

Engaging young adults in more conscious consumption

*Can Design for Awareness engage
young adults to more consciously
consume mobile phones?*

Veronica Wachek Hansen



Thesis submitted for the degree of
Master of science in Informatics: Design, use,
interaction
60 credits

Department of Informatics
Faculty of mathematics and natural sciences

UNIVERSITY OF OSLO

Spring 2018

Engaging young adults in more conscious consumption

*Can Design for Awareness engage
young adults to more consciously
consume mobile phones?*

Veronica Wachek Hansen

© 2018 Veronica Wachek Hansen

Engaging young adults in more conscious consumption

<http://www.duo.uio.no/>

Printed: Reprosentralen, University of Oslo

“Occasional awareness is beautiful. But it is consistent awareness, stable awareness, which leads to lasting change.”(Headspace, 2015)

Abstract

In this thesis, I explore behaviour and awareness related to mobile phone consumption among young adults. This study aims to increase consumers' knowledge about prevailing consumer behaviour and consumption actions related to the premature obsolescence of mobile phones.

The fundamental research focus was to explore if awareness can engage young adults to consume mobile phones more consciously. Theories on *obsolescence*, *consumption*, and *awareness* evaluated the development of the DfA intervention strategies as well as provided an explanation of the prevailing consumption patterns. A qualitative case study followed, in which data on actual consumer behaviour was acquired through both short structured and qualitative interviews. The analysis resulted in the identification of characteristics regarding consumer behaviour in three phases of consumption; *acquisition*, *use*, and *disposal*.

Aiming to address unconscious consumption through design, I investigated intervention strategies based on DfA inspired by the *Design for Sustainable Consumption Behaviour* approach. I investigated how behavioural intervention strategies could be implemented throughout consumption phases to motivate consumers' engagement in more conscious consumption, with the goal of increasing consumer knowledge regarding their unconscious consumption behaviour and further raise their awareness into correct awareness,

The explorations resulted in a proposal for a framework for designers who want to apply Design for Awareness to the principal factors of consumer influences; *emotions*, *lack of knowledge*, and *conflicting goals*. The construction of this framework was influenced by design guidelines retrieved from reflections of actual consumers. Addressing, actual behaviour within the three consumption phases, I found that the proposed framework can facilitate for alternative consumer behaviour. This thesis provides a deeper insight into how awareness can guide and engage young adults to more consciously consume mobile phones.

Acknowledgements

I would like to thank my supervisor, Maja Van Der Velden, for support throughout.

Then, a shout-out to the fabulous group of people I have come to know as *Mastermotivatorene*. I would not be without our numerous "slaberas" and our common exploitation of these "minor" breaks. May there be many more!

To my *Masterchicas*, Pernille, Lone, Oda and Ingrid. From the bottom of my heart I thank you for outstanding camaraderie and continuous entertainment. Halloooo dere; You have undoubtedly enriched every aspect of my life; Support in hard(er) times, modern dance moves in times of frustration, gangster poses in good times, courage in spider times, wine drinking in Cape Town times, sleepovers in friendship times, excessive laughter in master times and obviously an abundance of love and brain farts in our own time. I am grateful for each and every one of you ladies, may we always have each other!

To my friends and family, thank you for being there for me. I am grateful for your genuine interest and support. A special thanks to my dad, for valuable insight, reading whatever came his way, and for using your spare time without hesitation.

Last, but definitely not least, thank you to my fiancé (and personal heater), Anders. Thank you for always bringing a big smile to my face, you make it easier being apart in stressful times. Your words of wisdom, encouragement, and trust mean more than you know and our "late night" conversations have been much needed. Furthermore, thank you, for being beyond crazy, it is one of the many reasons why I love you.

V.W.H.

Contents

Acknowledgments	iii
1 Introduction	1
1.1 Personal Motivation	1
1.2 Research Objective	2
1.2.1 Specifications of research objective	3
1.3 Research Interest	3
1.4 Chapter overview	5
2 Background	7
2.1 SMART Mobile Phones	7
2.2 Introducing Obsolescence	7
2.2.1 Origin and Use	7
2.2.2 Exploring obsolescence	8
2.2.3 Our Culture of Consumption	9
2.3 The case of the Mobile Phone	10
2.3.1 The Telephone	11
2.3.2 The Mobile Phone	11
2.3.3 The Smartphone	12
I Theory	17
3 On Obsolescence	19
3.1 The early days	19
3.1.1 The Phoebus Cartel	19
3.1.2 Economic Chaos	20
3.1.3 Ending the Depression Through Planned Obsolescence	20
3.1.4 "Instilling in the buyer the desire to own"	21
3.2 A Wealth of Information	22
3.3 A Review	23
3.4 Categorization	26

