectives in their design or consultancy projects. Although we expected this to be an uneasy task given the gendered field of design (described in subsection 2.4.3.1), we were surprised by just how challenging that was for some experts. For instance, E7 shared that during writing her thesis, which was dedicated to gender biases in industrial design, she faced many pushbacks, including those from university lecturers, when trying to pass on her findings to new industrial design students in a series of exploratory workshops.

"There were so many professors that just did not believe that it (note: gender biases) actually was real [..] I always needed all these examples ready to convince them that this is an actual problem that we should look at, and it is very relevant [..]. And when you tell them (note: design students), it takes a lot of convincing [..] because none of their teachers is mentioning it in the courses [..] They maybe associate the topic also with extreme feminism and activism [..]." (E7)

Although E8 did not directly experience lifting a gender perspective, she felt strongly about sustainability. In her work as a consultant, she tried several times to emphasise the benefits of focusing on people and the planet besides looking only at the profit. However, she experienced that being a woman talking about sustainability made it more difficult to present these topics to her clients.

"Every time I mention something about the people, planet and profit [..], then I am seen as being naive and stuff like that [..] Sometimes I am actually afraid to mention these triple wins, for example, what you can get out of [..] reusing the resources that you already pay for or renting out things." (E8)

The risk of feminisation of circular consumption (and sustainable consumption in general) was recognised by both E6 and E7. In line with our previous findings by Cacouault-Bitaud (2001) on the feminisation of professions, E6 mentioned that sustainability might risk following the path of many other professions that became less valuable upon being associated with women (e.g., teaching) or women entering them (e.g., medicine). Similarly, E7 reflected that once a problem is framed as concerning women, it usually receives less attention, given that decision-makers and investors, still predominantly men, focus on projects related and interesting to their experiences and worldviews. E8 provided a similar perspective, mentioning that while her team included women, only a small number of women were among top management. Leaning back to her view of feminine energy, E8 reflected that the current situation would probably be different if more women were among decision-makers.

"If something becomes a female issue, then we already see this pattern that there is less attention for it, less funding [..] the people with the most money to invest in initiatives or new ideas are mostly men. And they tend to invest in topics that they can relate to and recognise. So it is also a risk to make it a female." (E7)

"In my team in the supply chain, we are two women, me and my colleague. We are consultants [..] but on the manager, senior manager, and partner levels, there are no females [..] They (note: male leadership) are the ones talking to the directors who are mostly males [..] I see that it is a really big problem and I think if female energy was at the top decisions, the world would look different already." (E8)
#### 6.3.2.4 Practical application

Besides understanding the ways gender influences various contexts (for both citizens and designers), we also asked the experts to reflect on how they believe we could approach gender differences when designing circular consumption services. Both E2 and E6 agreed that circular consumption could not be something that people are educated and convinced to do, but rather that circular lifestyles must happen by design. Considering that women are already pioneering different ways of being more circular and sustainable (e.g., veganism), designers could analyse their practices and compare these to men. Likewise, E12 suggested that designers more explicitly focus on differences in consumption between the genders but review their findings against societal norms and scripts that influence consumption (e.g., women are expected to take care of themselves). Finally, an important reflection was also provided by E7, who highlighted the need to collect gender-segregated data but also the importance of being sensitive and careful in their analysis and interpretation.

"The first step is to have segregated data [..], then you need to have the awareness that what the data tells you is not, per se, a truth [..] It is a pattern [..] So, for example, with car sharing (note: the example provided by E7 in 6.3.2.1). The difference in travel patterns is not because women really love to travel short distances. It is just that society puts care for the family, elderly, and children on them. It is not their natural role [..] So, you do not want to reinforce stereotypes, but you have to consider that it is how it is [..] So, it is a balance [..], but you still need good sex segregated data, tools, awareness of context influences, and you have to have an awareness of your own biases." (E7)

#### 6.3.2.5 Recognizing intersectionality

Several experts mentioned that circular (and more broadly sustainable) consumption is not only influenced by gender but also by other factors. For example, E8 highlighted that people's age could affect how they access circular solutions, as many circular initiatives are promoted or used with an app and require some digital competencies. Furthermore, E9 added the effects of class and socio-economic status, which besides the access to sustainable products, also impacts the volume and experiences of consumption work. She then critically evaluated the current approach to sustainability that often appeals and is targeted at those with the resources (e.g., time and money) to care. For instance, she mentioned that middle-class and upper-middle-class people might find sustainable consumption easier as they can afford to pay for fair-trade products or home deliveries. During our conversation, E8 reflected on her recent project concerning reusables, during which the design team recruited interested research participants via a newsletter. After a moment of thinking, she added that the interview results might have been different if they had gone to conduct the interviews at the central station. However, she also reflected that there is a cost tied to taking a more inclusive approach that is often outside the budget of many projects.

"It all boils down a lot to budget and economy [..] We did not have that much money to do these interviews [..]. And I think that it is even worse in commercial companies. It is a quick, dirty, low-hanging fruit. Easy accessible. (note: she pauses and thinks) I guess there is a cost to being inclusive." (E9)

Lastly, some of the interview experts (E2, E6, and E8) argued that the focus on the gender perspective in circularity, or the lack of it, also varies between countries, given that the concept of a circular economy is not equally popular or possible everywhere in the world. Furthermore, E6 stated that the binary view on gender and gender roles is also more typical for Western societies, whereas other countries (such as Japan) might assign men more agency and responsibilities in caring for nature.

"Ilt is really easy to be a white woman sitting in the happiest country in Europe and talk about how a circular economy is so important [..] If you go to another place, just Turkey, with three times as many people in the main city, and the problems with refugees and earthquakes, I think what is on top of the agenda are some other things." (E8)

#### 6.3.2.6 Conclusion and next step

The expert interviews gave us important insights into how designers reason about gender differences in the context of circular (and more broadly sustainable) consumption. At the same time, we felt that our research inspired the

experts and allowed them to view their past projects through a new lens. Interestingly, E6 decided to search for images related to his new assignment during the interview. In the assignment, focused on the future of train stations, E6 planned to suggest an increased presence of staff who could work similarly to retail workers and move throughout the station to better assist and care for passengers needing help. Inspired by our discussion, he searched images of retail workers, realising that the majority of these are women. This made him reflect on the idea of care and its gendered character.

However, the experts' different views on gender's influence made us reflect on the extent to which gender (and its systemic consequences like consumption work) was discussed as something designers can disagree on. We asked ourselves - is this a good thing? Given E7's reflection on the missing gender education and the lack of gender topics in our master's studies, we would say - it depends. It depends on designers being knowledgeable and having access to gender-segregated data.

Finally, we realised that we must avoid the pitfall of 'outsider' thinking which involves perceiving designers as agents who exist outside of the systems they want to change. Instead, we must acknowledge the fact that designers are embedded in these systems. Therefore, designer's gender identity could play a role in how they engage with a gender perspective. For example, the interviews and the previous desk research showed that gender influences designers' decision-making power or possibilities to bring up certain perspectives.

#### 6.4 Mapping problem space

Following the expert interview, we began mapping our problem space based on the literature review findings, the problem context exploration, and key findings from the Discover and Define phase. To help visualise how the key themes of our thesis overlap, we created a simple Venn diagram (Figure 26), placing our problem space at the intersection of gender, circular consumption, and service design.



Figure 26. A Venn diagram indicating the thesis problem space

Internally, we framed this diagram as 'Problems everywhere' because it shows how each intersection brings on new challenges for service designers. Firstly, the lack of service designers working with circular economy projects is caused by its technocratic and manufacturing focus as well as missing training in system thinking and sustainability. Second, the intersection with gender shows that service designers struggle to argue for including gender perspective or do not consider it particularly relevant. Furthermore, given the gender imbalance in the design field, many design disciplines, including service design, execute their processes in highly gendered environments. Finally, the combination of gender and circularity sits in the middle and represents, therefore, a significant challenge for our thesis team.

#### 6.5 Refined problem statement

Our initial problem statement focused on exploring ways service design can uncover possible gender differences and inequalities in circular consumption. However, the expert interview results showed that service designers face several challenges to do so, ranging from a lack of awareness and attention to the impacts of gender to barriers and inequalities within their teams and workplaces. Therefore, rather than focusing on the ability of service design as a discipline, we refined our problem statement to place service designers on the central stage.

How can we foster gender sensitivity among service designers, in the context of designing circular consumption services?

#### 6.6 Conclusions of the Define phase

In the Define phase, we began by synthesising data and looking for patterns across the different data sources. To increase the validity of our conclusions, we applied the technique of peer review and data triangulation before sharing our main findings in a series of interviews with several service designers and other experts. Following their feedback, we realised that we had to refine our problem statement to place service designers at the forefront of the issue and investigate their needs for overcoming the identified challenges rather than solely relying on the capabilities of service design as a field in ensuring gender sensitivity of circular consumption.

# 7. BETWEEN THE DIAMONDS

After refining the problem statement, our team was faced with a dilemma. On the one hand, we were eager to move forward with ideating potential solutions. On the other hand, we kept glancing back, wondering about the limitations of our citizen data sets - more specifically the lower number of male participants in our survey. Therefore, we decided to take advantage of this natural pause in the process and conduct a brief design experiment to gain any additional insights and perspective from citizens before moving forward.

This chapter is structured in the following way: 7.1. Motivation behind the design experiment 7.2. Materials and structure 7.3. Reflections on the experiment 7.4. Experiment findings 7.5 Final reflections

#### 7.1. Motivation behind the design experiment

We decided to use the method of a design experiment for two main reasons. Firstly, it offered practicality as we could easily set up, run, and analyse data from the experiment within a day. Also, by conducting the experiment at the university, we had convenient access to potential participants. However, we understand that this convenience may raise concerns about the education levels and ages of the participants since the majority would be younger and highly educated. Nevertheless, since most of our survey and interview participants were also highly educated and in their twenties and thirties, we were confident that the experiment around a series of future circular consumption practices taking place in 2033 (i.e., ten years from now) as we wanted to explore the extent to which the experiment participants would find such future practices desirable. Furthermore, we were curious whether the gender preferences identified in the survey and interviews would influence participants' desirability ranking given that we also, as part of the exercise, included some unconventional images that challenged the status quo by depicting reversed gender roles. For instance, we portrayed a woman engaging in dishwasher repair and a man sewing clothes.

#### What is a design experiment?

Design experiments allow participants to experience issues and possibilities of alternative futures that might normally be outside their reach (Munthe-Kaas & Hoffman, 2017). In the case of our experiment, viewing images from a possible future makes it tangible, allowing participants to form opinions about it, reject it, or start debating it. Therefore, as stated by Munthe-Kaas and Hoffman (2017), experiments strengthen democratic engagement as they create spaces for people to come together and engage in discussions, without needing to be experts or possess specific skills. Lastly, the staging of experiments, typically done by designers or planners, invites people to participate, challenge everyday thinking, or take on new roles (Munthe-Kaas & Hoffman, 2017). For instance, our experiment invited participants to take on the role of their future selves.

#### 7.2. Materials and structure

The experiment was carried out in the reception area of the university, using a black table as the primary setup. We attached a total of 11 printouts with future scenarios that we prepared the previous day. These scenarios consisted of an image sourced from Google, accompanied by a brief description that briefly elaborated on how everyday life unfolds in 2033 (Figure 27, see Appendix 10 for a comprehensive overview of all future scenarios). The set up also included a cardboard box The setup also included a cardboard box that served as a mailbox for participants to use when sending a postcard from the future to their present selves.

#### FIXING IS SEXY & COOL

In 2033, fixing things is as natural as it gets. What you cannot repair on your own can almost certainly be repaired in any local repair coffeeshop.



Figure 27. Examples of the future scenarios



YOUR NEIGHBOR IS YOUR ALLY In 2033, neighborhoods will be essential. Within neighborhoods, you can share spaces and tools or ask your neighbor for help.





The structure of the experiment was simple and required only around five minutes of the participants' time, although they were encouraged to stay and re-visits the scenarios or discuss them with others. However, for most participants, the structure was as follows. Upon agreeing to join the experiment, we briefed them that they had now travelled to the near future of 2023, in which all European countries had adopted circular economy principles. As a result, sustainability and a circular mindset were now part of everyone's daily life. We then handed them the voting dots (with colour based on their gender<sup>6</sup>) and asked them to walk around, read the future scenarios, and use the dots to rate how desirable or undesirable they thought each scenario was. Afterwards, we asked them to spend a moment and write a short message from the future to their present selves, sharing their thoughts and reflection on life in 2033. Finally, upon posting the postcard in our cardboard mailbox, we thanked them for participating and offered them candy.



Figure 28. Image documentation of the design experiment

<sup>6</sup> Originally, we aimed at having a single colour for each gender. However, we could only find one matching set of colour dots for men and had to use a mix of colours for women. Nevertheless, what started as a mistake turned out to be beneficial as the scales were filled with colours, making it harder for people to simply 'side' with their gender.

#### 7.3. Reflections on the experiment

The interest in our experiment was high, resulting in 54 participants joining our station in less than three hours. Contrary to our plan to recruit equal numbers of men and women, we ended with significantly more men (n=38) than women (n=16). This overrepresentation was caused by the timing of our experiment, which overlapped with a gaming event hosted at the university. However, this also led to a greater variety of ages, with the youngest participant being 16 years of age and the oldest 52. Nonetheless, the majority were in their twenties.

Given a large number of participants and limited space at the table, we could only engage in a few discussions as we had to continuously onboard, assist, or bid farewell to participants. Therefore, we put ourselves in an observer position and supported participants with further explanations or clarifications when needed. However, we noticed that some scenarios would typically lead to more verbal or non-verbal (e.g., laughing) reactions. As expected, the gender-role reversed scenario of repair sparked several discussions, with mostly men laughing but talking fondly about the possibility of repairing their clothes. Occasionally, both women and men would also point out that some things in the scenarios already exist today, such as car sharing and growing vegetables. Lastly, the recycling scenario was intentionally made provocative as it hinged a possibility of assigning social credit to well-recycling citizens. As expected, this was a scenario that made many participants pause and take a long time before voting. Some of them even turned to us and expressed their concerns about the idea of social credit.

## REFLECTION

The reactions of several participants to the recycling scenario hinting at the idea of social credit made us reflect on the importance of including elements of critical and norm-breaking design when working with alternative futures. Furthermore, we discussed the nuances that can flip a scenario from acceptable or even desirable to concerning and scary. Looking back at the recycling case, the rating (and its effect we also observed in several texts on the future postcards) would have likely looked different if the scenario relied solely on the images or if the wording 'earn citizen points' read as 'earn discount points'. To conclude, the exact words and visual nuances matter once we begin discussing preferable futures.

#### 7.4. Experiment findings

The output of the experiment was, besides the discussions and interaction with the participants, the rated scales and postcards from the future. When it comes to the desirability rating, the zero-waste lifestyle, shopping in zero-waste stores, recycling, and repair were among the most desirable practices for both genders, while the use of modular products was also popular among men. On the other hand, sharing and a so-called Mindful calendar (i.e., days focused on circular practices and environment care) were rated among the least desirable scenarios, especially by men. Similarly to men, women also did not find sharing desirable and were generally less enthusiastic about the use of modular products. The experiment also showed that some scenarios, like gardening, becoming an ally with a neighbour, or shopping-free futures of shopping malls, resulted in mixed reactions and fairly distributed responses along the desirability scale.

However, we have to note that the experiment was built around the ideas of seeing and thinking about data entered by previous participants, which might have influenced some of the ratings. However, we also observed a deep engagement and genuine curiosity about the circular futures, which on their own are important outcomes.



Figure 29. Examples of practices, rated on a desirability scale

Finally, we included examples of the postcards from the future (Figure 30) and will let these speak for themselves. We will only remind the readers about the above-mentioned effect of the social credit notion, which likely inspired the participants' future personas to warn their present selves.



Figure 30. Examples of messages on the poscards from the future

#### 7.5 Final reflections

By taking the time to pause and conduct the design experiment, we were able to gain additional insights to strengthen and expand our previous research results. In terms of gender differences, we could observe some discrepancies between women and men, especially in terms of preferences for modular products. Furthermore, the experiment has confirmed that sharing continues to be a significant challenge, while repairs are generally seen as a desirable method for products to stay in use for longer. However, the experiment also provided input on topics that are currently outside of the scope of our thesis but relevant when considering the social dimension of sustainability. The respondents' reactions to the idea of citizen points made us reflect on the need to study circular consumption and its design through other relevant topics, such as privacy, power, and control, especially when digital data and advanced technologies like AI might be at play.

# 8. DEVLOP

The second diamond covers two design phases: Develop and Deliver (Design Council, n.d.). According to Dan Nessler's revamped double diamond (Nessler, 2019; Penin, 2018), this stage requires designers to diverge their thinking again and engage in ideation activities that use the insights from the first diamond to develop different possible (initial) solutions, set the design vision and, lastly, collect some hypotheses that can be tested along the prototypes, during the last stage, Deliver.

We will begin this chapter with initial ideation, during which we will generate several ideas related to our envision thesis outcome - a tool for service designers. Furthermore, we will also review and analyse several existing tools and methods aiming at reducing gender inequalities and raising sensitivity to gender differences. We will then conduct four expert interviews to help us understand the possible needs, requirements, and expectations of designers toward a gender-sensitive tool for circularity. Combining the review findings with the output of our initial ideation sessions, we will define principles and develop the first concept idea, which we will evaluate in two expert sessions. Finally, we will conclude the Develop chapter with an overview of the next steps.

This chapter consists of the following sections:

8.1 Introduction
8.2 Initial ideation
8.3 Review of existing resources and tools
8.4 Expert interviews
8.5 Design reflections and initial principles
8.6 Concept idea development
8.6 Concept idea evaluation
8.8 Conclusion and next step

#### 8.1 Introduction

The first phase of the second design diamond, Deliver, encapsulates what Penin (2018) refers to as a process of building bridges between the research findings and ideation. By engaging with the previous research findings and learnings, designers can determine the boundaries and limitations within which they must initiate their creative ideation processes. Within these boundaries, a variety of ideation methods (e.g., brainstorming or brainwriting) allows designers to develop ideas and form early concepts for later review and testing (Patrício & Fisk, 2013).

As seen in the first diamond (chapters 5 and 6), stakeholder involvement was a central focus of this thesis, as we included the perspectives of both citizens and experts in discovering and exploring the intersecting topics of circular consumption, gender, and service design. In this chapter, we will continue to include external perspectives in our process. To do so, we will first invite several experts (designers) to share their ideas on how and through which format they would be open and comfortable learning about gender sensitivity in consumption projects. Furthermore, we will use expert feedback again in the evaluation of our early concept idea.

To summarise, this chapter invites readers to observe our ideation process, starting from our initial thoughts to setting the fundamental goals and principles for the project output. Furthermore, this chapter shows how designers can use expert feedback to refine these goals into clear and testable ideas. Lastly, the chapter provides inspiration on how designers can use design games to engage citizens in imagining and discussing consumption, especially when its future forms might be radically different from what they know today.

#### 8.2 Initial ideation

The divergent nature of the ideation phase invites services designers to immerse themselves in the creative generation of possible concept ideas and problem solutions. However, they must also remain receptive to the exact format and limits of the solution. Stappers and Sanders (2008) define this stage of the second diamond as the 'fuzzy front-end', as designers are yet to see clearly what the output of their process will be. Nevertheless, by understanding the needs of their target groups, as well as evaluating available project resources and limitations, designers have insights into what might not be desirable, feasible, or viable to develop.

Therefore, we began the Develop phase with an initial exploration of the different ways we can address the problem statement, taking into consideration the findings from the first diamond, the limitations of our thesis project, and personal reflections on what we believed was feasible to achieve within the remaining thesis timelines.