3.4.1	Product	26
3.4.2	Planned	26
3.4.3	Limited Repair, Indirect or Economic	27
3.4.4	Design Aesthetics, Aesthetics, Perceived or Style . . .	27
3.4.5	Technological, Technical, Perceived or Technology . .	27
3.4.6	Perceived	28
3.5	Bringing the Categories Together	28
4	On Consumption	31
4.1	Economic Theories of Consumption and Consumer Behaviour	32
4.1.1	Asocial Individualism	33
4.1.2	Insatiability	33
4.1.3	Commodity Orientation	34
4.2	Strengths and Weaknesses	34
4.3	Toward a New Theory	35
4.4	Social Consumption	35
4.4.1	Consumer behaviour	35
4.4.2	Consumer Society	38
4.5	Patterns of Behaviour	39
5	On Awareness	41
5.1	Understanding Awareness	42
5.2	Situation Awareness	43
5.3	Self-Awareness	43
5.4	Consumer Awareness	44
5.5	Our Definition of Awareness	45
5.5.1	Situation Awareness	46
5.5.2	Self-Awareness	47
5.5.3	Consumer Awareness	48
6	Theory as a Shaping Tool	49
6.1	Shaping a Research Question	50
II	Methodology and Methods	51
7	Design, Consumption and Consumer Behaviour	53
7.1	Design for Sustainable Consumption Behaviour	53
7.1.1	Behavioural Intervention Strategies	54
7.1.2	The DSCB Narration	54
7.1.3	Deciding on the Approach	55

7.2	Design for Awareness	56
8	Research Approach	59
8.1	Underlying Research Paradigm	59
8.1.1	Critical Interpretive	60
8.2	Qualitative Research	61
8.3	Case Study	61
9	Methods	63
9.1	Interviews	63
9.1.1	Identifying Potential Participants	64
9.1.2	The Short Structured Interviews	64
9.1.3	The Qualitative Interviews	66
9.2	Data Gathering - the Process	67
9.3	Ethical Considerations	68
9.3.1	Interviews	69
III	Research	71
10	Findings	73
10.1	Short Structured Interviews	74
10.1.1	Similarities and Differences Within Consumption Phases	74
10.2	Qualitative Interviews	80
10.2.1	Phases of Consumption	81
10.2.2	Participant Identifications	82
10.2.3	Coding	83
11	Discussion	85
11.1	Obsolescence	85
11.1.1	The Categories in Practice	85
11.1.2	Obsolescence and Design for Awareness	88
11.2	Consumption	88
11.2.1	Steered by goals	88
11.2.2	Steered by Habits	90
11.2.3	Steered by Emotions	92
11.2.4	Steered by the Lack of Knowledge	95
11.2.5	Consumption and Design for Awareness	97
11.3	Awareness	98
11.3.1	Incomplete Awareness	98

11.3.2 Optimistic to Change	101
11.3.3 Awareness and Design for Awareness	102
11.4 Towards a More Conscious Consumption of Mobile Phones	102
12 Concluding remarks	105
12.1 Conclusions	105
12.2 Contributions	107
12.3 Further Work	108
Bibliography	111
Appendices	119
A Interview Guide - Short Structed Interviews	121
B Interview Guide - Qualitative Interviews	125
C Summary - Qualitative Interview Findings	131
D Behavioural intervention strategies based on DfA	135

List of Figures

2.1	Picture of the car-telephone	12
2.2	Picture of the DynaTAC	13
3.1	Categories of obsolescence - EPRS	24
3.2	Categories of obsolescence - Aladeojebi	25
3.3	Categories of obsolescence - Cooper	26
3.4	Categories of obsolescence	29
5.1	Three levels of consumer awareness	45
5.2	Consumer awareness	46
6.1	Theory as a shaping tool	49
10.1	Reasons for product obsolescence at UiO	79
10.2	Reasons for product obsolescence in Cape Town	79
11.1	A selected presentation of actual consumer influences within the respective consumption phases	103

Note to the reader: Images and figures without reference are either drawn, illustrated, or taken by the author.