#### 8.2.1 Brainwriting session

The aim of the brainwriting session was to help us develop a large number of ideas on how to introduce and foster gender sensitivity among service designers, especially among those working in the context of circular consumption. However, to make our ideas more concrete and to help us prepare for our later interviews with experts, we centred our focus on answering a perhaps surprising question - *What is the <u>possible outcome</u> of this thesis project?* We call this question surprising because it promotes thinking about the outcome at a stage when we are in the midst of fuzzy beginnings. However, as mentioned above, the strategies and decisions made in such fuzzy starts are important in determining the project's later success (Stappers & Sanders, 2008). Therefore, we decided to follow a triple path to get the answer. First, this brainwriting exercise in which we will collect our own ideas about the possible outcome based on previous findings and our engagement with the project. Second, the review of the existing resources and tools (8.3.), where we will look for inspiration but also pay attention to possible gaps. And finally, a series of interviews with experts (in 8.4.) with whom we will discuss their views on how the outcome could look like to fit their needs and realities.

The brainwriting session lasted approximately two hours and was based on working in cycles of individual idea generation, sharing, and grouping of similar ideas into larger clusters. We chose the method of brainwriting, as opposed to traditional brainstorming, as it is a generally recommended and useful technique in situations when the design topic at hand is too complex to simply discuss or when a speaking format does not stimulate the working style of the participants (Stickdorn et al., 2018). While verbal communication was never an issue for our team, the exercise supported us in taking the time to reflect, form, and eventually communicate our ideas to each other. However, it is important to note that the brainwriting session's focus was not to develop necessarily feasible or elaborated solutions but rather to articulate or depict as many of our thoughts as possible about the outcome in response to the problem statement. Finally, we concluded the session with a short group brainstorming activity to add any additional ideas that were sparked by our discussions.

#### 8.2.2 Overview of clusters

We developed in total three clusters of outcome ideas: Compiling best practices, Assistance during the process, and Invitation to reflect. Each cluster contained an idea on what a possible project outcome could be while the clusters referred to a project state (e.g., reflection) or knowledge (e.g., best practices).

#### **Cluster 1: Compiling best practices**

The purpose of the possible outcomes within the first cluster is mainly to provide service designers with knowledge, examples, or how-to-guides on fostering gender sensitivity, either individually or with a team.

- A gender-sensitivity checklist for service designers to use before starting on a circular consumption project
- A gender-inclusion and sensitivity overview including a best practice list for fostering a gender-sensitive mindset that supports service designers in including all genders in their circular consumption projects
- A gender-awareness and bais self-assessment followed by a gender-sensitivity checklist
- A gender-inclusive and sensitive design guide for designing sustainable consumption services
- A systemic thinking tool to allow service designers to approach gender-sensitivity on a systemic level

#### Cluster 2: Assistance during the process

The purpose of the possible outcomes within the second cluster is mainly to provide service designers with help on how to foster gender sensitivity during a design process.

- A gender-sensitivity and gender-difference data collection tool that can be used by service designers during research activities in the first diamond
- A template for running a circular consumption and gender-sensitivity workshop with a defined timeline and application guidelines
- A refined double-diamond process that includes advice on how to include a gender perspective, either in a separate phase or as an add-on.
- A tool called 'Gender consumption lens' that can be 'put on' by service designers to view their findings and design solutions with a focus on gender differences
- An open-source community for gender-sensitive or genderless transition design, focusing on different challenges of circular economy

#### Cluster 3: Invitation to reflect

The purpose of the possible outcomes within the third cluster is mainly to provide service designers with tools and advice on how to reflect on gender differences before, during, and after their projects.

- A circular consumption storytelling booklet consisting of stories and scenarios service designers can use to practise empathy and sensitivity to gender issues in sustainable consumption.
- A question-based guide for service designers to use in reflection on possible differences.
- A set of critical personas and scenarios that service designers can use to reflect on and test their gender-sensitivity
- A set of thinking, talking, and doing cards to support reflection and action-based discussions about gender differences in consumption.
- A set of evaluation and testing cards to help critically review sustainable and circular service from the gender perspective
- A gender equality 'compass' as a tool to guide service designers towards making gender-informed and sensitive choices
- A card deck with snapshots of future consumption scenarios and extreme gender situations
- A holistic 'full picture' tool to help service designers take a systemic perspective on the impact of sustainable consumption policies on consumers

Once we clustered the ideas and spotted some recurring themes, we agreed as a group that a feasible outcome would be a design tool that could overlap the existing gap in service design tools and methods regarding circularity and gender. Since we were aligned on the idea of a tool or resource, we further discussed the impact we would like to see the tool have on the service design community. Using the brainwriting method again, we generated several possible areas of impact, for example:

- The initial round of possible areas the tool can tackle resulted in the following ideas:
- supporting service designers in understanding how their proposed solution impacts the different genders.
- enabling service designers to avoid or mitigate eventual negative consequences of their solutions (e.g. contributing unknowingly to increasing inequality or perpetuating gender biases or stereotypes).
- helping service designers to become aware of the bigger picture when designing circular solutions.

Although the initial ideas were naturally broad, they helped us align and prepare for the next step of the resources and tools review.

#### 8.3 Review of existing resources and tools

Following the initial ideation, we looked for existing tools, toolkits and methods that might combine a focus on circular consumption and gender. As we could not find any of these combining both topics and as we had previously conducted a short review of existing circular design tools (in chapter 3.5.2.2), we searched for available tools (or other resources) that deal with gender differences, gender equality or gender sensitivity in other contexts. Besides gaining an overview of these tools, we also looked for ways they deploy different activities, invite for reflection, use the tone of voice, or provide hands-on tools such as cards, posters, or templates. Importantly, given the limited budget assigned to this project, all reviewed tools were freely available except for the EQT The Gender Equity Toolkit, which is currently raising funding on Kickstarter to become commercially available.

### 8.3.1 Overview of reviewed resources and tools

We listed all the reviewed resources and tools in the table below (Table 11) and provided a short description alongside the intended target groups.

Tools (Author)	Intended target group	Brief tool description
CreaTures Framework (by <b>CreaTures Project)</b>	Artists, designers and other cultural actors	The website takes three years of research and collaborations with prac- titioners and turns it into an informative glossary of recommendations. It combines the focus on eco-social change, creative practices within art, design and other cultural fields and the future. Although the website does not directly tackle gender, it provides eco-change strategies that could be applied to fair and inclusive strategies toward circular consumption. Therefore, we included it in our review.
<b>The GenderWorks Toolkit</b> (by OXFam)	Women's organisations, campaigns organisers (e.g., dealing with gen- der, poverty, and social exclusion issues) and public institutions	This toolkit is designed like a manual, covering various exercises, sharing success stories and introducing case studies. It engages participants to tackle the topic of gender (in the context of poverty and social exclusion) through a wide variety of individual exercises and group discussions.
<b>Gendered Innovations</b> (by Stanford University and European Commission)	A broad groups of researchers and practitioners in fields like medicine, engineering, or the environment	This website provides both awareness and hands-on activities aimed at professionals and researchers working in fields like medicine, engi- neering, or the environment. The knowledge-based part of the website provides an introduction to the topic of sex, gender, and intersectionality. Next, the website introduces many methods to conduct gender analysis (e.g., rethinking concepts or surveys) or research in specific fields (e.g. social robotics). Finally, the issues of sex, gender, and intersectionality are exemplified through case studies.
<b>The Gender Equality</b> <b>Continuum</b> (by OECD DEVELOPMENT matters)	Development partners	The toolkit by OECD leverages the known gender equality continuum which stands for a scale from gender exploitation (and gender blind- ness) to gender transformation (and critical gender analysis for change). The OECD manual supports using the continuum to evaluate the impact of a program, intervention, or project, concerning gender sensitivity and/or gender equality.
Gender and Recycling: Tools for Project Design and Implementation: Regional Initiative for Inclusive Recycling (by IDB Inter-American Development Bank)	Social organisations, management or technical profiles with a stake in projects targeting inclusive recycling	Divided in three chapters, the manual covers a literature study, focus groups, and interviews with recycling specialists from several nations. It then identifies different relevant components and practices for successful inclusion of recyclers (looking at the difference between women and men). Lastly, it comprises advice on the inclusion of gender within each stage of a project, from data collection to analysis and discussions.
Reviewing design methods to make them more sensitive to gender (by the Scottish Government)	Public service workers that develop and/or design, with a user-centric perspective	This report covers a generalised overview of common problematic topics among women and girls. It aims to raise awareness and document some best practices that promote inclusion. Sixteen identified areas from desk- top research have been exhibited in a table presenting the problem area, its significance for user-centred design, as well as list the arising opportu- nities of the challenge, through best practice ideas and examples.
<b>Genovate Toolkit:</b> Promoting Sustainable Change- A Toolkit For Integrating Gender Equality and Diversity in Innovation Systems (by Luleå University of Technology)	Process leaders or leadership en- thusiasts, educators and facilitators looking for ways of tackling gender equality and diversity in their projects	This toolkit provides different simple methods and interactive, partici- patory initiatives with the purpose of fostering consideration towards gender equality and diversity matters. It presents three phases- 'identify' (understanding the issues within system structures, in regards to norms, values and so on), 'share' (focusing on knowledge sharing among sys- tem stakeholders) and 'genovate' (actionable steps towards behavioural or process change)
Toolkit for Gender-Sensitive Placemaking - Improving The Safety Of Women And Girls On Public Transport (by TramLab)	Victoria State Government, the local public transportation service providers and relevant lawmakers	This toolkit provides a comprehensive strategy for fostering inclusivity and equity within public spaces and transport. The document is grounded in evidence-based research and provides general recommendations, as well as tactics and procedures for tackling the obstacles associated with enhancing the gender sensitivity of public spaces. Additionally, it offers references to supplementary materials that may be beneficial to individu- als who are interested in this subject matter.
<b>EQT Gender Equality Toolkit</b> (by IKEM and Ellery Studio)	Working females and other people that aim to raise awareness about gender equality in workplaces	This toolkit consists of 100 cards, a factual booklet and an infographic poster commemorating women's milestones throughout history. It aims to help individuals spot and address sexist behaviour in the workplace. The card deck has 50 situation cards describing workplace problematic scenarios that perpetuate discrimination based on gender, and 50 response cards, providing a variety of practical reactions.

The Gender Equity Toolkit (by the City Hub and Network for Gender Equity (CHANGE))The six cities, co-founders of Hub and Network for Gend Equity: Barcelona, Freetown London, Los Angeles, Mexic and Tokyo		This toolkit takes a gender perspective, in the context of creating equal communities and gender equality in the city space. The report is divided into four sections, corresponding to different archetypes attributed to the city, in the context of innovation, workplaces, policies and partici- pation. Each of these four chapters is concluded with an open reflection question.
Gender Lens in the design of services - Facilitators Guide (by Sensitive Service Design)	Service designers, design leaders, interdisciplinary teams that aim to incorporate a gender perspective in their routine professional activities	The objective of this guide is to provide assistance to service designers in conducting a gender-focused workshop. The workshop is intended to serve as a platform for participants to engage in high-level reflection and comments on the subject of gender within the framework of current service design trends and practices.



Figure 31. Images from the reviewed resources and tools

#### 8.3.2 Review findings

Upon reviewing existing resources that tackle gender sensitivity or gender equality, it is evident that the majority of them do not specifically target designers who wish to incorporate a gender lens in their design projects. Instead, their target audiences range from governments and public service workers to educators, activists, scientists, or policy makers. As these target audiences are diverse, the tools and toolkits generally aim to increase awareness about gender differences and promote best practices. This may include learning about specific terminology, avoiding assumptions about someone's gender, and choosing neutral and respectful language.

#### 8.3.2.1. The importance of terminology

Some of the resources (e.g., Gendered Innovations) differentiate important terms such as gender and sex from the outset. This is done through key definitions, defining principles or recommendations to consult the existing research. On the other hand, some toolkits (e.g., Gender and Recycling) introduce new terminology used mainly in the toolkit's context, such as the non-gendered term 'recycler'. This shows that no matter what the outcome of this thesis project will be, our solution could benefit from including a set of definitions and terminology that the target audience (i.e., service designers) can use to align on and build a shared understanding given that both gender equality and circularity are complex and wicked problems (as highlighted by Eden & Wagstaff, 2021; Padila-Rivera et al., 2020 or Küçüksayraç et al., 2015)

#### 8.3.2.2. The risk of loose documentation

Besides each resource and toolkit providing specific best practices to their target groups, most also include applying the technique of reflection over open questions or engaging in team discussions. While some reflexive activities can be encouraged through individual forms of assessment (e.g. self-evaluation or quiz), most activities tend to be collaborative or include participatory methods that engage multiple stakeholders in discussing and reflecting on

the topic, as well as ideating new strategies and actionable steps for change. However, many resources and tools did not support the participants in structuring or documenting their collaborative sessions. This made us question whether such tools are too open and might risk being inefficient in supporting service designers throughout their process. The activities that proved to be more structured included actionable strategies, templates, and checklists with either questions to consider or specific steps to go through to reach a desired outcome.

#### 8.3.2.3. Embracing intersectionality

Finally, while the central focus of the tools was gender, every reviewed resource mentioned the importance of recognizing how gender interacts with other social dimensions and factors, such as poverty, crime, age, ethnicity, and education. To address such a multifaceted and overwhelming topic, some of the best practices recommended (e.g. in the resource provided by the Scottish Government and in TramLab's toolkit for gender-sensitive placemaking) including conscientious data collection and continuous activities to raise awareness. For example, public service workers and researchers can take concrete actions by using gender segregation in their research as well as obtaining other relevant data or initiating dialogues with key stakeholders on these pressing challenges.

#### 8.3.3 Inspiration for further ideation

Upon reviewing the toolkits, we discussed the activities and elements we found most comprehensible and relevant, given our knowledge of the design process and the challenges service designers shared during the expert interviews. As a result, we found two formats that we deemed particularly helpful and feasible - namely, define activities and the use of conversation cards.

#### 8.3.3.1 Defined activities

We used the term 'Define activities' to refer to the structured and nearly step-by-step guidance used in resources like The GenderWorks toolkit (by Oxfam). In Oxfam's toolkit, each activity (e.g., Exploring discrimination or Power and influence) is presented in a clear layout and structure, starting with its purpose and needed resources (e.g., materials like post-its or flipchart) to step-by-step guide concluded with a case study. Furthermore, some activities also provide tips for relevant questions and examples of filled-out templates. Furthermore, some activities also provide tips for relevant questions and examples of filled-out templates. Finally, the toolkit also provides a series of cards with tips on how to build support, get the message across, or stay focused on the challenge.

The inspiration we took for our next ideation was the holistic approach of the toolkit. In other words, each activity provided not only information on why a particular issue was important but also practical guidance and examples.

#### 8.3.3.2 Conversation cards

The use of various cards to drive discussions, ideate, or imagine new solutions is nothing new in service design. In fact, a quick Google search reveals dozens of design toolkits turned into and accompanied by visually pleasing decks of cards. However, cards are not only popular for their looks but have also proved to be beneficial and easily applicable in workshop sessions (Hildén et al., 2017) and in supporting ideation among participants (Lucero & Arrasvuori, 2010). A study by Athvankar et al. (2014) lists further benefits of using cards in the design process, like informing participants, providing a shared design language and, lastly, making the process more tangible and visual for everyone. As participants can refer back to cards when structuring and communicating their ideas, the cards can sometimes spark new ideas and be used for different purposes than they were initially intended (Athvankar et al., 2014). Finally, depending on the content of the cards, they can even communicate theoretical knowledge and research insights in a more accessible and comprehensible manner (Bekker & Antle, 2011).

Among the reviewed resources and toolkits, several used a card-like format. However, we found the most interesting to be the EQT Gender Equality Toolkit developed (by IKEM and Ellery Studio) and Gender Lens in the design of services (by Sensitive Service Design). Besides being developed through an iterative design process, the toolkits apply a gamified approach to tackle the complex topic of gender inequality and use visualisations to facilitate difficult conversations. Furthermore, they also raise awareness towards facts that might not have been known by everyone. Therefore, we decided to investigate whether the card format would be relevant and meaningful to explore in our next ideation steps.

## **REFLECTION**

Even though service designers have a wide toolbox with various methods and tools to choose from, there is, to our best knowledge, only one recently developed service design tool targeting specifically gender as a social factor (Gender Lens in the Design of Services by Sensitive Design) and no tools considering its intersection with consumption. Given that service design is a user-centric practice, the lack of gender perspective and gendersensitive design tools is problematic. It might reinforce the barriers to starting conversations about gender differences but also adds to the mantra that 'designing with the user in mind' inherently means designing with gender needs in mind. Therefore, this gendered resource review helped us in two ways. First, it inspired us to study how others designed materials to help different target groups become aware and actively work with gender sensitivity in mind. However, it also reinforced our motivation and made us reflect on how projects like ours might help the service design community in becoming more inclusive and start initiating discussions around sensitive and politically challenging topics like gender. Lastly, we reflected on the tendency among the reviewed resources and tools to prioritise alignment, discovery, and reflections. While these are important and valuable for individual and collective learning experiences, we discussed the importance of the tools to drive more actionable change, especially for designers, instead of only fueling the change process through facilitation and knowledge sharing.

#### 8.3.4 Conclusion and next steps

The review of existing resources and tools helped us understand how others approach the topic of gender when aiming to raise awareness, tackle gender biases, or make gender-sensitive thinking actionable. Now, it is important to realise that only a few of the reviewed materials focused on designers, while the majority aimed at various professions like policymakers, educators, or even healthcare professionals. Therefore, we had to focus our next steps on discovering the needs and expectations service designs have toward a desirable and feasible gendersensitive design tool. To find out, we decided to conduct more expert interviews.

#### **8.4 Expert interviews**

In our third series of expert interviews, we followed the same planning and scheduling process as previously (e.g., contacting possible participants via LinkedIn or email). However, with each interview being limited to 30 minutes, we made a deliberate decision to specifically recruit three particular types of service designers. These included those with whom we had previously talked and who were already familiar with our project, those we knew personally, and those who had a history of working or were interested in gender topics. However, this also meant that only one expert (E3) was working with a circular economy at the time of our interviews.

We successfully recruited four practitioners who are currently residing and working in three European countries, namely Denmark, Belgium, and the United Kingdom (Table 12). All participants opted for a digital meeting via Microsoft Teams, which was transcribed with their consent using the native Microsoft Teams transcribe function. In line with our previous expert interviews, all experts were advised not to disclose any project- or company-specific information that they would not feel comfortable or safe sharing.

Table	12. An	overview	of the	recruited	service	designers	and	other	design	experts
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#ID	Background information	Gender	Interview format
E3	Service Design Leader for Circularity in a large international company (Netherlands)	Woman	Digital
	<u>About the expert:</u> This expert has over 20 years of experience in design research, UX, UX training, facilitation and service design. Their current role focuses on improving a circular service offering of their organisation and on improving the digital experience for all the stakeholders involved.		

E11	Social designer and researcher in a design studio (Great Britain)	Man	Digital
	<u>About this expert:</u> This expert has an educational background in industrial design and global prosperity. E11 advocates for inclusion and sustainability and currently works as a junior service designer in a strategic customer experience agency.		
E13 Service designer and researcher in a design studio (Denmark)		Woman	Digital
	<u>About this expert:</u> This expert has prior experience in communication, UX, CX and re- search and currently works as a consultant service designer for the public healthcare system of a European country.		
E14	CXO (Chief Experience Officer) in a design agency (Denmark)	Woman	Digital
	<u>About this expert:</u> This expert runs the experience design department of a Danish de- sign agency, managing over 20 UX and UI designers. E14 leverages design to attract collaborators and partners and to promote the value of digital experiences.		

#### 8.4.1 Interview structure

As mentioned above, every interview lasted 30 minutes, and we interviewed each expert separately. Compared to the previous interviews, we used a more loose discussion guide, as some participants were already familiar with our project and needed a shorter introduction to its theme (Appendix 11). Furthermore, we still included an opening section allowing experts to reflect on the topic and share their insights. After that, we inquired about their thoughts regarding developing our gender-sensitivity design tool. Therefore, the focus on the expert interview can be summed in the following those research questions:

- How do the experts experience gender differences and possible inequalities during their work as designers, and more specifically service designers.
- What are experts' needs and wishes for a design tool addressing gender differences in circular consumption? When and how would they use such a tool?