List of Tables

10.1 Individual responses from the short structured interviews	75
10.2 Summary of the short structured interview responses	78

List of Acronyms

The page number refers to the first use of the acronym.

DfSB	Design for Sustainable Behaviour	53
DSCB	Design for Sustainable Consumption Behaviour	53
DwI	Design with Intent	53
EPRS	European Parliament Research Service	22
IT	Information Technology	64
NSD	Norsk Senter for Forskningsdata	68
OS	Operating System	13
PO	Planned obsolescence	19
UCD	User Centered Design	53
UiO	University of Oslo	74

Chapter 1

Introduction

This thesis explores various influences on consumer behaviour...

1.1 Personal Motivation

Within the last two decades, there has been a radical overhaul of the prevailing consumption practices regarding mobile technology. Although they cannot be considered the original smartphone manufacturer, the American corporation Apple Inc. broke ground for overall design and finish when they presented the iPhone at the Macworld conference in 2007 Goodwiin (2017). Being the very first exemplar of the smartphone, as we know it today, the desire for smartphone functionality such as applications, touch-screens, etc. has become increasingly evident in the years since. Consumer demand have contributed to a tremendous growth of the number of mobile phones in circulation. Today that number is still increasing, and smartphones are now widely embraced by the mass market. They are continually evolving, getting even more advanced and will continue to do so throughout the course of this thesis.

As a student of IT and a young adult with a personal interest in technology, I recognize the excitement of acquiring the latest within technology. Newly released models, often with a new and more aesthetically pleasing design, intrigue me. Software upgrades have likely been made, including both enhanced and additional functions, and I am eager to try them out. The excitement might be overwhelming and what once was a desire might now feel like a necessity. Although an assumption, it is my experience that most consumers willingly and eagerly give in to these “needs” and urges. They do this without further thoughts about why they have the incentive to replace their existing mobile phones continuously.

I first became acquainted with the concept obsolescence while taking the course INF5011 - Technology Society Ethics, during my first semester as a post-grad. My supervisor, Maja Van der Velden, and then Doctoral Research Fellow, Margaret Machniak Sommervold, taught the course with great engagement. Their enthusiasm was contagious, and alongside the enlightening course curriculum, I became increasingly interested due to the complexity of the topics. How can people, when taking upon the role of consumers, be so ignorant of our consumption patterns and how we render mobile phones obsolete too prematurely? It seems like consumers are caught in an excessive cycle of consumption and that the majority is not interested in questioning or reflecting upon their behaviour and why they do as they do.

Taking some time to comprehend the overwhelming amount of new-found information, I decided that I wanted my thesis to provide an understanding of the consumption of mobile phones and contribute to heightening the awareness of young adult consumers, such as myself. Influencing them to make the necessary transition towards more conscious consumption, and possibly initiate a long-term change in today's consumption of digital consumer technology.

Another essential motivator for the choice of study was the opportunity to be a part of the *Sustainable Market Actors for Responsible Trade* or SMART-project, based in the Design Group at the Department of Informatics at the University of Oslo. The project started the 1st of March 2016 and is a Horizon 2020 project funded by the European Union. The particular SMART project I have been engaged in was primarily related to *Smarter mobile phones* and the role and impact of design on social and environmental aspects, as well as technology breakdown, obsolescence, re-use, and repair.

1.2 Research Objective

The purpose of this research is to;

- Acquire a greater understanding of consumers' behaviour and awareness in relation to mobile phone consumption among young adults.
- Explore, in-depth, consumers' actual behaviour, using participants reflections to interpret and explain the underlying reasons for their unconscious consumption.

- Provide consumers' with knowledge on their unconscious behaviour related to the premature obsolescence of mobile phones.
- Explore how design can contribute to raised awareness among young adult consumers regarding their current consumption patterns by applying a Design for Sustainable Consumption Behaviour.
- Provide alternative intervention strategies on how to further raise consumers' awareness and motivate them to engage in conscious consumption of mobile phones.

1.2.1 Specifications of research objective

I would like to elaborate on two specifications within my research objective. The first is related to the terms, *unconscious* and *conscious consumption*, and what lies within these terms. The prevailing behaviour of consumers is often recognized as unconscious, meaning that the consumer is not aware of the negative impacts of modern societies rampant consumerism. However, a consumer engaging in conscious consumption will critically reflect upon these negative impacts, re-evaluate their current behavior, and make changes thereafter. Increasing knowledge through reflection and critical thinking will typically lead to raised awareness, and thus initiate a behavioural change.

Sustainable and unsustainable consumption is closely related to unconscious and conscious behaviour. In this study, I have chosen not to use "sustainable" when addressing my case. In Sustainable development is defined as "*seeking to meet the needs and aspirations of the present without compromising the ability to meet those of the future*" (Keeble, 1988). It is made up of 17 goals, and each has specific targets to be achieved (United Nations, n.d.). One of these goals is related to "*responsible consumption and production.*" However, this goal is all-embracing, considering general consumption and production. Going beyond the determined scope of this thesis I chose not to apply the more general term "sustainable consumption."

1.3 Research Interest

One technological device that has been widely adopted and also diffused to an integral part of people's everyday life, is the mobile phone. Its emergence has had a dramatic and lasting impact on, e.g., people's communication practices. According to the latest figures from Statista, the number of mobile phone users worldwide will reach 4.9 billion in 2018

(Statista, 2018a). The growth is very much driven by increasing popularity of smartphone usage. Considering these numbers, there is no doubt that there have been rapid changes in mobile phone technology throughout the last decades. Connected to these changes are incredible advancements, which all are important to why there has been a tremendous growth regarding the number of mobile phones in circulation, and why it is still an increasing number.

Throughout the last decades, the phenomenon of product obsolescence has revived. Mobile phone manufacturers undoubtedly facilitate it, as many use obsolescence to increase profit. However, and perhaps more importantly, consumers themselves continue to support excessive consumption unconsciously, as they perceive their mobile phones as obsolete prematurely and consume new devices on autopilot. As a result, the consumption of digital consumer technology has increased rapidly. While technology has been a key mechanism for social change in the last few decades, moving society forward, the change is paradoxical. Businesses and manufacturers *"seduce consumers with attractive buying experiences with the promise of improving their quality of life, while in reality they constitute a threat to the very quality of life they advertise to improve"* (Srivastava & Pandey, 2016).

As presented in Boks, Lilley, and Pettersen (2017), increasing attention has been directed towards the domain of sustainability and *"environmental impacts caused during the use phase of products, and the significance of the way people behave and interact with products has been acknowledged"*. They are *"negatively impacting the environment"*, through harmful electronic waste or the use of scarce or conflict minerals. The interest on the topic of sustainability has opened up for investigations on how it may be possible to *"influence people's everyday activities through design, to reduce the environmental burden"* (Boks et al., 2017).

Many appropriate design approaches and behavioural intervention strategies could be applied to influence prevailing consumer behaviour. Gaining comprehensive knowledge and further establishing general awareness on the topic motivated me to study the case of mobile phones and the accompanying consumption. Thus, I decided to apply a more educational and informative design approach, as I knew the possible effect and benefits.

These considerations collectively provided the basis for my research interest. With the rapid changes in mobile phone technology the number of devices in circulation increases. Thus, the unconscious consumption of

mobile phones will experience a growth on its own. Rapid and continuous releases of mobile phones will affect the time the device is perceived as obsolete. Strategies for behavioural intervention can influence people's everyday activities through design by increasing consumers' knowledge and establishing general awareness about the topic of sustainability and mobile phone consumption. Hence, my research interest is related to the following question:

"Will raised awareness about the unsustainability of the premature obsolescence of digital consumer technology result in more sustainable consumption"

1.4 Chapter overview

- **Chapter 2 : Background** will provide an overview of topics and concepts which are essential for the understanding of this thesis, namely the SMART1Mobile Phones project, the concept of obsolescence and my case of the mobile phone. In this chapter the section on the mobile phone was written in collaboration with a fellow master student.
- **Chapter 3 : On Obsolescence** will present how obsolescence, and particularly the design approach of planned obsolescence was introduced to society. Furthermore, the chapter is aimed at getting acquainted with the various, but interconnected categories of obsolescence presented in literature. Lastly, the chapter presents an illustrative figure of the merged all-embracing categories, product, planned and perceived, which are thus used throughout the thesis.
- **Chapter 4 : On Consumption** presents and considers the prevailing economic theories of consumption and consumer behaviour in light of modern consumer society.
- **Chapter 5 : On Awareness** was written in collaboration with a fellow master student. It explores the ambiguous concept of awareness with an aim of providing an appropriate definition. The chapter thus present two definitions of awareness from literature, situational and self, before we present our own definition of consumer awareness which is then what we refer to when talking about awareness.
- **Chapter 6 : Theory as a shaping tool** shows how the applied theory has been actively used throughout this thesis, as an internal component and key element for research. My research question is also presented in this chapter.