#### 8.4.2 Findings

Although the expert interviews aimed primarily at gaining insights needed for developing our concept, they also provided additional perspectives on the role of designers in their organisations and their reasoning about gender and circularity. The findings confirmed what we assumed based on the resources and tools analysis (8.3), namely that service designers do not currently have enough guidance, both in terms of knowledge and methods, to always engage with a gender perspective in their projects. Furthermore, external factors such as project budgets, allocated time, or support from their managers played a role in whether or not they could include more focus on gender segmentation in their research or ideation.

The following sections will briefly detail some of the main themes collected during the interview analysis. As the topic sparked similar reactions as in our previous expert sessions, we also briefly commented on several of the same topics as those the readers saw in the expert interview analysis in the Define phase (e.g., reflections on the challenges of lifting a gender perspective).

#### 8.4.2.1. The gender reality of design teams

Given that all participants worked in design consultancies or were employed in in-house design teams, they would often begin by reflecting on their experiences from their workplaces. These reflections ranged from sharing details about their teams in terms of gender representation to pointing out gender inequalities among management. For example, E3 mentioned that her team works closely with engineers who are primarily men and are generally less interested in circularity. She recalled a situation when, during a workshop, everyone would rate how passionate or indifferent they were about circularity, resulting in many women identifying themselves as activists. A strong interest in sustainability was also expressed by E13, who, despite that, admitted feeling intimidated to contribute to her company's sustainability slack channel as men dominated the conversations.

Experiences like these further confirmed our findings from the Define chapter, namely that the lived experiences of gender cannot be entirely separated from their work identities as the boundaries of where a personal self stops and the professional self begins are blurry.

"I have a design team, but we also work very closely with developers, and that is very gendered [..] The design team is mostly all women, and [..] developers are almost 100% men [..] I think that in our design team, we would be much more open to having more open conversations than with developers." (E13)

"We did this workshop once where we had this line on the floor. Are you more of an activist, or more like you do not care so much about the topic (note: circularity)? And it was me and a lot of women on the activist side. So that is just an interesting pattern. And when I think about my team and the people most interested in bringing the topic of circularity forward, they are indeed more women." (E3)

#### 8.4.2.2. Current ways of including a gender perspective

Another theme included insights on how service designers and their teams currently incorporate gender perspectives in their projects. Here, the experts differed in evaluating how familiar they were with gender topics. For example, while E11 shared the experience of writing his thesis on gender inequality, E13 admitted being unsure about her ability to navigate the topic and even recognise instances of gender inequality. She then mentioned that her company provides yearly training for the employees. The training consists of short videos and testing covering many other subjects besides gender inequality, for example, the strategies to maintain a good posture while sitting.

> "I am not really an expert on gender [...], and there is this kind of barrier to talking about gender. It would require becoming very sensitive to what gender means [..] Because it then mixes with sexual orientation and so on [..] I do not even know how to introduce it (note: refers to gender perspective). It just feels very hard to separate and to be objective and to not just sound like I am coming from my own experience" (E13)

> "I think we try to consider a bit of balance in terms of gender and the participants we talk to and interview. But I do not think we do a proper gender analysis." (E11)

Furthermore, the experts admitted that they do not usually consider gender as being an influential factor, although they gradually recognized why it might be important. Moreover, the reasons behind the lack of gender perspective were often linked to situations outside their control. For example, E13 mentioned that the lack of financial resources for participant recruitment forces her to look for them on social media platforms like LinkedIn. In addition, as she works on a service for innovators, applying a gender lens is difficult as most innovators are men.

Similarly, E3 mentioned institutional barriers that come from her team being involved in a late stage of the design process as opposed to the innovation team, who, as E3 assumed, would pay more attention to gender. However, as she kept reflecting, she realised that their current separation of target users (i.e., those having or not having access to a car) is too narrow. Thinking about her private life, she realised that women and men could be involved differently in engaging with a buy-back service. For instance, women might take the initiative to bring the product back to the company but would likely rely on men as some products were large and heavy. Despite this moment of reflection, she was quick to dismiss the gender perspective again, as the team's focus is currently on designing the fundament of the service. Looking back, we reflected on several dissonances like these. First, we discussed how the lacking figures of female innovation services. Similarly, E13's view on gender as something that can be down-prioritised as the development team's focus is on establishing the foundation of a customer-centred buy-back system supports not only our findings about the missing gender but also the lacking social dimension of circular services.

"At the moment, we do not have a budget for research. So, all the research we are doing is with volunteers [..] also people who sign up for conferences and [...] If I had a budget, I would love to do better screening [..], but at the moment, I basically have a philosophy that I am lucky with whoever signs up, and that is whom we are going to test [..] However, that ends up being mostly men." (E13 on testing for her project with healthcare innovation) "To be honest, I have not thought of doing that split (note: gender stratification) for our buy-back service [..]. We are looking at people with and without cars. So that is the split, but that is not a gender split, right? [..] I'm thinking that we should think about this more, to be honest. But we are laying the foundations for the whole thing (note: the system), so [..] if I would bring it up now, people would be like: it could be interesting, but let's put it on the bottom of the list." (E3)

Finally, E4 mentioned that aiming for equal gender representation might not be the most viable solution when designing services aimed directly at women. In other words, if a service is framed as being for women, designers might not consider spending budgets on recruiting men. This perspective is interesting as it calls for a definition of 'service aimed at women'. Furthermore, it assumes that services like these (i.e., aimed at women) are performed in a vacuum without men's involvement. Yet, that might not always be the case. For example, we reflected on the gendered example provided in the Define phase by E7, who, during our interview, mentioned that men's public bathrooms are often discriminatory as they do not contain an area for men to change diapers on their babies. Cases like these show that stereotypical views on what is used by women and men need to be analysed before the men's involvement, and therefore user research into their needs can be ruled out.

"I do not think equal gender representation is necessarily the right starting point. Depends on what your point is. [..] If you know that there is a thing with men and women, then you need to split on genders and have them represented, but it is not always. If I make a system for the target group of women, then I should not include gender and should not necessarily include men." (E14)

#### 8.4.2.3. Input for the tool

The final group of insights contains the expert's input on the different qualities and needs our tool should meet and cover. During the interviews, we began this short ideation activity by introducing our idea of creating a tool for practitioners like themselves. Then, we introduced the results of our resources and tools analysis (8.3), which confirmed the lack of service design tools focused on including a gender perspective in contexts like circularity. Then, we invited the experts to brainstorm and share with us any inputs they might have.

First, E13 and E11 both mentioned the need for self-assessment and understanding of one's own biases and privileges. For example, E13 noted having tried a positionality tool but quickly added that she would not feel comfortable sharing too many details, such as her income, with her design team. Next, most experts highlighted the importance of gender-segregated data collection and analysis. Furthermore, at least two talked about the importance of awareness among the members of their team but also other stakeholders. However, as the topic could be sensitive or difficult to discuss, they suggested raising awareness in an accessible, open, and non-threatening manner. This is also important, given that the teams are often gendered, as mentioned by E3.

"I think research is really important [..] having a sound research process that is well informed and is trying as hard as possible to get as many voices in and not just, when we are talking about gender, not just women." (E13)

"Creating awareness [..] it would be helpful if you had some arguments like why we should think about it [..] Maybe a set of slides that you could use at the beginning of a workshop with [..] data overview to make people aware [..] and then examples are always good from other companies." (E3)

"It would of course depend on where you are in the process [..] At the earliest stage when you are looking at your analysis of systems [..] maybe you need to understand the existing gender impacts of the status quo [..] So, the analysis and then the interviewing stage of obviously getting diverse voices." (E11)

Overall, the interview provided us with valuable input and helped us better understand the different tensions service designers might face and which we must consider during development of our solution. With that in mind, we moved to the next step.

#### 8.5 Design reflections and initial principles

Based on the insights gathered from the expert interviews, we were confident that we have collected sufficient input to develop initial design principles that will guide the creation of our concept ideas. In order to refresh readers' memory on the key findings from the Develop phase, we have included a brief summary in Table 13.

#### Table 13. Overview of the key findings from the Develop phase

#### Findings from internal brainwriting sessions (8.2)

We identified three clusters representing possible thesis outcomes. The clusters were created around ideas on how the gender-sensitive tool for circular consumption could support service designers either through knowledge or input to a specific design phase.

Clusters: Compiling best practices, Assistance during the process, and Invitation to reflect

#### Findings from the resources and tools analysis (8.3)

The analysis confirmed the lack of service design tools that could support service designers in working with a gender perspective in the context of circular consumption. The inspiration from the analysis was the idea of using defined activities to support service designers in navigating the complex topic and the popular format of conversation cards which could make the gender discussions more playful and accessible.

#### Findings from the expert interviews (8.4)

The expert interviews confirmed the varying level of awareness and confidence in raising and applying a gender perspective during the service design process. Therefore, based on the experts' input, the tool should focus on uncovering biases, raising awareness, promoting gender-agnostic or gender-less research, allowing non-judgemental and safe within-team and across-team conversations, and finally, examples and evidence for the claims about gendered circular consumption.

#### 8.5.1. Design reflections

Now, prior to creating the first sets of principles, we conducted an internal session called 'Design reflections' to ensure that we were aligned. We used the reflections to pause and bring to the table any challenges or concerns we had about the project and its focus. For example, we discussed the practicalities of integrating gender perspective in circular consumption through design - a combination of skills and experience none of our experts said they were having. We also wondered about the workflow, the pressing budgets, and lack of time everybody kept mentioning. To capture thoughts like these, we ran the design reflections session as a series of curious inquiries that were pertinent to the matter at hand. These inquiries had the potential to influence the trajectory of the tool. Upon writing them down, we proceeded to address them through deliberation. However, it is important to note that as we collected over fifteen of such inquiries, we will only introduce three examples of them.

#### Design reflection:

#### Who is eligible for support in increasing gender sensitivity on circular consumption projects?

The eligible candidates for receiving support in increasing gender sensitivity on circular consumption projects could be service designers who work directly on projects tackling circular consumption and sustainability and service designers interested in strengthening their circular consumption and broader circular economy knowledge and skills. Furthermore, the tool could support service designers transitioning to working with a more circular mindset or those advocating for it. While these answers provide the opportunity of enriching one's understanding of gender in the context of circular consumption (and even circular economy), we agreed to explore ways the thesis output could bring awareness to each of the two topics (i.e., gender and circular consumption) individually, as well as find a way to work within their overlap.

#### **Design reflection**:

#### How could the thesis outcome be used in real-world settings, transferring academic knowledge in a practitioner's reality?

To answer these questions, we had to first define what we meant by real-world settings. Therefore, we began by listing different team situations we heard about from the experts or experienced ourselves. For example, we noted that services might work in-house as solo designers, within a design team, or in a cross-disciplinary team (e.g., in a team with developers). Next, we listed designers working in consultancies and noted that some might work alone while others work in groups with other design consultants. Either way, as consultants, they would likely be hired to collaborate with their client's cross-disciplinary teams (e.g., business developers). Furthermore, we added freelancers, service designers working in agencies or public services and NGOs. Finally, we listed service designers in research and academia, including service design students.Looking at this overview, we realised that each of these represents a certain 'design reality' shaped by different processes, know-how, norms, actors, and professional identities. Furthermore, these would change if we were to apply a lens of a specific industry or country. Therefore, for the thesis outcome to be applicable in real-world settings, it needs to allow designers to project their realities into it, which is no small challenge.

Next, we looked at the various constellations and involvement types that service designers tend to engage in. We identified that designers could act as stakeholders in end-to-end processes, participate in specific project phases, or provide targeted assistance within a particular area. Following the expert interviews, we observed that there were primarily two types of involvement among the designers we interviewed. Firstly, many were engaged in specific project phases, such as research or product development stages like developing and testing. Secondly, some designers and consultants were invited to provide input in a specific area, like user-centred circularity, which resulted in their connection to the overall project being episodic and brief. Finally, we reflected that only some of the designers we spoke with were typically involved in the type of end-to-end project that we were trained to execute in our master's studies. Reflecting on the realities of designers' involvement, we discussed that the tool could not be aimed at an entire design process or a single design phase. Instead, we decide to focus on the initial stages of designers' work when designers plan their activities (regardless of their involvement) and can critically review the client or project briefs. Nonetheless, we also realised that the tool could only do as much, no matter how fitting it is, and that the influence and power of service designers or their design responsibilities will always vary depending on the project, institution and company size. All these elements can influence the nature of the design process, as well as the methods and tools used to reach the project objective, regardless of its timeline.

#### **Design reflection**:

#### If we include gender sensitivity within a circular consumption project, how will the impact be measured?

The challenge of measuring impact was raised by the survey respondents in the Project context chapter (chapter 3) and is also highlighted in the recent report by Design Council (2022). Furthermore, Björklund et al. (2018) argue that impact assessment within service design can be complex due to the variety of the previously mentioned types of involvement of designers but also the varying contexts companies have (e.g. maturity, resources, process, strategy). Similarly, Penin (2018) states that service designers currently do not have specific tools to assess the environmental impact of their solutions and must therefore borrow tools (e.g., Life-cycle assessment) from other disciplines. Needless to say, such tools are usually complex, and training in using them is typically not part of service design study programs or commercial courses. However, despite these challenges, impact assessment remains an important topic in service design, and it is gradually becoming more common as a part of evaluation processes for all sectors (Forss et al., 2011; Foglieni, Villari & Maffei, 2018).

In the context of gender, the European Institute for Gender Equality (2016) recommends applying various implementation, monitoring and evaluation methods to ensure gender equality of policies. When advising on how to perform social impact assessment, the suggested questions targeting gender are:

- "Does the option have a different impact on women and men?
- "Does the option promote equality between women and men?"
- "Does a law, policy or programme reduce, maintain or increase the gender inequalities between women and men?" (European Institute for Gender Equality, 2016, p 8).

Reviewing these considerations, we discussed that we had initially thought about impact as something that is quantifiable and inherently measurable in numbers. However, while circular consumption projects can, and should, involve such assessment (e.g., a number of men and women using a service), the process of reflection can also contain notions of impact as it can track a design team's progressive awareness or maturity and inclusiveness of their research and design approach. With this in mind, we moved to draft the set of initial design principles.

#### 8.5.2. Initial design principles

After exploring various design reflections and ensuring an internal alignment, we continued by brainstorming and writing down initial design principles. According to Holmlid and Wetter-Edman (2021), design principles refer to a collection of characteristics and qualities that a well-designed service should possess. Design principles are typically based on research findings as well as general heuristics for good design, such as user-friendliness and ease of use. By establishing and promoting design principles, design teams can concentrate their efforts on developing well-rounded and informed solutions. Furthermore, they can utilise design principles are based on research findings as well as general heuristics for good design principles as key benchmarks when evaluating concept ideas and prototypes. It should be noted that design principles are based on research findings as well as general heuristics in our design process, we decided to list only the principles related specifically to the principles related to the content, structure, and purpose of the tool (Table 14).

Table 14. Overview of the initial design principles

#### **0. ACTIVE REFLECTION**

The principle of active reflection is fundamental to the tool. Besides critically reflecting on the role of gender in a particular circular consumption project, it promotes a conscious process of service designers reflecting on their role in the project, within their team and organisations, in relation to the project limitations and resources, and on the social and environmental impacts of their choices. For example, service designers should reflect on how their design translates into circular consumption opportunities, what practices and roles it stimulates, and what data is used in research and evaluation.

#### **1. AWARENESS OF GENDER BIAS AND INEQUALITIES**

Service designers cannot address the issues they are unaware of or have not recognized. Therefore, the tool must raise awareness about gender differences and risks for inequalities in consumption while allowing service designers to acknowledge their own gender biases.

#### 2. ACTION TOWARD GENDER SENSITIVITY AND EQUALITY

To harness the potential of service designers as agents of change, it is crucial that the tool goes beyond mere awareness and facilitates tangible action. To achieve this, the tools must be designed in a way that enables service designers to seamlessly integrate them into their existing processes while also lowering the entry barrier to engaging with the important issue of gender.

#### **3. DESIGN FOR LIFE SITUATIONS**

As service designers start to enter the field of circular economy, they begin to focus on time. From designing services for prolonged use to crafting journeys of multiple-use cycles, service designers should not lose sight of consumption as a complex life domain. Therefore, the tool should remind service designers to practise sensitivity towards how consumption changes over time and what it implies for their design and understanding of gender.

#### 4. MINDFUL AND SEGREGATED DATA

Good design starts with having access to meaningful and segregated data. This principle requires service designers to pay attention to what data is collected and how that influences the patterns they see in their analysis.

#### 5. IMPACT

Service designers must engage in discussions about the social and environmental impact of their solutions. Therefore, the tool should provide information on how service designers could measure the impact of using it, either within their teams or in a project context.

#### 6. INTERSECTIONALITY

Finally, service designers must recognize that taking a gendered perspective is only one aspect of designing inclusive and equitable services. While the tool makes them aware of the role of gender, they must always consider other social factors as well (such as race, ethnicity, class, and ability), as they all play a significant role in shaping the lived experiences of the target users.

#### 8.6 Concept idea development

As we settled on the initial list of design principles, we began developing our concept idea. From the previous activities in the Develop phase, we knew that we focused on developing a structured card-like tool for raising gender sensitivity among service designers working or planning to work with circular consumption projects. Although we believed the tool could be relevant to other design and non-design professionals, we focused on service designers only, given the short timeline of our thesis project and limited resources to the other practitioner groups. Furthermore, we delimited the application of the tool to the very beginning of the design process. Besides this being motivated by the different types of service design involvement (described in our design reflections above), we got inspired by Carolina Perez's recent publication called 'Invisible Women', highlighting the importance of designers having a solid and informed project start. In our case, this translates into being aware of projects' limitations and biases - and reacting accordingly (e.g. planning gender-segregated research by paying more attention to user recruitment and gender distribution).

Perez starts her influential book, with a very eye-opening analogy, respectively:

"[...] a world increasingly reliant on and in thrall to data. Big Data. Which in turn is panned for Big Truths by Big Algorithms, using Big Computers. But when your big data is corrupted by big silences, the truths you get are half-truths, at best." (Perez, 2019, p 12)

#### 8.6.1 'The three pillars' concept idea

We named the concept idea 'The three pillars' as it consisted of three parts, namely Bias Awareness, Designing circular consumption, and Gender Sensitive Design Plan (see Figure 32) Furthermore, we choose the name to express the tools' relevance for sustainable service design by making a semantic connection to the well-known three dimensions of sustainability (social, environmental, and economic).

Given the different working styles of service designers, we proposed that the tool should be easy-to-use and timeefficient. Furthermore, it should be possible for designers to use it both in a team and individually. Finally, tools should be accompanied by an information booklet to explain key concepts (e.g., gender, sex, circular consumption) and enable participation despite designers not having education in gender and consumption studies. Although we envisioned that the three pillars (i.e., three groups of activities) could be used separately, there is a natural progression for the tool, starting from bias awareness to preparing a design plan.

## **TOOL:**

## 1. Bias Awareness

- Identifying/Testing own biases (in relation to gender in sustainability)
- **Positioning** (recommended activity to understand what drives worldview)
- Project bias

### 2. Designing Circular Consumption

This section will focus on **selected circular practices**, including dimensions like:

- Values and meanings
- Resources and access
- Practices and role
- Norms and social structure
- Economic resources and time

## 3. Gender Sensitive Design Plan

This section will support designers in findings concrete steps for **taking action.** Some areas we expect this part can cover are:

- User involvement
- Stakeholder management
- Cross-collaboration communication strategies

Figure 32. Overview of 'The tree pillars' concept idea.

#### 8.6.1.1 Bias awareness

The first group of activities had the primary objective of raising awareness among service designers about possible gender biases and stereotypes that they, their teams, and their projects may hold. First, the designers could consult the envisioned booklet that would accompany the tool and provide information on gender in consumer research and introduce the key concepts. Additionally, we created drafts of Provocation cards that presented research findings in a provoking manner and intentionally stereotyping manner<sup>7</sup> (e.g., using phrases like 'all woman') (as seen in Figure 33). By engaging in discussions and reflections, the Provocation cards were assumed to help service designers identify their gender biases when reasoning about circular consumption. Furthermore, designers could use the same cards to review their project brief, asking whether it assumes certain behaviour and attitudes on behalf of women and men.