- **Chapter 7 : Design, consumption and consumer behaviour** elaborates on the design approach known as Design for Sustainable Consumer Behaviour, which facilitate and systematize the usage of behavioural intervention strategies, such as Design for Awareness. Furthermore this chapter provides a justification for choosing Design for Awareness as my design approach.
- **Chapter 8 : Research approach** shortly presents the reasons and goal of this research. The chapter also presents and justifies my chosen methodological approach.
- **Chapter 9 : Methods** provide an overview and elaborates on the methods used to gather data. It also presents, more in depth, the structure and implementation of the two types of interviews conducted before looking at ethical considerations. Lastly the chapter shows how the data gathering process was influenced by the theory of Design for Sustainable Consumer Behaviour.
- **Chapter 10 : Findings and Analysis** will present the relevant empirical data gathered.
- **Chapter 11 : Discussion** is where I bring together and present a discussion of my theoretical framework and empirical data.
- **Chapter 12 : Reflections** on the conducted study are presented in this chapter.
- **Chapter 13 : Concluding remarks** is the concluding chapter and seeks to end the study by summarizing the findings to answer the research question. provides a "what is a conclusion". The study's contributions is also presented here, alongside with suggestions for further work.

Chapter 2

Background

In this chapter, the primary focus will be introducing and becoming more familiar with essential topics and concepts for this particular thesis. This will allow me to explain the background for my research as well as elaborate on what is already known.

2.1 SMART | Mobile Phones

First I want to elaborate on the project that has been the foundation for this thesis. As mentioned in the motivational chapter, the SMART-project investigates “what prevents and promotes sustainable development within planetary boundaries with the aim of achieving policy coherence for development” (Home- Smart). The project started in March 2016 and consists of a large international team of scholars, but is based at the University of Oslo.

The specific project, Smart | Mobile Phones, already has several related articles and ongoing studies. Taking a life-cycle approach, these articles present challenges in manufacturing, design, the mining of minerals, repair, recycle and discarding of mobile phones. Even though these are undoubtedly relevant topics, I find that the articles tend to fall short on emphasizing the importance of topics such as consumer influence and actions.

2.2 Introducing Obsolescence

2.2.1 Origin and Use

Obsolescence is defined as the process of being or becoming something that is no longer useful or in production, the condition of being obsolete,

something that is no longer useful or in production. The word is of Latin origin, based on two components: the verb *'soleo'*, meaning *'to be in use'*, and *'ob-'*, meaning *'away'*, turning the word in an opposite direction (Cooper, 2016, p. 41). The early usage, according to Cooper (2016), generally referred to clothing that was dirty or worn out. In our modern world obsolescence of products occurs in several ways due to its many contributors; technological change, economic forms, fashion trends, issues of repair, maintenance, durability and consumer expectations (Cooper, 2016, p. 41). What makes obsolescence so relevant to this thesis is that it is especially prevalent when involving (fast-changing) technologies, such as the mobile phone.

With advancements in technology, manufacturing companies have been able to develop products concurrently. Faster production processes lead to faster product replacements, which results in increased consumption and thus increased revenue for manufacturers who are additionally ensuring long-term sales. Marketing professionals, on their hand, argue that obsolescence is a natural result of competitive and technological forces in a free market (Aladeojebi, 2013, p. 1504), and that it boosts competition and, allows for technological advances (Valant, 2016, p. 2). The premature obsolescence of consumer goods may exacerbate adverse effects of our culture of consumption such as the excessive use of natural resources, environmental damage, etc., (Valant, 2016, p. 3).

2.2.2 Exploring obsolescence

In "The story of stuff," from 2009, Annie Leonard reveals that the average North American does not only consume, on average, twice as much as they did 50 years ago but that they also trash and replace 99% of what they buy within six months (Leonard, 2009). It is thus interesting to reference Rojek (2004, p. 306), and his question regarding consumers goods, and if *"their fast aging, rapid loss of allure and seductive power is perhaps their main attraction?"*

In modern society, having what is 'in style' or 'in fashion' has almost become a consumer sport. As we continue to embrace a newer designs, consumers are falsely manipulated through the design approach charmingly known as *"design for the dump"*. Obsolescence of various types is ultimately handing the power over to manufacturers (Leonard, 2009).

Obsolescence is mostly viewed with suspicion, as many people believe that economic motives such as the drive for profit have led manufacturing companies to the manipulation of product life-spans, at the expense of consumers and the environment (Cooper, 2016). However, as supply

outweighs demand, consumers are not able to purchase all produced products. The only way of solving this, from a manufacturer's point of view, is to produce goods with short economic life and durability, as increased durability is a drag on profit (Aladeojebi, 2013, p. 1504).

While one should not blindly assume that all products are marketed according to the philosophy of Brooks Stevens, where consumers are encouraged by design to own something new (more about this in section 3.1.4), or that all industry is engaged in a conspiracy of obsolescence (Cooper, 2016, p. 43), manufacturers will almost certainly always try to maximize their sales and profit.

2.2.3 Our Culture of Consumption

"In the end, "the natural world has much more attractive features than even a top-of-the-range consumer good" (Weihe, Schally, & Griesshammer, 2016, p. 9)."

The vast majority of research articles I have read about obsolescence has focused on convincing consumers that it is an encouraging design approach built in by manufacturing companies. While there is ample and robust evidence that this is the case, it is only one part of it. Thus, it becomes increasingly important to keep a critical mind.

The Urban Myth of Obsolescence

Professor Rainer Griesshammer, claims that the urban myth of obsolescence is misleading and distracting both humans and consumers from the real problem, which he identifies as *"rampant consumerism"* (Weihe et al., 2016). Nothing lasts forever, consumer are aware of this. However, they are consciously or unconsciously giving manufacturer's authorization to push the boundaries of obsolescence to the extreme through their continual consumption. Weihe et al. (2016, p. 4) adds that as consumers are immensely exposed to *"aggressive advertisements, discounts, dodgy contracts, and a constant array of new functions, [...] it seems like [they] have their own built-in switch to turn off their critical faculties"*. Most consumers' purchases are motivated by emotions and the desire for an upgrade, a desire that manufacturers and service providers are only too happy to encourage (Weihe et al., 2016, p. 8).

The blame game

When misfortune happens, people often want to put the blame on others, as blaming someone else is much easier than accepting responsibility (Whitbourne, 2015). Additionally, it is an excellent defense mechanism. Assigning blame to someone or something helps you preserve your sense of self-esteem by avoiding awareness of your own flaws or failings, and blame “gives” you the opportunity to ignore your contributions to a bad situation. Further, those who do not know the consequences of their unintended actions typically do not become responsible or held accountable for those consequences. One could say that ignorance, in a way, “gives” freedom from responsibility, but only if or when the ignorance is reasonable and not intentional (Whitbourne, 2015, p. 34).

So, in regards to obsolescence, who is to blame and who should take action? Through their market power and decisive behaviour, consumers can stimulate demand for better products and services and support innovative technologies and business solutions (Weihe et al., 2016, p. 5). Should they refuse to buy cheap appliances that develop faults quickly? Should manufacturers offer high-quality, durable products? Alternatively, should policy-makers set minimum product standards? From the discussion in section 2.2.3, the answer is simple; it is all of the above!

Policy-makers must put the right conditions in place and create incentives for longer product use, [...] consumers should be aware, for example, of which shutdown functions have been built in as safety features, [...] which parts are prone to wear and tear, under which conditions they are likely to develop a fault, and how often the device should be serviced. [Additionally], manufacturers should clearly state the limits to use.

– Weihe et al. (2016)

2.3 The case of the Mobile Phone

One technological device that has been widely adopted and also diffused to an integral part of consumers everyday life, is the mobile phone. Despite initial consumer apprehension, we came to rely on the device over time (Quan-Haase, 2015, p. 94). Since the mobile phone became embedded in existing social norms and practices, its emergence has had a dramatic and

lasting impact on, e.g., our communication practices. According to the latest figures from Statista, the number of mobile phone users in the world will reach 4.9 billion in 2018 (Statista, 2018b). The growth is very much driven by increasing popularity of smartphone usage. Quickly reaching 2.5 billion users worldwide (Statista, 2017), the number indicates that over half of all mobile phone users will be smartphone users.

From the numbers presented, there is no doubt that there have been rapid changes in mobile phone technology throughout the last decades. Connected to these changes are incredible advancements, which all are important to why there has been a tremendous growth regarding the number of mobile phones in circulation, and why it is still an ever-increasing number.