Finally, we also included a positionality exercise, as it was mentioned by our interviewed experts. We envision that this can take the form of a discussion or a brainwriting session.

All women tend to be more selfless and caring, even in the context of sustainability issues. But does that make it ok for designers to assign more labour to them?	Women are more materialistic and bigger consumers than men. So shouldn't they care more?	Gender plays a big role in determining how we consume.
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Figure 33. Examples of the 'Provocation' cards.

#### 8.6.1.2 Designing circular consumption

The second pillar was intended to drive discussions on design for circular consumption, keeping the gender perspective in mind. Here, the idea was to create a card deck with each card representing a circular consumption practice. We called the deck Practice cards (Figure 34). On top of each card, we included the measurement of impact inspired by the hierarchical structure for value retention in the Rs frameworks (e.g., Reike et al., 2018) On the back of each card, designers could read more about each practice.



Figure 34. Examples of Practice cards

<sup>7</sup> Our inspiration for adopting a provocative tone of voice came from one of the interviewed service designers (E7) who had previously researched the impact of gender biases in design. According to E7, she chose to utilise speculative and critical design methods to overcome the initial indifference and distrust she encountered when presenting her findings to design students.

Next, inspired by the Practice theory (e.g., Shove et al., 2012), we created a list of short questions service designers could ask themselves when discussing the practice. The questions were the following:

- How might gender impact the values and meanings of this practice?
- How might gender impact who has resources and access to this practice?
- How might gender affect doing this practice?
- How might gender affect norms and social structures associated with the practice?
- How might gender impact who has the economic resources and time to do this practice?

#### 8.6.1.3 Gender sensitive design plan

The outcomes of discussions and reflections on the Practice cards culminated in making a gender-sensitive design plan. Here, the template (Figure 35) was simple and invited designers to use Post-Its or write directly on the template their ideas on designing in a gender-sensitive manner.



Figure 35. Template for entering concrete activities to design in a gender-sensitive manner.

#### 8.7 Expert feedback

As we created the concept idea and began prototyping its key elements (e.g., Provocation and Practice cards), we decided to conclude the Develop phase with expert feedback on our concept. We reached out to the previously interviewed designers (E2 and E5), who agreed to spend 30 to 45 minutes providing feedback on the initial sets of principles and 'The three pillars' concept idea. Additionally, E2 was joined by a colleague (E10) who previously worked on projects involving topics of gender equality and stereotypes. As all meetings were held via Microsoft Teams, we were able to use our Miro boards and document feedback in real time.

#ID	Background information	Gender	Interview format	
E2	Designer and Partner in a design studio (Belgium)	Woman	Digital	
	(previously introduced) About the expert: This expert has previously worked on circular economy projects and is also involved in various social innovation projects. Furthermore, E2 teaches and applies methods of system design.			
E5	Ph.D. Researcher at AAU (Denmark)	Woman	Digital	
	About this expert: This expert has prior experience in UX design, industrial research and service design. E5 is currently conducting research for a European project in the context of sustainable and circular urban spaces.			
E10	User researcher, Service Designer and UX Designer in a design studio (Belgium)	Woman	Digital	
	About this expert: This expert is formally trained as an industrial designer and further leveraged the curiosity for user understanding into a user-centric career. E10 has previously been directly involved in two projects targeting gender equality, gender stereotypes and other sensitive topics.			

Table 15. Overview of the recruited service designers and other design experts

Our structure for the feedback session was divided into two parts. Firstly, we invited the experts to critique, add, or remove any design principles they deemed irrelevant. Secondly, we introduced the concept idea and highlighted its intended use (i.e., alone or in a team) and target audience (i.e., service designers). We also walked the experts through the tool, presenting its structures, expected activities, and outcomes.

#### 8.7.1 Findings

While the feedback session was largely constructive and positive, it also proved to be somewhat challenging and frustrating at times, as we realised that the tools took a significant time to explain. As a result, the experts were occasionally unsure about the different parts and asked follow-up questions that made us realise they did not fully understand how the principles and the tools would interact. In retrospect, we could have made the presentation less text-heavy, as we observed that the participants were reading while listening to us. Additionally, we could have clarified the objectives of the principles and their influence on the tool and its three pillars.

That being said, E2 and E10 were generally supportive of the principles, but recommended that we remove principle number 2 (Action toward gender sensitivity and equality), 5 (Impact), and 6 (Intersectionality), as they viewed the tool primarily as a means of creating awareness and providing information. They further stated that they would use their own tools and methods to translate awareness into action. They also proposed changing the principle labelled as zero from Active reflection to Empathy and Care. They explained that reflection is too broad, and in the context of sustainability, the goal should be to increase people's concern for the environment and for each other. Finally, they proposed the addition of a new principle called Understanding the Roots, which they considered necessary for taking a more systemic approach to understanding gendered consumption. As for E5, she understood the principles as a form of a manifesto but did not provide specific feedback as she saw them as too broad to comment on. This made us realise that if we are to share these in the final product, their explanation must be more concrete. In evaluating the Provocation and Practice cards, it became apparent that providing feedback was simpler because of their more tangible and concrete nature. Expert E2 and E10 expressed a positive impression of the card format, but raised concerns about the provocative tone of the voice. This was viewed as potentially problematic, as it could be perceived as lacking in seriousness. E5 further elaborated that seeing the cards for the first time helped her understand the tool better. She also highlighted that the cards provide possibilities to discuss and understand biases in a different and more fun way. Finally, she proposed that instead of assuming and accusing designers of biases, the tool could invite them to explore the different challenges in their projects and discover biases along the way. For that, the checklist for Practice Cards was perceived as helpful but too academic.

"This is interesting because it makes it more concrete in a way. Women are more materialistic and bigger consumers than men, so shouldn't they care more? (note: E5 reads a provocation card) OK. But then you can kind of discuss it, I guess, right? [..] Now, I think I better understand what you mean by bias [..] So you could almost have it like a game. You could meet in a project, and you throw these cards on the table, right? And you could have people's assumptions being discussed. Now I am getting it more. I understand what you mean." (E5)

Unfortunately, given the limited time, we could not receive feedback on the design plan template. However, reflecting on E2 and E11's claims about using their tools, we realised that we would need to come closer to the planning questions and activities service designers engage in at the beginning of their design process if we were to help designers to turn ideas into action.

#### 8.7.2 Feedback implementation

Following the expert feedback session, we decided to keep the principles which were suggested to be removed. This decision was motivated by reflecting on the findings during the review of resources and outcomes (8.3) based on which we saw the value of actionable ideation in addition to awareness. Next, principle 0 was extended to include the notion of Empathy and Care, and a new principle for Understanding the roots was added. However, it is worth noting that this principle is meant to be aspirational and inspiring for service designers rather than a requirement. The multidisciplinary concepts of gender and consumption are not often explored in service design studies and training, which is why the principle aims to encourage designers to explore and learn more about these concepts. Lastly, the card-like format was well-received, and as a result, we decided to continue developing it in the next chapter.

#### 8.8 Conclusion of the Develop chapter

The Deliver phase is typically for its divergent thinking, allowing us to explore the path toward a possible solution. By combining traditional ideation methods (i.e., brainstorming) with elements of research (i.e., review of resources and tools) and early concept review (i.e., expert interviews), we could better understand how to start turning our concept idea into a more detailed and elaborated concept - this will be the focus on the next, and final, design phase.

# 9. DELIVER

The final design phase, Deliver, focuses on iterating the prototypes, gaining feedback from user testing, and implementing a final solution (Penin, 2018). In practicality, this last converging phase requires designers to move from conceptual sketches to tangible prototypes and materialise the solutions. This process allows designers to present their prototypes to users, learn from the testing sessions, iterate as many times as needed, and identify areas of improvement (Nessler, 2019).

This chapter encompasses the concept development, informed by the findings from the expert interviews conducted in the previous chapter, followed by testing workshops and feedback sessions that facilitated multiple iterations of the prototype before its ultimate finalisation. We will conclude the chapter by presenting the "Circular Gender Lens" toolkit, its key elements, and its intended use. Finally, we will reflect on the development and testing process of the second diamond and outline possible future development of the solution.

This chapter consists of the following sections:

9.1 Introduction
9.2 Concept development
9.3 First testing
9.4 Prototype iteration
9.5. Peer feedback
9.6 Prototype iteration
9.7 Second testing
9.8 Final feedback
9.9. Final concept
9.10 Conclusions from the Deliver chapter

#### 9.1 Introduction

This chapter provides a comprehensive summary of the development and testing process of the "Circular Gender Lens" toolkit. We begin by introducing the initial prototype, which was based on the 'Three pillars' concept discussed in the previous chapter. To allow readers to grasp its structure, we will introduce the different elements of the prototype separately, followed by learnings from their testing. Besides presenting findings from the testing sessions, we will also include feedback provided by several experts whose input helped us refine and finalise the solution. At the end of this chapter, we will present the final solution and describe its key parts.

Similar to the previous two chapters, the sequential arrangement of the carried-out tasks was not as rigorously defined as their linear presentation in the chapter. The non-linear nature of service design (Stickdorn et al., 2018) may have resulted in certain activities overlapping or affecting one another. Lastly, although the solution was primarily developed with the involvement of experts, certain decisions were made with regard to citizens who might be users of the circular services. This is evident in the selection of circular practices, represented by Practice cards, that are relevant to both service designers (i.e., describe types of circular services) and citizens (i.e., describe types of circular consumption practices).

#### 9.2 Concept development

The Deliver chapter begins with positive evaluations of the 'Three pillars' concept idea, which confirmed that the tool's basic structure and card-like format were largely comprehensible and possible to include at the beginning of a typical design process. Therefore, upon receiving confirmation about the feasibility of the tool's basic structure (i.e., its tree pillars), we started to prototype the concept, debating the details of its possible application and developing its key components and activities.

In the following subsections, we will first introduce the high-level structure of the concept, followed by a detailed description of the updated main pillars: 'Bias awareness', 'Gender sensitivity', and ' Designing a gender-sensitive circular service.'

#### 9.2.1 Structure and framing

After several rounds of brainstorming and discussions on how to further structure and develop the tool, we decided to organise it as a step-by-step methodical activity. First, the tool shall be introduced through an accompanying leaflet or manual that greets the practitioner (in our case, a service designer) and explains the tool's main themes - circular consumption and gender. Based on the findings that many service designers feel unsure or even intimidated to engage in gender discussion, the text should contain a simple and accessible glossary introducing concepts like sex, gender, or gender equality. Furthermore, in line with our findings, the tool must summarise the research behind the toolkit to demonstrate the importance of focusing on gender differences in consumption. Moreover, the text should also explain why service designers are well-positioned to explore this area and how fostering gender sensitivity can lead to less biassed and more inclusive design. Lastly, the text will also serve as an introduction to the tool and should provide practical instructions for carrying out the designed card-based activities.

The modular nature of the tool (i.e., three pillars) makes a clear distinction between activities focused on gender awareness and those exploring circular consumption. However, the tools also provide several synergies between the topics, such as when service designers are asked to reflect on the project context and explore how their brief takes into consideration gender differences.

#### 9.2.2 First pillar: Bias awareness

The first pillar focuses on opening a discussion about gender and paying attention to possible gender biases and stereotypes at both individual and project levels. To explore these, the pillar suggests activities aimed at understanding an individual worldview (9.2.2.1 Identity markets), engaging with positionality (9.2.2.2. Positionality cards), and reviewing a project context (9.2.2.3 Project context cards).

#### 9.2.2.1 Identity Markers

As an initial step toward building gender sensitivity, we agreed on designing an exercise that would invite practitioners to engage in self-reflection and consider the various factors that influence their perception of the world. Once they identify their position (e.g., affected by their social context or ethnicity), the exercise could nudge them to reflect on their own biases in relation to gender.

#### What is positionality?

According to the online dictionary, Dictionary.com (n.d., para1), "positionality is the social and political context that creates your identity in terms of race, class, gender, sexuality, and ability status. Positionality also describes how your identity influences, and potentially biases, your understanding of and outlook on the world".

The inspiration behind the positionality exercise came from one of the experts (E13) we interviewed. During the interview, she shared her experience with engaging in the positionality exercise during a workshop. Although she would not feel comfortable discussing all details with her team (e.g., sharing her income), she recognised how her personal experiences and identity could shape her views and interactions with the world. For instance, she realised that as a white woman living in one of the wealthiest countries in the world, she would perceive the world (or certain aspects of it) differently than a woman from a different country whose experience might be shaped by her ethnicity, religion, or socio-economic status. This story reminded us again about the importance of other social factors, beyond gender, that contribute to and shape one's social and political identity. Furthermore, research shows that positionality is a beneficial practice as it helps professionals acknowledge their biases and privileges and can hopefully contribute to mitigating them by improving research data quality and validity (Berger, 2015; Massoud, 2022). By being a typically introspective activity, positionality is especially relevant for projects targeting equity or equality as it encourages deep and critical reflections (Secules et al., 2021).

Therefore, it quickly became evident to us that positionality can be of paramount importance in design projects. This realisation was at the root of our next brainstorming, during which we collected different identity markers, each referring to a particular social or political aspect of identity. We also created two clusters based on how typically some markers are used in user research (Table 16). Similar to our own research, we realised that designers typically include or reflect only on a fraction of identity markets.

<b>Typically collected markers</b> (e.g. in our research)	Other markers influencing positionality
<ul> <li>Age</li> <li>Gender</li> <li>Education</li> <li>Socio-economic status</li> <li>Relationship status</li> <li>Housing status</li> <li>Occupation/profession</li> </ul>	<ul> <li>Body image</li> <li>Mental health</li> <li>Political affiliation</li> <li>Language proficiency</li> <li>Cultural background</li> <li>Sexual orientation</li> <li>Mental abilities/disabilities</li> <li>Religion</li> <li>Ethnicity</li> <li>Geographical location</li> <li>Residency status</li> <li>Physical health</li> <li>Physical abilities/disabilities</li> <li>Occupation/profession</li> <li>Financial literacy</li> <li>Personal interests &amp; hobbies</li> <li>Digital literacy</li> <li>Knowledge &amp; skills</li> <li>Network</li> </ul>

Table 16. Two clusters of identity markers

Following the brainstorming exercise, we began prototyping Identity markers into a deck of cards. Within the deck, each identity marker represented one card on its own (Figure 36- first row).



Figure 36. Sample of Identity marker cards and "fill in your own" identity marker card.

As we intended to stay sensitive towards different working styles and acknowledge our own biases, we reflected on how the identity markers can be a primed reflection of our past experiences. Since we intended to make the cards appropriate and relevant for as many service designers as possible, we decided to add some empty identity marker cards (Figure 36-second row) to the deck, allowing practitioners to extend the deck with additional markers (e.g., relevant to their culture, location, or type of projects). We imagine that this would make the card deck more inclusive, help designers customise the tool to their own needs, and promote creativity and communication across design teams.

#### 9.2.2.2 Bias awareness - Positionality Cards

Although we designed the identity markers to be used on their own, we wanted to further assist service designers in facilitating reflexive conversations or engaging in deeper reflections. Therefore, we created an additional set of Positionality cards (Figure 37) that would allow designers to even better frame their conversation or reflection space. Furthermore, as the positionality exercise might take focus away from debating gender, the positionality cards were intended to help both individuals and groups to stay focused on the topic and return to the original purpose of the session.

Each positionality card depicted an introspective question, intending to invite the tool users to reflect over their own lived experiences and thoughts and share their reflections with their team.



Figure 37. Sample of Positionality cards

All of the questions added in the positionality card deck are presented below, clustered in three categories: 'self-reaction and awareness', 'influence and power', and lastly, 'gender and user perception' (Table 17). However, it is important to note that this division was conceptual, helping us to grasp the different themes and topics the cards should address. Therefore, the actual deck of cards did not differentiate between these categories. Г

Cluster 1: Self-Reflection and Awareness		Cluster 2: Influence and Power		Cl G	luster 3: ender and User Perception
•	How do my own experiences & background shape my worldview?	•	What kind of impact/power/ influence do I have within my organisation?	•	How do I perceive female users in comparison with male users? What about the other way around?
•	Do I ever reinforce (even unintentionally) any (gender) stereotypes?	•	What kind of impact/power/ influence do I have within my team?	•	Do I expect different genders to consume differently?
•	What are my typical experiences/views on gender (in society/in design/in the industry)?	•	How do my (gender) biases affect my design choices?	•	What (gender) bias or stereotypes have I been a victim of?
•	In what contexts did I experience privileges? When did I experience being unprivileged?				
•	What (gender) stereotypes do l notice around me?				
•	What (gender) biases do I have?				
•	Do I ever perceive certain stereotypes or biases as "acceptable"?				

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## REFLECTION

We quickly realised that despite trying to formulate (at least) some neutral, open, general questions, most of these questions have a very personal character. However, their aim is to engage in introspection and self-identification of one's own biases. In addition, biases are characteristic of human nature (Cuella, 2017), so one cannot separate the human or individual self from the designer. That is why we decided to keep all these personal questions and further test them with the tool's potential users to see how they would react to the actual format and focus on personal experiences.
# 9.2.2.3 Bias awareness - Project Context Cards

Finally, as we considered the perspective of those service designers using this tool in a group setting (e.g., within their design team), we decided to add an extra activity to the process of exploring gender basis and introduce Project context cards<sup>1</sup> (Figure 38). The purpose of these was to assist service designers in reflecting on a project brief and evaluating whether it is based on any unconscious biases or assumptions towards the service users. Nonetheless, although we treated this final card deck as important, we also labelled it as optional, given the limited time designers might have.



Figure 38. Sample of Project context cards

All of the questions added in the positionality card deck are presented below (Table 18)

Table 18. Project-related questions used in Project context cards.

# Project context questions:

- How is the project brief priming the design team?
- How are the consumption differences between genders addressed in the project's initial assumptions?
- Does the brief/ project scope reinforce any biases?
- Is it based on any (gender-consumption) assumptions?
- Does the project see any differences between genders needs and consumption patterns?
- Is the project expected to contribute to gender equity?
- Who are the people I work with and what are their (gender) biases?
- How are the different genders impacted by the project's initial assumptions?
- Is the project expected to create equal consumption labour for all genders?

# 9.2.3 Second pillar: Gender sensitivity

The second pillar, named Gender sensitivity, was addressed through a set of cards, called Consumption cards<sup>2</sup> (presented in the following subsections). The purpose of the second pillar was to extend the awareness of personal biases with research findings about gender differences, stereotypes, and possible inequalities in circular consumption.

The Consumption cards (Figure 39), initially referred to as 'provocation cards', were designed to captivate the attention of designers and intrigue them to engage with the deck. The cards aimed to inform designers about the existing research on circular consumption and outline different consumption patterns between genders. Furthermore, some cards presented challenges linked to research and design projects, pointing out that gender inequalities manifest due to social norms and expectations but also due to inequalities in data collection and data analysis. All cards provided information on both the front and backside. On the front, each card presented a thought-provoking

<sup>15</sup> Working title

<sup>2</sup> Working title

statement aiming to engage designers in reflection. The statement was followed by a question, "Intrigued?!", aiming to spark curiosity. The underlying tone of voice for these questions ranged between curious and provocative, as we wanted to test which would resonate more with designers. For example, while some questions simply asked, 'Gender and Sustainability- another woke initiative?' or 'Whose concerns do we consider?', others were more provocative: 'Women are more materialistic and bigger consumers than men. So shouldn't they care more?!' However, regardless of the tone, we intentionally used a question-like format to create a sense of exploration and curiosity, persuading designers to read the information provided on the back. Finally, the questions were formulated broadly, without necessarily implying the validity or invalidity of any immediate answer designers could have. So even if they were to guess the wrong answer, the tone of voice did not imply a shaming experience, and the information on the back could serve as an educational opportunity. On the back side of each card was a concise summary of empirical research framed as fact. The summary allowed designers to easily access and grasp researched-based information. Additionally, each card presented a list of actionable tips to inspire designers to adopt more gender-sensitive practices.



Figure 39. Sample of Consumption cards

# REFLECTION

Upon reflection, we decided to reformulate some provocative statements before proceeding to the test. We identified the need to balance being provocative enough to inspire creative thinking while avoiding potential misinterpretation and confusion among test participants. After all, the tool was intended to support designers in their process, not distract them. Rewriting the statements also aligned with the feedback from the expert interviews in Develop phase (E2 and E10) that suggested that the cards could be thought-provoking but must avoid exaggeration.

Furthermore, we also recalled our reflection from the literature review, where we discussed that consumption is not as commonly encountered in the context of service design, as it is mainly connected to fields such as sociology or behavioural economics. We also observed in the interactions with our experts that framing the conversation around sustainable or circular consumption required several examples and clarifications for them to reflect on the topic.

Finally, consumption was not a part of typical design tools or toolkits we reviewed. Therefore, we wondered whether presenting both findings and tips (on the back side of each card) could be too overwhelming. To test this, we decided to also include two versions of the back sides, one providing only facts and one providing facts and tips.

### 9.2.4 Third pillar: Designing gender-sensitive circular service

Finally, after tuning their sensitivity through the use of knowledge-driven Consumption cards, the idea was for the designers to select a Practice card (aligned with the focus of their brief, e.g., repair or recycling) (Figure 40) and apply their learning to devise a plan for designing their circular service in a gender-sensitive way. In total, we developed 13 Practice cards (Table 19).



Figure 40. Sample of Practice cards

Table 19. Overview of the selected circular practices for which we developed Practice cards



**Reuse and resell** - card that promotes extending the life of existing resources by reusing them (for their intended purpose) and maximising their utilisation

**Lease or rent** - card that promotes rethinking ownership, through leasing or renting services, in order to maximise the resources & products that are not utilised at full potential

**Repair** - card that promotes repairing resources and products to extend their lifespan and prevent unnecessary or premature waste

**Refurbish** - card that promotes the elevation of existing resources by refurbishing with the purpose of extending their life and usability

Repurpose - card that promotes finding a new purpose for resources that would otherwise be discarded

**Upcycle** - card that promotes the "recycling" of wasted resources in a way that adds more value to the initial resource(s), creating new and unique opportunities

Recycle - card that promotes finding a new purpose for resources that would otherwise be discarded

**Downcycle** - card that promotes the "recycling" of wasted resources in a way that lowers the value of the initial resources, creating new and unique opportunities

**Dispose** - card that promotes the responsible disposal of waste (environmentally-friendly waste management practices), as it is sometimes necessary

### 9.2.3 Final remarks on the concept flow

At this point, we presented the key concept pillars and introduced all initial card decks. As mentioned previously, the decks would be accompanied by a leaflet or manual clarifying their use. Importantly, the card decks were envisioned to be used both by individual designers and design teams. While no specific template framed the work with the cards, we planned to evaluate (during our testing sessions) whether we could find a specific order that proved to be the most optimal one. Even so, this would only be an optional suggestion included in the leaflet, as we imagined that designers could use the cards in various settings and at various times. For example, the Positionality card deck could be used at the beginning of any project to raise awareness of the designers' biases or analyse whether the project briefing primes the team members in a way that creates inequality for the service end-users or customers. The Consumption cards could be used to support individual brainstorming sessions or team discussions early in the design process. And lastly, the Practice cards provided an overview of circular strategies designers can get inspired by or use in their other circular projects.

However, we acknowledge that the most beneficial experience for both designers using the cards and the project outcome is the combination of card decks, as it overlaps the knowledge and perspectives of circular consumption, gender sensitivity and own understanding of biases and privileges.

# 9.3 First testing

We knew that testing the prototype with real potential users would provide valuable perspectives and ideas, as well as help us build even more empathy towards our target group (Luca & Ulyannikova, 2020). As previously mentioned, the card deck would be accompanied by a manual, but we decided to direct the testing sessions on the practicality of the cards rather than the manual. We evaluated the insights we could gain from the interaction of the users with the cards as being extremely beneficial, especially in evaluating the clarity of language, level of detail, and general level of understanding.

## 9.3.1 Planning and recruitment

In order to gather feedback and refine the concept, we reached out to previously interviewed experts and classmates via email. We deliberately selected individuals who already had some understanding of our project, as this allowed us to maximise the time spent together during the testing phase. By avoiding the need to extensively explain the topic, we could instead focus our discussions on utilising the tool effectively.

During the initial round of testing, we employed two approaches. The first involved an individual test, where a service designer (E15), our classmate, tested the tool independently. This allowed us to observe her experience and gather valuable insights to evaluate whether a solo service designer could use the tool. Additionally, we conducted paired testing with a pair of service designers (E13 and E18). In this scenario, one of our classmates (E18) was paired with a previously interviewed expert (E13). By engaging both individual testers and paired testers, we hoped to capture a range of perspectives and gather diverse feedback on the prototype.

## 9.3.2 Participants

Table 20. Overview of the recruited test participants

#ID	Background information	Gender	Interview format	
E15	MSc student in Service Systems Design at Aalborg University (Denmark)	Woman	Digital, interviewed	
	About this expert: E15 is one of our classmates. E15 has a background in fashion design and interned during the last semester in the strategy business development team of a creative Danish business consulting bureau.		alone	
E13	Service designer and researcher in a design studio (Denmark)	Woman	Digital, interviewed in pair	
	<u>About this expert:</u> This expert has prior experience in communication, UX, CX and research and currently works as a consultant service designer for the public health-care system of a European country.			
E18	MSc student in Service Systems Design at Aalborg University (Denmark)	Woman	Digital, interviewed	
	<u>About this expert:</u> E18 is one of our classmates. E18 has a background in commu- nication and media, and interned during the last semester for a European strategic innovation agency.		in pair	

E15 agreed to participate in our testing session, as she is passionate about sustainability and was curious to learn more about how service designers can be more mindful of consumption. In addition, coming from a fashion design background, E15 had certain expectations and biases towards how women would consume, so participating in this session brought a mutual knowledge-sharing experience.

We decided to pair E13 and E18, respectively a service design professional and a soon-to-be service design graduate, in order to see how a mixed group of designers would use the tool, without having the same background or expertise. They were both familiar with our project concept, as E13 answered one of our surveys and was previously interviewed as well in the context of this project. E18, on the other hand, was familiar with our project as we had mutually shared our progress during informal check-in sessions organised on campus. Additionally, E18 is writing her thesis on ethics in service design, making her a curious candidate for discovering a new initiative promoting gender equality.

### 9.3.3 Testing session structure

The objective of the session was to engage participants, cultivate self-awareness, collect valuable feedback, encourage collaboration, and provide a structured and inclusive setting for meaningful discussions. The testing session took place digitally, via Microsoft Teams. The participants were then shared a link to a Miro board, in order to create an interactive experience and to enable participants to freely document their thoughts. The 90-minute testing workshop was structured as follows:

- 1. First, a concise 5-minute introduction and practical information about the testing session to establish the context and basic rules (e.g. to not hold back and share thoughts).
- 2. To warm up (for E15) and to get familiar with each other (for E13 and E18), we added a 10-minute icebreaker activity.
- 3. Afterwards, we invited the test participants to spend between 5 to 10 minutes on a rating scale activity and discussing its results
- 4. The subsequent 15-minute segment consisted of the Positionality exercise in which the participants tested Identity markers to understand what shapes their worldview regarding sustainable consumption.
- 5. However, the biggest part of the workshop consisted of a 35-minute evaluation of the cards (Consumption and Practice cards) during which participants provided feedback and observations, commenting on the overall content, evaluating how helpful and relevant each card is for taking a gender-inclusivity perspective in design.
- 6. Finally, the session concluded with a 5-minute brainstorming and wrap-up discussion about any additional ideas about the tool and tips for the booklet.

# REFLECTION

Although we were in the final phase of the design process, we kept gathering insights about the experts' general understanding of gender, consumption, and their relevance for service design. For example, we included an open question in the testing session, asking participants to define their understanding of gender as designers.

# "If I should put my understanding of gender into words, this is what it means to me as a designer..."

Afterwards, we asked them to do a self-evaluation exercise using rating scales (point 3 in the testing session structure), assessing the importance of focusing on gender in the design process, their confidence in including a gender perspective, and their preparedness to apply gender considerations in their design process.

The rating exercise aimed to explore how different service designers perceive the role of gender and compare their evaluations with their readiness and confidence levels. Furthermore, this exercise served as a transitional step towards introducing the cards.

# 9.3.4 Findings

### 9.3.4.1 Rating importance, confidence, and readiness

The icebreaker activity proved challenging as participants struggled to write a scenario around repair without filling it with personal experiences. Therefore we decided to remove the activity from future testing to focus on gathering feedback on other parts of the prototype. In the next preparation activity (i.e., the rating exercise), all three participants expressed a high importance placed on incorporating a gender perspective in the design process. When asked about their confidence to apply it, they ranked their confidence higher than average. However, their readiness or preparedness to tackle the gender topic ranked lower than average. This highlights the need for support and knowledge to enhance service designers' confidence in addressing gender-related considerations.

Participant statements further emphasised the challenges faced in dealing with gender in design, including fear of making mistakes and unintentionally being rude, the contextual dependence of gender, confusion in understanding the concept, and the desire for additional education and guidance. These insights underscore the complexities surrounding gender and the need for resources to navigate these complexities effectively. "I would be afraid to get it wrong and be rude towards people I am trying to be inclusive with" (E15)

"Gender is very context dependent; for some projects it can be very critical, but in some it is not such a big factor - or maybe is it? We might not know ..." (E18)

"I am confused about gender because it is so hard to understand what it is... I find it hard to even know where to start [..] If I were to be on such a project (note: refers to circular consumption), I would use a lot of extra time to educate myself- read studies, take an online course on gender in design during the weekend and ask ChatGPT many questions to make sure I am not going to do anything offensive" (E13)

# 9.3.4.2 Identity markers and Positionality cards

During the positionality exercise, participants recognised a potential challenge in terms of how different individuals could have different levels of comfort when sharing personal positionality. To address this concern, it was suggested to create a disclaimer or prompt that establishes a safe space within the team, enabling people to share their experiences and biases without being judged. Furthermore, it was pointed out that a diverse team might have different dynamics. For example, a female service designer might not feel comfortable discussing her financial situation or body image with a developer who is a man. Therefore, we were suggested to find a way to accommodate this perspective as well.

# 9.3.4.3 Consumption and Practice cards

In evaluating the cards, participants provided valuable feedback. First, they found the tips to be too complex and potentially distracting from the main topic, suggesting the possibility of compiling them into a separate checklist. However, they appreciated the inclusion of relevant questions and recommended exploring how the tips could be related to different project stages (i.e., not only at the project start). Lastly, examples and case studies were deemed helpful in making the theory less abstract and aiding comprehension.

Regarding the format of card usage, participants suggested including more questions rather than factual text to facilitate ease of use for individual designers or teams. They believed the question format would initiate conversations and engage individuals who may not typically participate in such discussions while also sparking internal brainstorming processes. Finally, the facts presented on the cards were well-received, having designers either learning new information or being reminded of important details they overlooked. Nevertheless, one participant (E15) distrusted some facts and asked to include references on each card or in the booklet.

# 9.3.4.4 Conclusion

Overall, the feedback collected from the icebreaker, rating exercise, and card evaluations provided valuable insights regarding possible challenges designers might encounter, when using the tool, as well as outline some preferences and provide new ideas we can iterate on.

Participants validated the general value of using such a card-like tool in any design project, regardless of the project's focus on gender or circular consumption, as it has the potential of raising awareness and inspiring the adoption of new mindsets.

# 9.4 Prototype iteration

We had only one day to iterate on the prototype before our next session (a sparring session with our peers), so we had to quickly regroup and iterate the existing prototype or create a new, lo-fi prototype version. When discussing the results and ways to act on them, we agreed on a pressing problem we both observed in the test: We expected the tool to have a more profound impact on the participants than it did. For example, towards the end of the session, we could notice participants' perspectives containing some initial bias they explored during the icebreaker or positionality exercise (e.g., women being bigger consumers). Furthermore, after having gone through all the factual, research-based data cards, some participants still saw them as purely interesting or hard to believe. Observations like these made us believe we must reframe the whole setting.

Therefore, after this alignment session, we decided to transform our multifaceted tool into a toolkit, meaning that rather than providing decks of cards targeting different focus areas, we would better frame the workflow and main-

tain designers' focus on gender issues. As a result, the iterated toolkit concept consisted of the following:

- A booklet or manual to explain the project's motivation, present a glossary of relevant terms, introduce researchbased evidence on gender differences in circular consumption, and provide a checklist with the practical tips previously used on the backside of each card.
- Positionality exercise (although we planned to consult our peers on the different directions the exercise could take)
- Consumption cards
- A new set of Gender cards<sup>3</sup>
- Practice card

We also decided to create a template (Figure 42) for designers to use, along with the Consumption and Practice cards. The template began by framing the circular practice service designers planned to include in their service (e.g., repair). Then, after a step-by-step guided process of short ideation to reflect on and evaluate the challenges of the practice, designers would conclude the exercise by taking in a gender perspective. The new Gender cards would help them apply the perspective by asking designers to reflect on questions centred around access, needs, data, or opportunities.



Figure 42. New template for guided gender sensitivity.

# 9.5. Peer feedback

As we were approaching the final project weeks, we agreed with two of our classmates (Table 21) to mutually provide feedback on each other's thesis project and its output. Teamwork and collaboration are often encouraged in the context of our study programme, so we decided to use this opportunity to receive the input of our soon-tobe graduate peers. Given that we had only limited time, we decided to structure the session as an informal walkthrough during which we introduced different parts of the toolkit, allowing our peers to ask questions, critique, or propose suggestions for improvement.

# 9.5.1 Participants

#ID	Background information	Gender	Interview format
E16	MSc student in Service Systems Design at Aalborg University (Denmark)	Woman	In-person
	<u>About this expert:</u> E16 is one of our classmates. E16 has a background in experi- ence design and interned during the last semester for a Danish strategic innovation		
	agency.		

E17	MSc student in Service Systems Design at Aalborg University (Denmark)	Woman	In-person
	<u>About this expert:</u> E17 is one of our classmates. E17 has a background in design management and interned during the last semester for a Danish research agency.		

### Table 21. Overview of participants in the peer feedback

E16 and E17 were interested in reviewing our prototype, as they were researching different strategies for implementing and fostering kindness in the service design practice. While their approach to kindness did not necessarily take a gender perspective, nor a circularity one, we could relate to each other's process in recognising shared challenges of the topics. For example, when trying to foster a new mindset or challenge the status quo, the service design process can become more abstract, less tangible and the evaluation one has available tends to imply subjective methods based on self-evaluation and reflections.

# 9.5.2 Findings

We had limited time to iterate on the latest prototype, so we combined Miro with hand-drawn sketches to help explain the new toolkit forms and structure. Furthermore, we showed the Positionality cards, the (optional) Project context cards, Consumption cards, Practice cards and finally an initial sketch of the new Gender cards, to quickly illustrate their purpose and tone of voice. As we went through each deck, we also shared the feedback we received so far, our challenges, our motivations and invited them to ideate together with us different strategies of improving the format of the toolkit or mitigating the challenges our previous users had experienced when using the tool.

Regarding Positionality and Identity markers, E16 and E17 validated the importance of reflecting in a context framed by the positionality exercise. However, hearing our learnings on how intimidating group sharing can be for different individuals, they suggested that we make the personal positionality (the positionality questions targeting the designer's own life and experiences) optional and further develop the project positionality. This input was eye-opening to us, as we did not prioritise testing those and realised why this change would take the pressure off the individuals and direct the focus on the design project.

Furthermore, they also validated the logical sequence of the template and appreciated the way one exercise can combine two different and complex individual topics (e.g., designing a circular practice or a service including a circular practice and, respectively, the gender perspective). Moreover, they validated the application possibilities in different team settings and can see the tool applied by both individuals and design teams.

Lastly, they shared their own approach to including evidence in a digestible card-like form. Their solution called 'Knowledge nuggets' cards, was engaging and recommended existing methods to aid designers in their process toward kind design. This solution was inspirational to us as, at that point, we struggled with many lengthy cards and frustration over their limited impact. Therefore, it was helpful seeing how they structured their cards in a simple, clean-looking, and accessible way.

# 9.6 Prototype iteration

After reflecting on the feedback from test participants and our peers, we transformed the positionality deck of cards into three mini decks. First, focusing on *Individual positionality*, embracing individual reflection but leaving it optional to share. Second, introducing *Team positionality*, which invites reflection as a group on stereotypes the whole group (e.g., design team) can be a witness to or a subject of. And finally, *Project positionality* which is referred to reflection centred around the project brief or design task at hand. Next, we decided that the Gender card would be introduced as open questions to help designers reflect rather than only provide knowledge.

Lastly, the previously named Consumption cards became Fact cards, presenting different research-based information about gender impact on circular consumption. However, the tips from the cards were moved to a separate checklist in the booklet. This way, service designers could still access knowledge without being overwhelmed during an exercise.

# 9.7 Second testing

# 9.7.1 Planning and recruitment

Similar to the first round of testing, we contacted previously interviewed experts who showed interest in further keeping in touch with the project. Moreover, we reached out to several of our classmates with an inquiry about joining our sessions session. This time, we were able to recruit only one pair of test participants: an expert who previously answered one of our surveys (E20) and another classmate of ours (E19). As this was our last session,

we had two major test objectives:

- First, we wanted to test the updated cards and validate the new focus of the positionality exercise devised to uncover biases and stereotypes among design teams rather than only focusing on individual designers.
- Second, we wanted to test the flow of using the template. As the template needed to be meaningful within the toolkit and in the designer's realistic workflow, we focused on testing its validity and feasibility

## 9.7.2 Participants

#ID	Background information	Gender	Interview format
E19	Service Systems Design student (Denmark)	Woman	Digital, interviewed
	<u>About this expert:</u> E19 is one of our classmates. E19 has a background in industrial design and research, and interned during the last semester for a Danish service platform company.		alone
E20	User experience designer in a design agency (Denmark)	Woman	Digital, interviewed
	<u>About this expert:</u> This expert has a formal education in digital design and interac- tive technologies and previously worked as a service designer. E20 now works as a UX designer for a Danish consultancy bureau.		in pair

Table 22. Overview of the peer feedback participants

Test participant E19 agreed to test our tool as we had previously shared the progress of our thesis with her. Furthermore, E19 is writing her thesis on the critical and challenging topic of ethics in service design, making her contribution to our project valuable, especially regarding the positionality exercise. The second test participant, E20, accepted the invitation to test our tool, as she was curious to see how the project evolved since she took the citizen survey (subsection 5.7). Moreover, she described herself as willing to learn and driven to continuously expand her knowledge by discovering new design perspectives and practices, which she demonstrated by attending design conferences and workshops.

In other words, we had two highly-motivated test participants interested in learning. This is something we took into consideration when later interpreting test findings.

# 9.7.3 Workshop testing structure

The testing structure was slightly adjusted because we now had a toolkit to test. As mentioned previously, we decided to remove the icebreaker exercise and instead engaged in a short informal discussion before proceeding with the test. Although we removed the icebreaker, we kept the rating exercise, as we were still interested in the test participants' self-assessment of their confidence, readiness, and perceived importance of the topic (i.e., applying gender perspective when designing services promoting circular consumption). Although the scales did not intend the scales to be a warm-up exercise, both test participants became activated, discussing their opinions and ideas about gender. Afterwards, we introduced the updated toolkit, starting with the positionality exercise. Here, we added instructions asking participants to approach the exercise openly and non-judgmentally. Given that we previously tested using the exercise individually, the main focus was on using it as a team and in a project context. Upon testing both Team and Project markers, we proceeded to present Practice cards which we included in two versions. While the first version only described the practice, the second version contained additional examples of existing services. First, we asked the participants to reflect on which card version they would find most usable and why. Then we invited them to pick one that would become the practice around which they would design their new service. We then showed them the template they could use to deconstruct a future project brief and capture their first ideas about the possible concept. In the interest of time, we only discussed the template and tried filling out its minor parts. Afterwards, the participants received a set of Gender cards, which invited them to look over the template through a gender lens by going through and discussing the questions in the deck. Moreover, the participants had access to the Fact cards, which they could use to gain additional perspectives.

Finally, we used the last minutes of the session to look back and evaluate the activities. Here, we focused on unpacking the experience of taking the gender perspective, inquiring about any challenges and hindrances in using the Gender cards and the template. Next, we opened a discussion about the toolkit's feasibility. We were especially interested in hearing E20's perspective as she works in a design agency and might experience time pressures around meeting her deadlines or switching between different projects. Before closing the session, we asked the participants to select two activities they considered most desirable, viable, and feasible.

# 9.7.4 Findings

Next, A/B testing of the Practice cards showed that those providing examples of existing services were preferred by both participants as they found it easier to imagine what circular consumption means. Furthermore, they liked the examples as inspiration and said that they would help them in conducting a landscape or competitor analysis. Perhaps, the most important finding was the insight into separating the template into two. This was motivated by the participants wanting more time between the initial (i.e., centred around the project start) and concept ideation (i.e., centred around brainstorming what a service could be like), allowing them to first gain some understanding about the target group. However, here the booklet must come into play to advise for gender-sensitive data collection.

Aditionally, we received positive feedback on both the Fact and Gender cards as they allowed the participant to interactively build their knowledge through reading facts and answering questions. Moreover, the participants talked about linking the tool's 'freedom', meaning that the Fact cards were there to assist and were not mandatory to go through. Nonetheless, they also admitted that not everyone might read all the cards, making the importance of adding the research summary to the booklet even greater. Additionally, we received minor comments about the tone of voice, which we continued working on to strike the right balance between creating interest and attempting to break norms.

We then looked at the results of the voting exercise. Both participants gave one of their voices to the template and split the remaining two between the positionality exercise and Gender cards.

"I actually liked these Gender cards [..] seems like an innovative tool that brings in a gender perspective in the service design process." (E20)

Finally, they also commented that having had an extra voice, they would have given to the Practice cards as they gave them inspiration and made circular consumption more tangible.

# 9.7.5 Implemented changes

After the test sessions, we implemented the following changes. First, we separated the template into two distinct ones and hence now had two activities supported by guided instructions. Next, we kept only the set of Practice cards containing examples of existing services. Lastly, we began updating and aligning the language and tone of voice across the decks, following tips for UX copywriting such as being concise, shortening the amount of text we were using, utilising numerals, and simplifying the language into a more accessible yet slightly informal and inviting tone.

# 9.8 Final feedback

## 9.8.1 Planning and recruitment

As we were reaching the end of our process, some of the experts that we previously reached out to started getting back to us, offering their help with user testing of the prototype (Table 23). However, they only had between 30 to 45 minutes to spare, meaning that we would not have the time to test the entire toolkit. Therefore, instead of running a test session, we decided to use the experts as reviewers and ask them to provide feedback on only certain parts of the toolkit.

Again, all interviews took place online via Microsoft Teams, and the experts were then invited to our team's Miro board to view the toolkit.

# 9.8.2 Participants

Table 23. Overview of recruited service designers and other experts

#ID	Background information	Gender	Interview format
E4	Senior CX and Service Design Consultant in a large international consultancy house (Saudi Arabia)	Man	Digital
	<u>About the expert:</u> This expert is trained as a service designer and works with a circular economy in business-to-business consulting. E4 has also experience working on service design tools for transi- tion design. Besides that, E4 has also encountered projects focusing on social innovation.		

E21	21 Service designer and facilitator in a design company (Germany)		Digital
	<u>About the expert:</u> This expert is trained in Integrated Design and works now as a service and experience designer in a digital agency. E21 has experience developing her own toolkit focusing on raising gender sensitivity in service design. The toolkit is called The gender lens in the design of services (Sensitive Service Design guide), and we consulted it as part of our resources and tools review in the Develop phase.		
E22	Analysis and coordinator in projects focusing on migration, socioeconomic inclusion, youth work, gender and entrepreneurship (Sweden)	Woman	Digital
	<u>About the expert:</u> This expert is trained in Advanced Migration studies and has a further academic background in gender and women's rights studies. E22 works with projects on integration, employment, entrepreneurship and women's rights, where she focuses on assessing and measuring their impact on the local level.		
E23	Lead analyst and project manager working with the fields of sustainability and climate change (Sweden)	Woman	Digital
	<u>About the expert:</u> This expert is trained in Human Ecology and is currently responsible for devel- oping and executing various projects in her organisation, focusing mainly on integrating envi- ronmental sustainability. E23 is typically involved in research and data analysis but also creates training materials at the end of the projects.		

Although we had four recruited experts, we ran only three sessions as E22 and E23 were interviewed together, given that they work for the same organisation. Furthermore, E4, our previously interviewed expert, is a man, which allowed us to include some level of men's perspective in the final solutions.

As mentioned, the limited time did not allow us to run a full testing session. Therefore, we decided to use the varied backgrounds of this group of experts to receive feedback on the different parts of the toolkit. For example, E4 had previous experience developing service design tools, mainly in the form of templates. Thus, we planned on discussing our two templates with him and exploring how he would use them as a service designer working with circularity. The second service designer, E21, is the author of the Sensitive Service Design guide, which teaches service designers to adopt a gender-sensitive mindset for their projects. Therefore, we wanted to review and receive feedback on the card decks, as these were the main sources of gender-related information. Lastly, E22 and E23 had experience in developing training materials in the context of environmental and social sustainability projects. Their expertise could support us in exploring whether we had missed any activity that could potentially have a bigger impact, given that we continuously did not see the 'aha' effect of the toolkit.

# 9.8.3 Interview Structure

Now, given that the focus of each feedback session varied based on the expert's background, the structure differed too. However, all experts received an introduction to the toolkit and a demonstration of its parts before zooming in on the elements we wished to discuss with them. We also wrapped up each session by asking for overall feedback or sharing any tips on how to improve the toolkit further. As not all reflections were implementable before the thesis hand-in, we included them in the ideas for the toolkit's future development.

# 9.8.4 Findings

We begin with the important feedback from E21, who suggested applying the gender lens (i.e., using Gender cards) earlier in work with the first template instead of using it as a reflection once the template is filled out. In addition to stimulating the gender-sensitive perspective from the beginning of the activity, engaging with Gender cards earlier helps to avoid the scenario of designers filling in the whole template only to later find out they missed out on an important perspective. Except for creating frustration or discouragement, this scenario could be perceived negatively, raising the barrier to designers' willingness to explore and learn more about gender sensitivity. Therefore, we adopted the recommended sequence of steps and introduced the gender perspective (i.e., use of Gender cards) earlier. Except for the Gender cards, E21 also commented on the importance of understanding intersectionality and highlighted that the toolkit must address this. Lastly, E21 encouraged us to normalise some resistance in the way gender sensitivity is accepted, perceived, and integrated.

"One cannot unlearn in one hour what they have learned throughout their whole life." (E21) Next, interviews with E22 and E23 confirmed the value of starting with a positionality exercise and distinguishing between biases and assumptions tied to the individual, team and project position.

Furthermore, they liked the Practice cards, especially the instruction to pick one and explore it instead of looking at circular consumption as a whole. Moreover, along the same line as E21, they argued to include intersectionality, although it is a complex topic to explore. Lastly, we discussed with them our challenge of making the gender sensitivity 'stick' with our test participants and the advice we got from E21 on lowering the expectations about change after a single hour of being more gender aware. Both E22 and E23 agreed and provided their own examples from projects lasting several months that still resulted in a somewhat unchanged view on gender. However, they recommended that we include a possible evaluation exercise to help designers evaluate their progress (as teams or individuals) and learning experience after going through their project using the toolkit.

Finally, we will unpack the feedback from E4, which was extremely valuable to our finalisation of the toolkit. As mentioned, E4 was the only man providing feedback on any of the toolkit concepts or prototypes, meaning that going into a review session with him, we were curious whether his feedback would be dramatically different from the others. The last time we interacted with E4, we had not yet reached the focus on gender and were still exploring the overall social dimension of circularity. Therefore in our email to him, we briefly introduced our reasoning behind the focus on gender and the project's mission to raise awareness among service designers on the differences between genders in circular consumption.

The first encouraging finding was that E4 experienced the toolkit being 'male-friendly'. This was important as he shared with us his initial concerns about joining the session. According to him, discussion about gender inequalities can be tied to criticism or blaming attitudes towards men, which he would not feel comfortable reacting to. However, he perceived the new tone of voice as being friendly and inviting for everyone, including some who might feel self-conscious about unknowingly coming off as offensive or as lacking understanding and training in gender studies.

Next, when it came to the templates, E4 evaluated the sequence of activities, which we managed to iterate on following E21's feedback to introduce the gender perspective earlier as being adequate and inspiring, enabling designers to empathise with different genders. Lastly, E4 had a suggestion regarding the Gender cards format. At that stage, each gender card depicted a question that targeted sensitivity to all genders. For instance, 'What opportunities would you face if your service should equally include men and women (and other genders)?'. Here, E4 suggested that this formulation fails to identify one's understanding of the needs of each gender, leading to a less detailed analysis. Therefore, he proposed an alternative in which the same question is split into four, inquiring about the inclusion of women, men and other genders individually before asking how to include all of them. Finally, we discussed with E4 the different ways of including intersectionality and agreed on incorporating a fifth card asking what other social factors, besides gender, would impact the design of the service.

# 9.8.5 Implemented changes

The last review session proved to be immensely helpful, and we implemented most of the suggestions recommended or coming from our discussions with the interview experts. This means that we changed the order of asking designers to apply the gender lens when working with the templates. We also iterated on Gender cards by splitting them into four sets, asking about the inclusion of women, men, other genders, and all genders. Furthermore, we included cards to make designers aware of intersectionality. Here, the Identity markers can aid this short exercise. Lastly, we decided to add a recommendation on how to evaluate or reflect on the progress of applying gender sensitivity into the booklet.

# 9.9. Final concept

Following the expert feedback and its implementation, we reached the final design concept titled The circular gender lens toolkit. In the next subsections, we will briefly describe the toolkit and reflect on possibilities for its future development. We advise readers to consult the corresponding Process report for a detailed overview of the toolkit instructions and different card decks.

### 9.9.1 The circular gender lens toolkit

The circular gender lens toolkit is designed to support service designers in understanding the role of gender in circular consumption and to offer them practical strategies for applying a more gender-sensitive mindset in their design processes, especially with regard to the first diamond activities. Next to encouraging awareness of gender

biases and stereotypes, the toolkit is intended to support designers in actively reflecting, discussing, and promoting strategies to avoid them. As a result, the toolkit can be used at the beginning of a new or as input to existing design projects.

The toolkit builds on the previously introduced concept of the three pillars, referred to in the final version as Awareness, Sensitivity, and Action (Figure 43). Although the pillars are conceptually connected and can together lead to richer conversations, it is possible to use them separately. Either way, the toolkit's main goal is to help service designers see circular services (and the practices they contain) through a gender lens to spot gender-related needs and opportunities but also barriers and inequalities.

# **TOOL:**





As shown by Figure 43, the toolkit relies heavily on the method of using various sets of cards to drive conversation and personal or in-group reflections. Although the cards are accompanied by templates, they can also be used separately. This decision was informed by the interview findings showing that some designers were more interested in becoming aware or challenged in their thinking but would use their own tools to apply the new knowledge. Finally, two sets of cards (Fact cards and Reflection cards) were placed outside the pillars, as they can be used either at any point in the process (Fact cards) or in retrospect (Reflection cards).

# 9.9.1.1 Awareness pillar

The Awareness pillar is built on the concept of positionality that allows service designers to reflect and engage in critical discussions on the different factors shaping their worldviews. To examine the concept from multiple standpoints, the pillar introduces sets of cards and templates to explore and document Individual, Team, and Project

related positionality (Figure 44). While the Team and Project positionality activities are meant to be discussed and negotiated, the individual exercise is optional for sharing. This decision was motivated by the concerns several of the designers and experts raised during the previous interviews and concept testing.



Figure 44. Overview of Awareness pillar

Regarding outcomes, the pillar should open discussions and consider the possibility of designers' being biassed despite engaging in insights-driven human- and user-centred methodologies. As we know from the expert interviews and feedback sessions, engaging teams in talking about gender might be challenging. Therefore, the Team and Project related cards should remove the focus from individuals and consider the business-as-usual practices of a given workplace or team instead.

# 9.9.1.2 Sensitivity pillar

The Sensitivity pillar aims at applying a gender-sensitive mindset to selected circular practices (e.g., sharing) behind services (e.g., on-demand carpooling) designers are tasked to explore and design. By using the template for Framing circular practices, designers should consider any immediate challenges and opportunities related to their team, the type and amounts of available resources, and the circular practice itself. For example, they can brainstorm or briefly research any documented challenges for uptake and engagement with sharing services. Following that, the template recommends using Gender Sensitivity cards for driving reflections and discussions on why and how designers can proceed in a gender-sensitive way (Figure 45).

The outcome of engaging with the pillar is two-fold. First, it allows designers to explore the benefits and challenges of taking a gender perspective in the projects. Second, it invites brainstorming about ways to make their services more gender-inclusive and equitable. Therefore, the understanding of gender sensitivity emerges through active reflection and participation.



# 9.9.1.3 Action pillar

The Action pillar guides designers in turning awareness and sensibility into action when empathising with users or ideating concept ideas. Similarly to the Sensitivity pillar, the first step is to select a Practice card that aligns with a designer's brief or the practice they want to explore. Then, using the Action toward a gender-sensitive service template, they can start focusing on the different needs, motivations, skills, materials, or abilities people do or must have for joining and using the service. Afterwards, the designers are asked to use the Gender cards to explore how their notes change when seen through a gender lens (Figure 46).

The goal of applying the gender lens is to help designers recognise the need to consider gender in their work and plan for more gender-sensitive research and design. Finally, Gender cards also include Intersectionality cards asking designers to, besides using the gender lens, consider how other factors and identity markers (e.g., ethnicity or social class) affect the reasoning about, access to, uptake, and use of a given circular service.



Figure 46. Overview of Action pillar

# 9.9.1.4 Instruction guide

The toolkit is embedded in a guide that provides service designers with details about the project's roots (i.e., within this thesis) and a short overview of the key research findings. Following the three pillars, designers can also find a checklist with actions for gender-sensitive user research. The checklist was included based on the feedback from the expert interviews, during which several designers asked for placing tips in one specific place rather than tying them to the information on Facts and Gender cards. Lastly, the toolkit includes a short section providing ideas on how they can assess the impact of the toolkit on both their team and projects (Figure 47) With the help of Reflection cards, designers can not only engage in retrospective discussions but also use the tips on the cards to ensure gender sensitivity in their future projects.





### 9.9.2 Limitations

Before exploring some of the tool's future possibilities, we will foremost address its limitations. First, although we developed the tool over several sessions with service designers and other experts, the exact compatibility with the design process and the transition from awareness to action still remain to be validated with a bigger and more diverse sample of service designers (e.g., including more men, other genders, or those working with circular econ-

omy projects). Second, the tool builds on the sole premise that service designers, if assisted with the toolkit, can recognize their and or their project's biases. However, as we observed during our process, understanding stereotypes and biases is neither easy nor straightforward. Therefore, the challenge lies in striking a balance in preventing a 'false confidence' among service designers while empowering them to engage with gender perspectives. Lastly, compared to urban and industrial design, examples of gender inequalities in service design are more abstract and systemic (e.g., access to care or unpaid labour). In our expert interview, one of the experts (E7) shared her experience of providing numerous examples to convince design students and lecturers about the seriousness and reality of gender biases in product design. Considering that gender is already a challenging and political topic to address, the absence of obvious examples of service inequalities might put more pressure on service designers to introduce the toolkit to their peers and superiors.

# 9.9.3 Opportunities for further development

We identified several opportunities for further developing the toolkit. To begin, we considered ways to connect the gender lens to the existing circular design tools, such as user journeys covering multiple uses. As we previously learned from reaching out to the experts behind the well-known Use2Use toolkit, gender was not something they actively considered when working on user-centred circular economy projects. Furthermore, we debated the possible benefits of including the methods of gender analysis, which were raised by one of the experts (E10) during our interviews. Therefore, the application of gender analysis could be explored in the next development of the toolkit.

Finally, and perhaps most importantly, the toolkit's future focus should be on involving designers of all genders to avoid further feminization of the topic. At the same time, we wish to apply a similar process to devise further resources and tools for designers that can tackle other important factors (e.g., social class, age, or disability) affecting people's participation in future circular societies.

## 9.10 Conclusions from the Deliver chapter

The Deliver chapter marks the end of the design process, upon which service designers typically have a prototyped and tested design solution. We began the chapter by introducing the initial design concept, describing in detail each of its parts. Afterwards, we engaged in a series of testing, peer review, and expert feedback, followed by new iterations, internal brainstorming, and continuous refinement. Our final concept has drastically evolved, both visually and conceptually, since the first drafts in Miro. However, several foundational principles remained unchanged (e.g., the need for raising awareness), rooted in our previous research with citizens and design experts.

# 10. DISCUSSION AND CONCLUSIONS

In this last chapter, we will conclude with reflections on the design processes and its outcome. We will also discuss some of the key learnings regarding the role of gender in service design and the relevance of the field for circular economy initiatives and projects. Furthermore, we will extend our previous reflections on the designers' position as change agents.

Finally, we will conclude the chapter with evaluations of our personal goals and learning gained during researching, working on, and writing this thesis.

This chapter is structured as follows:

10.1 Introduction10.2 Reflections on gender as a factor in service design10.3 Reflections on circularity as new area for service design10.4 Reflections on service design's role in change10.5 Conclusions

# **10.1 Introduction**

Our research question and the subsequent problem statement sought to investigate opportunities for service design to spot and act on gender differences and inequalities in the context of circular economy and, more specifically, circular consumption. Following our primary and secondary research, we could confirm that such differences not only exist but might, if not addressed, lead to more gendered experiences of circularity or add to inequalities between genders, especially concerning the invisible domestic labour. Importantly, we also discovered that gender disparities are detectable through typically human-centred methods (such as interviews or observations), which gives service designers opportunities to address them. Although service designers cannot singlehandedly remove centuries of power imbalances and still persisting inequalities between genders, they can open debates and spaces for the collective imagination of circular societies built on awareness and sensitivity to different gender needs.

Yet, during the series of expert interviews, we understood that gender, as a complex social factor tied to one's identity, remains challenging for designers to discuss or actively consider in their design processes. The subsequently developed solution, The Circular Gender Lens, aims to mitigate this challenge by inviting designers to reflect on their positionality, foster a gender-sensitive mindset, and apply a gender lens to take concrete actions. In this final chapter, we will provide the last reflections, focusing on three topics that have repeatedly resurfaced during our process, namely - gender's role in service design, service design and circularity, and service design-ers' ability to function as agents of change.

# 10.2 Reflections on gender as a factor in service design

To begin, we must disclose that despite spending nearly three months reading and talking about gender, we often found ourselves unsure about its exact impact, definition, or ways to write about it. In other words, gender is a complex and evolving concept that affects many dimensions of people's everyday lives. However, there seems to be confusion on just how seriously designers should consider it in service design. We noted several types of discourses found in our primary and secondary research and summarised the different tendencies into three main categories.

First, the traditional service design methods (e.g., personas, user journeys, or scenarios) seem to treat gender as an important but simple demographic. Although service designers can use gender to compare needs and spot differences in how users engage with a particular service (e.g., showing user journeys for a female and male user), this sensitivity tends to occur during data analysis rather than in planning data collection. In other words, while designers inquire about gender, they do not seem to consider gender differences in shaping their research (e.g., ensuring gender-sensitive questionnaires). We theorise that this relatively simple approach omits the social and systemic implication of one's gender and results in the second category in which service designers view gender as largely irrelevant or unimportant. In this category, although motivated by positive intentions to avoid stereotyping, designers argue for focusing on users and their experiences with a service, regardless of gender. Therefore, the premise is that by being radically user-centric, designers can effectively address several barriers, including those tied to gender disparities.

It is important to note that both categories do explicitly focus on gender when designing services aimed directly at women or men. However, while in these situations, the needs and challenges of each gender are closely explored and documented, the previously mentioned strong focus on user perspective leads to a gender-specific rather than gender-sensitive approach. As a result, products and services risk being designed in isolation from a more complex reality in which women and men (and other genders) interact (e.g., resulting in lacking spaces for changing diapers in men's bathrooms or missing emotional support for fathers).

Finally, the last category consists of service designers who argue for the importance of including gender sensitivity as early in the design process as possible. Here, the main argument is that by not being gender-sensitive, designers risk collecting incomplete data or interpreting data patterns stereotypically (e.g., assuming all women are caring). During interviews with designers in this category, we realised their approach required them to apply a certain level of personal activism in proposing and arguing for a gender-sensitive design mindset. However, compared to the personal activism linked to sustainability and circularity that some of the other interviewed designers disclosed, lifting a gender perspective seemed more professionally dangerous as it introduced more risks for designers to be labelled as *troublemakers* or *feminists*.

Therefore, we conclude this reflection by recognising that gender discourse is challenging to navigate for designers, especially those working in commercial settings. Furthermore, the different routes toward becoming a service

designer and the subsequent lack of standardised requirements for the service designer profession also mean that there is no standard way of providing gender-sensitivity training to all practising designers. As a result, the mindset becomes a matter of personal interest and activism.

# 10.3 Reflections on circularity as new area for service design

Now, considering that the current direction of the circular economy field is already an obstacle for service designers wanting to work with sustainability, what other challenges do service designers face? We reflected on two disciplines where service designers typically do not receive training but which our project saw as important: sustainability and consumption studies. Regarding sustainability, we concluded that many designers do not receive formal training and are therefore left to compensate for this by engaging in self-study, commercial courses, or organisational training. This missing academic focus makes it difficult later on for designers to navigate the contested field of sustainability, including its many definitions or key paradigms (e.g., beliefs about the possibility or impossibility of green growth), and to critically reflect on whether all circular solutions are also sustainable. Furthermore, the challenge of understanding sustainable consumption became even apparent during an icebreaker activity in the concept testing session (in Develop phase), during which the participants somewhat struggled to imagine repair practices as a service when asked to consider needed infrastructures, materials, or its impact on users and their behaviour. As a result, the scenarios were sourced from personal experiences and generally commented on as challenging. This finding brings us to the second identified knowledge gap, the field of consumption and its primary interpretation by sociological studies. Reflecting on our own master's studies, we began seeing it as increasingly more important for designers, especially those wanting to participate in the changing consumption paradigm. Here, we debated that besides understanding how consumption occurs during all stages of product or service use, designers must also understand its social and cultural dimensions and the ways consumption is orchestrated through social norms and rituals. This calls for designers to think beyond service and consider the dynamics of a wider social change.

To conclude, we recognise the relevance of service design in transitions to circular economies and societies. However, we also see barriers that make it challenging for designers to enter the field. Finally, as service design tends to live in the shadow of User Experience (UX) design, the question remains whether it must wait for the UX field first to enter the circularity discourse or if it can find its own capacity to step forward.

# 10.4 Reflections on service design's role in change

Our final reflection is dedicated to the previously discussed ideas of designers as agents of change. Earlier, we agreed with the transformative potential of service design but argued that this change-making capacity is neither categorical (i.e., designers are or are not agents of change) nor can be ascribed apriori (i.e., designers are by default agents of change). Following our talks with designers, we further explored this reflection, focusing primarily on three themes concerning the external source of this role, the issues of confidence, and the need for a different mindset.

First, we suggest that the change-making role is assigned to designers externally, for example, by design disciplines or through normative ideas about design. However, the interviewed designers were less confident with this role and reluctant to title themselves as agents of change, especially given the limits of their organisations or job position. For example, several mentioned their lack of influence on decision-making or involvement in latestage service development, giving them only limited possibilities to influence the final service or system. In such situations, designers argued that the technology, not the design, would often be seen as the vehicle for change. Moreover, some designers did not see their organisations as involved in the business of positive change and were, therefore, critical to their own role. On the other hand, a few of the interviewed designers who worked in agencies were more confident about contributing to change, but their short-time involvement in projects made it difficult for them to see it through.

Finally, we debated the possible need for different mindsets when designing conditions for change. Throughout the project process, we realised that change might be better conceptualised as a non-linear process rather than a fixed state (i.e., something that changed to something else). To illustrate, the shifts we experienced during our testing sessions were often subtle and unstable, meaning that the test participants eventually reverted to their original mindsets. While discussing the experience with experts made us understand and normalise this difficulty of a change process, we agreed that designers would benefit from a better understanding of change dynamics on different levels (e.g., personal, cultural, or organisational). Furthermore, we reflected that working with change forces designers to apply different measurements of success, which are not necessarily bound to their solutions but must consider various social factors, structures, and values (e.g., changes in mindsets or established ways of doing).

Finally, looking at large socio-technical transitions, such as the shifts from a linear to a circular economy, designers can increase their participation in change-making processes by promoting speculative and critical design methods that help materialise today's unknowns and explore varieties of possible futures. Inspired by an approach used by one of the interviewed experts (E7), we developed several intriguing posters to make people reflect and discuss their biases and stereotypes tied to gender role and circularity (Figure 48). We would like to distribute these following the hand-in of this report.



Figure 48. Samples of intriguing posters

# **10.5 Conclusions**

We will conclude the thesis by providing brief reflections on the executed design process, the final solution, and our personal learning goals. By choosing to engage with the challenging topics of a circular economy and gender, our process had to begin with an extensive literature review before zooming in on primary research with designers and citizens. As a result, we gained significant insights into the challenges service designers experience when working with both topics. Although we were excited about the positive response from the design community and willingness to provide help with the project, collecting and analysing all interview data was challenging, especially given the short project timeline. When it comes to the final solution, our ambition was to develop a meaningful outcome that speaks to service designers and can perhaps even be incorporated into their standard toolkits. Towards the end, we received a lot of encouragement to continue working on both topics, which motivated us to explore possibilities to refine the toolkit in the future.

Lastly, we looked back at the design principles established in the Develop chapter and reflected on whether we did manage to include all in our final solutions (Table 24).

Design principles	Final solution				
0. ACTIVE REFLECTION (including empathy and care)	We believe that we fulfilled this principle by continuously inviting service design to reflect, using the various sets of cards attached to the final toolkit.				
The principle of active reflection is fundamental to the tool. Besides critically reflecting on the role of gender in a particular circular consumption project, it promotes a conscious process of service designers reflecting on their role in the project, within their team and organisations, in relation to the project limitations and resources, and on the social and environmental impacts of their choices. For example, service designers should reflect on how their design translates into circular consumption opportunities, what practices and roles it stimulates, and what data is used in research and evaluation.					

Table 24. Evaluation of the final solution against the design principles

1. AWARENESS OF GENDER BIAS AND INEQUAL- ITIES Service designers cannot address the issues they are unaware of or have not recognized. Therefore, the tool must raise awareness about gender differences and risks for inequalities in consumption while allowing service designers to acknowledge their own gender biases.	We believe that we fulfilled this principle by introducing several types of positionality exercises, allowing service designers to better understand their viewpoints. Nonetheless, we acknowledge the tool's limitation, which lies in its assumption that designers are capable of identifying biases by engaging with positionality.
2. ACTION TOWARD GENDER SENSITIVITY AND EQUALITY To harness the potential of service designers as agents of change, it is crucial that the tool goes beyond mere awareness and facilitates tangible action. To achieve this, the tools must be designed in a way that enables service designers to seamlessly integrate them into their existing processes while also lowering the entry barrier to engaging with the important issue of gender.	We believe that we fulfilled this principle by continuously inviting service designers to foster sensitivity and turn their discussion to design actions, using the various sets of cards and templates attached to the final toolkit. However, we also acknowledge that the seamless integration with the design process remains to be tested in future iterations of the toolkit.
3. DESIGN FOR LIFE SITUATIONS As service designers start to enter the field of circular economy, they begin to focus on time. From designing services for prolonged use to crafting journeys of multiple-use cycles, service designers should not lose sight of consumption as a complex life domain. Therefore, the tool should remind service designers to practise sensitivity towards how consumption changes over time and what it implies for their design and understanding of gender.	We believe that we partially fulfilled this principle by including a fact card with information from the research about the chang- ing nature of consumption.
4. MINDFUL AND SEGREGATED DATA Good design starts with having access to meaningful and segregated data. This principle requires service designers to pay attention to what data is collected and how that influences the patterns they see in their analysis.	We believe that we fulfilled this principle by including an exten- sive overview of suggestions to adopt a more gender-sensitive approach to data collection and analysis. However, as we did not test the checklist, we cannot claim that it is comprehensive for all service designers.
5. IMPACT Service designers must engage in discussions about the social and environmen- tal impact of their solutions. Therefore, the tool should provide information on how service designers could measure the impact of using it, either within their teams or in a project context.	We believe that we fulfilled this principle by including a series of Reflection cards with tips on how designers can discuss different ways to assess their impact. However, the list was compiled based on feedback from expert interviews and internal brainstorming. Therefore, the validity of the Reflections card and tips remains to be tested in future iterations of the toolkit.
6. INTERSECTIONALITY Service designers must recognize that taking a gendered perspective is only one aspect of designing inclusive and equitable services. While the tool makes them aware of the role of gender, they must always consider other social factors as well (such as race, ethnicity, class, and ability), as they all play a significant role in shaping the lived experiences of the target users.	We believe that we fulfilled this principle by including a series of Identity markers and Intersectionality challenges.
Understanding roots Service designers should always make attempts to understand the roots of the identified challenge to better understand and address them.	We believe that we fulfilled this principle by including a set of Facts cards explaining research findings about gender's role in sustainable and circular consumption.

Finally, we believe that our thesis process met the initially identified learning objectives and personal goals. One of the key objectives was to acquire a greater understanding of the theoretical underpinning of the thesis, namely the concepts of gender and circular consumption. We achieved this by gaining knowledge through several rounds of academic literature reviews but also by studying non-academic sources. Furthermore, we fulfilled our wish to engage with service designers and gain practical knowledge of the different ways circular consumption and gender are currently considered, reasoned about, and implemented in service design projects. Although it was not possible to organise co-design sessions or workshops due to the experts' limited time availability, we still strived to create a in-between-experts sharing by introducing all experts to our findings either via email or personally. We believe that we also met the objective of creating a non-judgmental and open space to discuss the topics like gender and inequality by letting experts decide how much they want to share and by acknowledging our own challenges and difficulties.

Last but not least, the thesis project allowed us to explore and be challenged while having fun and experimenting with two complex and challenging topics. Therefore, we conclude this thesis with great satisfaction on our end.

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# 12. Appendix

# Appendix 1

# Overview of interviewed service designers and other experts

ID	Background information	Gender	Number of meetings	Design process stage
E1	Ph.D. Researcher at AAU (Denmark)	Woman	1	Project context
E2	Designer and Partner in a design studio (Belgium)	Woman	3	Project context, Define, Develop
E3	Service Design Leader for Circularity in a large international company (Netherlands)	Woman	2	Project context, Develop
E4	Senior CX and Service Design Consultant in a large international consultancy house (Saudi Arabia)	Man	2	Project context, Deliver
E5	Ph.D. Researcher at AAU (Denmark)	Woman	2	Project context, Develop
E6	Designer and Partner in a design studio (Belgium)	Man	2	Define
E7	Service designer design researcher in future of work fieldlab (Netherlands)	Woman	1	Define
E8	Consultant in supply chain operations and sustainability in a large international consultancy house (Denmark)	Woman	1	Define
E9	Service designer and project manager for Sustainable Consumption and Circular Economy in a non-profit foundation (Sweden)	Woman	1	Define
E10	User researcher, Service Designer and UX Designer in a design studio(Belgium)	Woman	1	Develop
E11	Social designer and researcher in a design studio (Great Britain)	Man	1	Develop
E12	Research and founder of a social innovation studio in design and sustainability (Romania)	Woman	1	Define
E13	Service designer and researcher in a design studio (Denmark)	Woman	2	Develop Deliver
E14	CXO (Chief Experience Officer) in a design agency (Denmark)	Woman	1	Develop
E15	Service Systems Design student (Denmark)	Woman	1	Deliver
E16	Service Systems Design student (Denmark)	Woman	1	Deliver
E17	Service Systems Design student (Denmark)	Woman	1	Deliver
E18	Service Systems Design student (Denmark)	Woman	1	Deliver
E19	Service Systems Design student (Denmark)	Woman	1	Deliver
E20	User experience designer in a design agency (Denmark)	Woman	1	Deliver

E21	Service designer and facilitator in a design company (Germany)	Woman	1	Deliver
E22	Analysis and coordinator in projects focusing on migration, socioeconomic inclusion, youth work, gender and entrepreneurship	Woman	1	Deliver
E23	Lead analyst and project manager working with the fields of sustainability and climate change	Woman	1	Deliver

# Appendix 2

### Survey aimed at service designers working with circular economy

Dear Service Designers, we need your invaluable input! We are Diana and Tereza, two Service Systems Design students from Aalborg University, working on our Master Thesis. We are focusing on circular economy (CE) and its potential (as well as implementation) in service design. We are doing this because we see the understanding of CE as (almost) mandatory in the future, and because we take climate care seriously. We know service designers are able to tackle these issues, but we hope to further understand exactly HOW :)

So, if you have 5-7 minutes, please share your input with us and do not underestimate what an impactful difference you're making!

Thank you in advance!

<u>PLEASE NOTE</u> that the following survey is aimed at students, professionals and academics working with service design and circular economy.

Good to know: We use the survey for educational purposes only and you can withdraw from the survey any time. All your answers will remain anonymous.

### (1) I have read and understood how the data is collected and agree to participate in the survey.

#### Quick facts

First, we need to learn a couple of things about you.

1. With which gender do you identify?

- ° Female
- ° Male
- ° Gender variant/Non-conforming
- 2. What category/description fits you best? (You can select more than one- if relevant).
  - ° Service Design Student
  - Service Design Academic
  - ° Service Design Professional
- 3. What is your current role? (either part-time or full-time)
  - ° Service Designer
  - ° User Researcher
  - ° Experience Designer
  - ° Speculative Designer / Futurist
  - ° Academic Researcher
  - ° Other (please specify) \_
- 4. How many years of service design experience do you have?
  - ° 0-2
    - ° 3-5
    - ° Over 5
    - Over 10
- 5. What industry do you work in?
  - Agriculture & Food industry
  - ° Banking
  - ° Consulting
  - ° Education and Research
  - ° IT & Digital Technology
  - <sup>°</sup> Healthcare and Pharma
  - ° Hospitality and Tourism
  - Manufacturing
  - Non-Profit Organisations
- ° Telecommunications
- ° Other (please specify): \_
- 6. How often do you work on projects focused on the circular economy? [Rating scale]
  - ° Never
  - ° Rarely
  - ° Occasionally
  - ° Frequently
  - ° Very frequently

7. What are the professional challenges you face, as a service designer (or service design practitioner), when working with a circular economy?

- ° Lack of knowledge and capabilities within service design for circular economy
- ° Lack of service design tools and methods for circular economy
- ° Lack of knowledge or interest in circular economy within the organisation
- ° Lack of service design jobs within circular economy
- Lack of support from relevant decision-makers (e.g.management)
- ° Limited resources for circular economy projects
- ° Difficulties to assess impact of proposed circular solutions
- ° Dealing with policies around circular economy
- ° Other (please specify) \_\_\_\_\_

#### CE experience

#### Now, let's hear a bit more about your experience working with a circular economy!

8. What are the top MUST-HAVE capabilities and skills service designers need when working with a circular economy?

- ° System-thinking approach
- Understanding of business and economy
- ° Future-oriented thinking
- <sup>°</sup> Behavioural design and nudging
- ° Understanding of new technologies
- ° Inclusion and social justice
- <sup>°</sup> Understanding of manufacturing and materials
- ° Cross-disciplinary collaboration
- ° Data visualisation and storytelling
- ° Other (please specify)

9. In your opinion, which pillar of sustainability does circular economy address?

- ° Economical sustainability
- ° Ecological sustainability
- ° Social sustainability
- ° All of them
- ° None of them
- Other:

10. In your opinion, to what extent are social sustainability and inclusion considered in your organisation as part of circular economy projects?

- ° Not considered at all
- ° Considered to a small extent
- ° Considered to a moderate extent
- ° Considered to a great extent
- Other (please specify)

#### 11. Do you think social sustainability and justice are integrated in the circular design process? If yes, how? If no, why not?

- ° Yes (please specify) \_\_\_\_
  - No (please specify \_\_\_\_\_

#### Almost there!

#### We have only 5 more questions for you

12. What tools (both specific to Service design & borrowed from other fields) do you use when working with circular economy, as a Service designer? (select all that apply)

- ° Brainstorming and mind maps
- <sup>°</sup> Actors and ecosystem maps
- ° User (customer) journeys and scenarios
- ° Service blueprints

- ° Personas
- ° Value proposition canvas
- ° Business model canvas
- ° Rapid prototyping
- ° Impact maps
- ° Material flow and process maps
- Other (please specify)
- 13. What types of stakeholders do you normally involve in your process? (select all that apply)
  - ° Teammates
    - ° Organisational stakeholders (across departments)
    - ° Supply chain stakeholders
    - ° Stakeholders in production
    - ° Policy makers and local authorities
    - ° Clients (if you work in consulting)
    - ° End-users
    - ° External consultants
    - Other (please specify)

14. What types of participatory/user-involved methods do you use when working with circular economy in service design? (select all that apply)

- ° Interview and surveys
- <sup>°</sup> Brainstorming workshops
- ° Design games
- ° Prototyping workshops
- ° Futuring workshops
- ° User testing
- ° Co-design methods
- <sup>o</sup> I don't work participatory
- Other (please specify) \_\_\_\_

15. Any final thoughts? If we sparked your imagination but failed to cover exactly that topic you have in mind, we are more than curious to hear about it!

Lastly- Would you be interested in having a service design coffee with us, either physical or digital? (We would spend maximum 30 minutes together, elaborating on your thoughts and experiences) Thank you in advance!

- m Sure! (please type your email address) \_\_\_\_\_
- Maybe next time

Thank you for your contribution!

## Appendix 3 Survey aimed at service designers not working with circular economy

Dear Service Designers, we need your invaluable input! We are Diana and Tereza, two Service Systems Design students from Aalborg University, working on our Master Thesis. We are focusing on circular economy (CE) and its potential (and relevance) in service design. We are doing this because we see the understanding of CE as (almost) mandatory in the future, and because we take climate care seriously. We know service designers are already tackling complex problems from health to migration, so we hope to further understand the challenges and needs for working with CE.

So, if you have 5 - 7 minutes, please share your input with us and do not underestimate what an impactful difference you're making!

Thank you in advance!

<u>PLEASE NOTE</u> that the following survey is aimed at students, professionals and academics working with service design. <u>Good to know</u>: We use the survey for educational purposes only and you can withdraw from the survey any time. All your answers will remain anonymous.

#### (1) I have read and understood how the data is collected and agree to participate in the survey.

#### Quick facts

First, we need to learn a couple of things about you.

- 1. With which gender do you identify?
  - ° Female
  - ' Male
  - ° Gender variant/Non-conforming
- 2. What category/description fits you best? (You can select more than one- if relevant).
  - ° Service Design Student
  - Service Design Academic
  - Service Design Professional
- 3. What is your current role? (Either part-time or full-time)
  - ° Service Designer
  - User Researcher
  - Experience Designer
  - Speculative Designer / Futurist
  - Academic Researcher
  - I am not working with service design
  - ° Other \_
- 4. How many years of service design experience do you have?
  - ° 0-2
  - 3-5
  - ° Over 5
    - Over 10
- 5. What industries do you perceive as being most likely to work with circular economy? (Select all that apply)
  - ° Agriculture and Food industry
  - ° Banking
  - ° Consulting
  - \* Education and Research
  - ° IT and Digital technology
  - Healthcare and Pharma
  - ° Hospitality and Tourism
  - ° Manufacturing
  - ° Non-Profit Organisations
  - Telecommunications
    - Other (please specify):

#### Service design and circular economy

Please share your thoughts about the tools, capabilities and challenges service designers might face when working with a circular economy.

6. In your opinion, which pillar of sustainability does circular economy address?

- \* Economical sustainability
- Ecological sustainability
- Social sustainability
- All of them
- None of them
- Other:

7. How often do you think service designers work on circular economy projects?

- ° I am actually not sure
- ° Never
- Rarely
- ° Occasionally
- ° Often
- Very often

8. What are some professional challenges you imagine service designers face when working with circular economy? (select all that apply)

- Lack of knowledge and capabilities within service design for circular economy
- ° Lack of service design tools and methods for circular economy
- ° Lack of knowledge or interest in circular economy within the organisation
- ° Lack of service design jobs within circular economy

- <sup>°</sup> Lack of support from relevant decision-makers (e.g.management)
- \* Limited resources for circular economy projects
- ° Difficulties to assess impact of proposed circular solutions
- <sup>°</sup> Dealing with policies around circular economy
- ° Other (please specify)

9. In your opinion, what are the top MUST-HAVE capabilities and skills service designers need when working with circular economy?

- ° System-thinking approach
- <sup>°</sup> Understanding of business and economy
- ° Future-oriented thinking
- Behavioural design and nudging
- Understanding of new technologies
- Inclusion and social justice
- ° Understanding of manufacturing and materials
- Cross-disciplinary collaboration
- ° Data visualisation and storytelling
- ° Other (please specify) \_

10. Let's imagine that you are asked to work on a circular economy project, developing repair & recycling services. What tools (both specific to service design and borrowed from other fields) would you consider using? (select all that apply)

- Brainstorming and mind maps
- Actors and ecosystem maps
- ° User (Customer) journeys and scenarios
- ° Service blueprints
- Personas
- Value proposition canvas
- Business model canvas
- Rapid prototyping
- Impact maps
- Material flow and process maps
- Other (please specify)

#### Almost there!

#### We have five more questions for you.

11. How relevant do you think service design is, in relation to circular economy?

- I am actually not sure
  - ° Irrelevant
  - Almost irrelevant
  - ° Moderately relevant
  - Very relevant
- 12. Would you personally see yourself working with circular economy? Please argument your choice briefly.
  - Yes (please specify why) \_
  - No (please specify why) \_\_\_\_

13. How well equipped do you think service designers are (in terms of education, tools, training), to tackle circular economy projects [Rating scale]

- Very unequipped
- Rather unequipped
- ° Neither equipped nor unequipped
- Moderately equipped
- Very equipped

14. Imagining that you are transitioning to working with more circular projects, how confident (in terms of your education, tools, training) are you in your service design skills?

- Very unconfident
- Rather unconfident
- ° Neither confident nor unconfident
- Moderately confident
- Very confident

15. Any final thoughts? If we sparked your imagination but failed to cover exactly that topic you have in mind, we are more than curious to hear about it!

Thank you for your contribution!

### **Appendix 4** Interview guide for expert interviews with service designers and other experts

#### Introduction and consent

Hello, and many thanks for taking your time to participate in today's interview. This interview will take approximately <u>30 minutes</u>. As I told you before, we are [introduction to the thesis]

But before we begin, I have some important information: [Informed consent] All information collected in this interview is for educational purposes only. Please keep in mind that there are no right or wrong answers, I am interested in learning about your personal thoughts and experiences as an expert and designer. Your answers to my questions will remain confidential to the best of my ability. In my student project, you will be identified through identification numbers. You have the right to withdraw from the interview at any point. We would like to transcribe this interview (Microsoft Teams can do this directly for us, without video or audio recording).

Do we have your consent? [If participant agrees, the interview continues]

Do you have any questions for me before we start?

#### Survey results

We have now analysed the survey results and would like to share the most interesting findings with you:

- Service designers (with various seniority levels) evaluate the top "must-have" competencies as being:
  - cross-disciplinary collaboration,
  - system thinking,
  - understanding of business and economy
  - and lastly *future-oriented thinking*.
  - The top challenges among service designers (working with CE) are:
    - assessing the impact of the solutions (both social and environmental),
    - lack of support from relevant decision-makers
    - and lack of knowledge or interest in CE within the organisation.

#### **Discussion**

Can you tell me about your experience with CE? (challenges, pitfalls, tools)

- What levels of system thinking do you believe are crucial for circularity?
- What do you think is the way to open up the space (also economically) for Service Designers?
- Tools our research shows that a standard service design toolbox is enough do you agree? What is your experience?
- What levels of system thinking do you believe are crucial for circularity?
- How can service designers measure their impact?
- What do you think about the concept of circular society?
- In your opinion, how is social dimension considered in a circular economy?

# Appendix 5

# Overview over reviewed non-scholarly articles about circular and sustainable consumption

Source	Link
12 ways to live more sustainably	https://www.biologicaldiversity.org/programs/population_and_sustainability/sustainability/live_more_s ustainably.html#voice
100+ Simple Tips To Live a More Sustainable Lifestyle	https://theminimalistvegan.com/live-a-more-sustainable-lifestyle/
22 Simple Tips To Live a More Sustainable Lifestyle in 2022	https://www.msc.org/en-us/media-center/blog/news/2021/12/06/22-simple-tips-to-live-a-more-sustain able-lifestyle-in-2022

What is sustainable living?	https://theecohub.com/what-is-sustainable-living/
85 Sustainable Living Tips For Your Home	https://theecohub.com/sustainable-living-tips/
Sustainable living: 58 tips for a more sustainable lifestyle	https://www.cbs.de/en/blog/sustainable-living-tips-for-a-more-sustainable-lifestyle/
7 nemme tips til en mere bæredygtig livsstil	https://elou.dk/7-nemme-tips-til-en-mere-baeredygtig-livsstil/
5 nemme måder, du kan leve mere bæredygtigt på	https://www.alt.dk/artikler/5-nemme-maader-du-kan-leve-mere-baeredygtigt-paa
Bæredygtighed: 11 lette tips til en mere bæredygtig livsstil – i dag	https://mydailyspace.dk/2017/05/baeredygtighed-tips-baeredygtigt-liv/
39 tips fra Tænk: Så nemt er det at gøre hverdagen mere grøn	https://www.alt.dk/artikler/39-tips-sa-nemt-er-det-at-gore-hverdagen-mere-gron
5 Simple Ways Men Can Add More Sustainable Fashion to Their Wardrobe	https://the-ethos.co/sustainable-menswear-tips/
Sustainable Living Tips for Men: Practical Ways to Make a Positive Impact on the Environment	https://menwhoblog.com/blog/sustainable-living-tips-for-men.html

# **Appendix 6** Survey about circular consumption aimed at citizens (ENG version only)

Hello! We need your invaluable input! We are Diana and Tereza, two Service Systems Design students from Aalborg University, working on our Master's Thesis. Together we explore the topic of sustainable consumption in everyday life and what it means for citizens.

In this survey, we want to understand what activities people engage in and what they find challenging to consume sustainably. So, if you have **6-7 minutes** to spare, please share your input with us, and do not underestimate what an impactful difference you're making!

Thank you in advance!

#### Good to know:

We use the survey for educational purposes only and you can withdraw from the survey any time. All your answers will remain <u>anonymous</u>.

Don't forget that there are no right or wrong answers - we are interested in learning about your personal views and experiences!

#### (1) I have read and understood how the data is collected and agree to participate in the survey.

1. With which gender do you identify?

- Female
- ° Male
- ° Gender variant/Non-conforming
- 2. How old are you?
  - ° Below 20
  - ° 20-29
  - ° 30-39
  - ° 40-49
  - ° 50-59
  - ° 60-69
    - Above 70
- 3. What is your highest completed level of education?
  - Finished 9th grade

- \* High school (with or without a diploma)
- ° Technical or vocational training
- ° Bachelor's degree
- Master's degree
- ° Doctorate degree
- Other (please specify)
- 4. How would you describe your household?
  - ° Single household (Living alone)
  - ° Living with parents
  - ° Living with a partner
  - Living with a partner and/or child/children
     Living in a collective (or baying recommented)
    - Living in a collective (or having roommates)

#### Let's talk a bit about your thoughts and habits when it comes to buying, using, and disposing of products.

5. Before we begin, have you previously heard about the circular economy? It says that to live sustainably, we must stop disposing of things but instead use them longer, repair them, share with others, or recycle them.

- Yes, I heard a lot about it.
- Yes, I heard a bit about it.
  No. I have not heard about it.
- No, I have not heard about it.
- ° I am not sure

#### 6. To what extent do you agree or disagree with the following?

	Strongly disagree	Mostly disagree	Neutral	Most agree	Strongly agree
I consider the impact of my consumption activities on the environment.	(1)	(2)	(3)	(4)	(5)
It is important to me to buy or have access to sustainable products.	(1)	(2)	(3)	(4)	(5)
I look for a label on products to learn about their sustainability.	(1)	(2)	(3)	(4)	(5)
Among my friends and family, I am usually the one who advises others on how to consume sustainably.	(1)	(2)	(3)	(4)	(5)
When I buy things, I prefer when they are brand new instead of used.	(1)	(2)	(3)	(4)	(5)

7. There are many ways to consume more sustainably. Which of them do you engage with, and how often?

	Never	Rarely	Sometimes	Frequently	Always
I keep things I own for a long time	(1)	(2)	(3)	(4)	(5)

I share rather than own products like cars, tools, books, etc.	(1)	(2)	(3)	(4)	(5)
l lease products (e.g., tools, cars)	(1)	(2)	(3)	(4)	(5)
I reuse or repurpose things (e.g., reusing old wrapping paper)	(1)	(2)	(3)	(4)	(5)
I (try to) repair things before buying them new	(1)	(2)	(3)	(4)	(5)
I (try to) refurbish things to enjoy them for longer (e.g., painting an old chair)	(1)	(2)	(3)	(4)	(5)
I recycle waste	(1)	(2)	(3)	(4)	(5)
I buy second-hand products	(1)	(2)	(3)	(4)	(5)
I buy less	(1)	(2)	(3)	(4)	(5)

8. What are some of the main challenges in adopting these activities?

Uncertainty on what is actually "sustainable"

- ° Cost (e.g., cost of repairs, more expensive durable products)
- \* Having lower-quality items (e.g., worn-out clothes)
- <sup>°</sup> Lack of time (e.g., repairing/refurbishing can take longer than buying it new)
- <sup>°</sup> Lower comfort and freedom (e.g. being dependent on the car-sharing)
- <sup>°</sup> Lack of knowledge (e.g., not knowing where and how to lease products)
- <sup>°</sup> Lack of skills (e.g., not having skills to repair)
- Missing out on trends and new technology
- ° Other (please specify)

9. Lastly - Please finish the following sentence: "The future where we share things, repair them at home, and get by with fewer things sounds to me...."

Thank you for your contribution!

# Appendix 7 Interview guide for interviews with citizens

#### Introduction and consent

Hello, and many thanks for taking your time to participate in today's interview. This interview will take approximately <u>30 minutes</u>. As I told you before, we are [introduction to the thesis]

But before we begin, I have some important information: [Informed consent] All information collected in this interview is for educational purposes only. Please keep in mind that there are no right or wrong answers, I am interested in learning about your personal thoughts and experiences. Your answers to my questions will remain confidential to the best of my ability. In my student project, you will be identified through identification numbers. You have the right to withdraw from the interview at any point. We would like to transcribe this interview (Microsoft Teams can do this directly for us, without video or audio recording). Do we have your consent? [If participant agrees, the interview continues]

Do you have any questions for me before we start?

#### Introduction

First, I would like to briefly talk about consumption in general. That means, consumption related to everyday life like shopping for food, clothes, electronics, etc.

- Ok, let's begin. Can you tell me a bit about yourself?
  - How would you describe, in general, your consumption attitude?
    - What type of consumer do you think you are?
    - What matters to you when making that decision?
  - Have you ever heard about sustainable consumption?
- What does it mean to you?
- If we think about your household is there any one in particular who has a stronger opinion about certain items or services that are consumed, in term of their sustainability?

#### Transition to circular consumption

- Have you heard about the circular economy?
- What do you think about consuming more circularly? In other words, keeping things for long and avoiding waste?

# We will now discuss consumption in a circular economy. That is when we keep things for longer, repair them, share them with others, or recycle them.

#### Prolonged use

- Would you say that you keep things over a long time?
  - Why yes/Why not?
  - What are the things you typically keep for long? What do you typically keep shortly?
  - What do you do to keep your things for longer?
  - What about skills and materials?

#### **Repair**

- Would you say that you repair things instead of disposing of them?
- What do you repair yourself, what do you repair professionally?
- How often do you repair something?

#### Sharing

- Are there any items/services you share with others?
  - What about sharing tools and items?
  - What about car sharing?
  - Do you share anything else?
- What are some barriers to sharing?

#### Recycling

- How common is it for you to recycle?
- What do you recycle? And what do you need for it?
- Where do you typically have the opportunity to recycle?

#### Future consumption

• Do you think we will consume differently ten years from now? What will change?

#### Wrap-up

- Do you have anything you would like to add? Maybe something we did not get a chance to talk about?
- Do you have any questions for me before we end here?

Thank you for your time and goodbye!

### **Appendix 8** Interview guide for expert interviews with service designers and other experts

#### Introduction and consent

Hello, and many thanks for taking your time to participate in today's interview. This interview will take approximately <u>30 minutes</u>. As I told you before, we are [introduction to the thesis]

But before we begin, I have some important information: [Informed consent] All information collected in this interview is for educational purposes only. Please keep in mind that there are no right or wrong answers, I am interested in learning about your personal thoughts and experiences as an expert and designer. Your answers to my questions will remain confidential to the best of my ability. In my student project, you will be identified through identification numbers. You have the right to withdraw from the interview at any point. We would like to transcribe this interview (Microsoft Teams can do this directly for us, without video or audio recording).

Do we have your consent? [If participant agrees, the interview continues]

Do you have any questions for me before we start?

#### Research results

Introduce selected key findings:

- Consumption is gendered
- Circular consumption: eco-friendly and gendered
- Going circular means work
- The gendered circular home
- The feminine vibe of circularity
- The mutual influence

#### Research reflections (first 15 minutes)

- What do you think about the findings? Was anything new or surprising to you?
- What are your thoughts when thinking about possible gender differences and circular consumption?
- Are the needs of women different from the needs of men?
- As a designer, what are you experiences in considering gender at your company?
- Are there any direct inequalities you see? Behind those connected to invisible labour?

#### Role of service designers (second 15 minutes)

- Thinking in the context that design involves gender equality, what kind of knowledge and limitations do you think designers have?
- How well do you think service designers can pay attention to gender or other differences? (e.g., class)?
- What role does user research play here?
- What roles would you say service designers have in mitigating the gender inequalities in consumption labour, and ultimately in building a circular society?
- We can see that the tools created for designers do not usually encourage them to consider questions of class, gender, ethnicity but that consumers or users are seen more homogeneously. What are your thoughts on it?
- How can designers be sensitive to these injustices in their work? How can we bring them up?

Thank you for your time and goodbye!

## Appendix 9 Overview of future scenarios

ID	Description	Image
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1	ZERO WASTE IS BACK In 2033, single-use plastic is hardly used. When it comes to everyday things (shopping, cleaning, storing), everyone has their favourite repurposed containers, bags and textile scraps on hand, that they <i>keep</i> <i>reusing and reusing</i>	<text><text></text></text>
2	SHARING IS CARING In 2033, ownership is frowned upon. "Do you <i>really</i> need it?!" - they thought judgementally, as people were buying rather than borrowing from the special libraries and stations.	<text><text><image/></text></text>
3	MINDFUL CALENDAR In 2033, we all know what is really important. We plan our lives and work around practices that help us enjoy clean water, air, and nature, rather than the other way around, as our parents' generation.	NIDFUL CALENDARRoyan var kives and work around practical rather than the other way around, as our rather than the other way around, as our service generation.Image: Comparison of the other way around, as our rather than the other way around, as our rather than the other way around, as our type of the other way around aro
4	GARDENING FOR ALL In 2033, gardening is no stranger to any of us. Growing our own food at home shows a great social status and financial stability, while composting is the greatest luxury people can dream of, having in their flats.	<text><text></text></text>

5	FIXING IS SEXY & COOL In 2033, fixing things is as natural as it gets. What you cannot repair on your own can almost certainly be repaired in any local repair coffeeshop.	<text><text><image/></text></text>
6	YOUR NEIGHBOUR IS YOUR ALLY In 2033, neighbourhoods will be essential. Within neighbourhoods, you can share spaces and tools or ask your neighbour for help.	<text><text><image/></text></text>
7	MODULAR IS THE NEW BLACK In 2033, everything feels and looks modular. <i>Swap, upgrade, scale,</i> <i>repeat</i> - these are the ways to stay on trend.	<text><text><image/></text></text>
8	SHOPPING (S)MALL In 2033, shopping malls will be less about shopping and more about <i>engaging</i> . Water parks, botanical gardens, and food courts are the way to go. For shopping, you go to certified sustainable and second-hand shops	<text><text><image/></text></text>

9	ZERO-WASTE FOOD SHOPS In 2033, there are three things to remember when going to a store - your wallet, bag, and food containers. All supermarkets have a strict zero-waste policy for essential food items.	<text><text></text></text>
10	GETTING HANDY AT HOME In 2033, new products like home decorations and furniture will be expensive as they are made locally from sustainable sources. So, to make your home feel nice, you might do what many people do: up-cycle and refurbish	
11	RECYCLING IS MANDATORY In 2033, recycling is mandatory and dictated by law. To help people recycle everything, all buildings have friendly recycling rooms where people can leave their waste and earn citizen points for their efforts.	<text><text><image/></text></text>

# Appendix 10

### Interview guide for expert interviews with service designers and other experts

- How do the experts experience gender differences and possible inequalities during their work as designers, and more specifically service designers.
- What are experts' needs and wishes for a design tool addressing gender differences in circular consumption? When and how would they use such a tool?

#### Introduction and consent

Hello, and many thanks for taking your time to participate in today's interview. This interview will take approximately <u>30 minutes.</u> As I told you before, we are [introduction to the thesis]

But before we begin, I have some important information: [Informed consent] All information collected in this interview is for educational purposes only. Please keep in mind that there are no right or wrong answers, I am interested in learning about your

personal thoughts and experiences as an expert and designer. Your answers to my questions will remain confidential to the best of my ability. In my student project, you will be identified through identification numbers. You have the right to withdraw from the interview at any point. We would like to transcribe this interview (Microsoft Teams can do this directly for us, without video or audio recording).

Do we have your consent? [If participant agrees, the interview continues]

Do you have any questions for me before we start?

#### Presenting discovered issues

Introduce selected key findings:

- Challenging for designers to talk about gender
- Design teams are gendered
- Designers might not know much about gender

#### Research reflections (first 15 minutes)

- What do you think about the findings? Was anything new or surprising to you?
- What are your thoughts when thinking about the challenge of lifting gender perspective in design work?
- Have you experienced something similar?

About the tools (second 15 minutes) Our goal is to create a simple tool or model that can help designers consider the systemic implication of designing for (gender) equal sustainable/circular consumption.

- What are your immediate thoughts?
- What do you think such a tool must include?
- What should not be in the tool?
- When such a tool should be used?
- Who should use it?
- What should the tool help you to do?
- What are the risks it can bring?

#### Thank you for your time and goodbye!