To gain a better understanding of the significance of mobile phones in society, an overview of the development of the related industry and emergence of the mobile phone is needed. The next section will thus highlight the evolution of the device, from initial telephone prototypes to the modern smartphone. Before continuing, we also find it relevant to inform about some self-determined specifications. The focus of our studies will be aimed at smartphones as it is the mobile phone of choice by the vast majority of (mobile phone) consumers. Secondly, we find it relevant to inform that due to the rapid development of mobile phone technology, our presentation is based on the current landscape, as of autumn 2017 until spring 2018. Lastly, we want to specify that our planned studies and the following observations will be based on those of western societies.

2.3.1 The Telephone

Much innovation has occurred in the realm of telecommunications since the invention of the telegraph during the eighteenth century. Since Alexander Graham Bell was awarded the patent of the first prototype (an apparatus for transmitting vocal or other sounds electrically), the telephone has undergone many transformations (Johnsen, Olsen, & Øverby, n.d.). The initial model was very similar to the telegraph, the primary difference being that Bell's telephone design could transmit true sound. The following years Bell continued to improve upon his design and after a few years, he created the precursor to modern phones (Johnsen et al., n.d.).

2.3.2 The Mobile Phone

"A mobile phone is a wireless hand held device that allows users to make calls and send text messages, among other features"

– Technopedia (2018)

In 1956, the very exclusive car-telephone, manufactured by TeliaSonera and Ericsson, entered the market (see figure 2.1) (“Facts about the Mobile. A Journey through Time.” 2010). Though it was very fashionable and sought after, the device was not a consumer-friendly commodity. First of all, as indicated by the name, the telephone was meant to be held in the car as it was not a consumer-friendly commodity. First of all, with a total weight of 40 kilos, it was not at all very “mobile”. Secondly, the cost of the device was almost as much as the car itself, corresponding to today’s value of approximately NOK 66 000. Lastly, battery consumption was so extensive that the car batteries hardly could meet the device demands, and after a few phone calls the car batteries would require recharging (“Facts about the Mobile. A Journey through Time.” 2010).



Figure 2.1: The exclusive car-telephone manufactured by TeliaSonera and Ericsson.
Picture taken from “Car Phone” (2018)

In 1973, the general manager of Motorola’s system division, Martin Cooper, dialed his way into history (Woyke, 2014). He made the first ever phone call from a hand held mobile phone (Goodwiin, 2017), and with this call, the modern mobile industry was born. The revolutionary device, named DynaTAC, had a long antenna, thin body, and a protruding bottom “lip”, with a total weight of almost 0,8 kilos (see figure 2.2). Although this represented a considerable advancement, the DynaTAC was still pricey, quite heavy and with inadequate performance. In other words, not very sleek by current standards (Woyke, 2014, p. 1).

Despite its rapid evolution, the mobile phone did not become a standard commodity before the end of the 1990s (Goodwiin, 2017).

2.3.3 The Smartphone

“Generally speaking, a smartphone distinguishes itself from a cellphone by running on an open operating system that can host applications (Apps) written by outside developers”



Figure 2.2: DynaTAC, as manufactured by Motorola. Picture taken from oldmanbitter (2009)

– Woyke (2014, p. 2)

A smartphone is an advanced mobile unit, which combines functionalities from a mobile phone and a computer together in an Operating System (OS) (Øverby, 2017). An OS is software that makes the smartphone able to install and run applications and programs, giving the smartphone computing capabilities similar to a computer (Rouse, 2018).

The term, smartphone, was initially used to identify the then-new models of mobile phones that could facilitate data access as well as processing with significant computing power (Zheng & Ni, 2010, p. 4). There is no absolute common consensus about the origin of the smartphone (Woyke, 2014, p. 2), however, in 2007, when Apple's iPhone was presented at the Macworld conference, it was regarded by many as the start of the smartphone era. This new device broke ground for overall design and finish (Goodwiin, 2017), by introducing sleek multi-touch screen interfaces and virtual keyboards, along with the popularization of applications (Woyke, 2014). This came to be the starting point of how we know mobile phones to be today.

Smartphones in Modern Society

As the desire for the above-mentioned features became increasingly evident, the (consumer) demand increased equivalently. Today, the term

smartphone is not likely to be used as identification of one specific type of phone. Rather, "smartphone" has virtually replaced the term "mobile phone," or at the least been made into an accepted, more collective, and frequently used synonym. Smartphones have been widely embraced by the mass market, and hence the acquisition of one is now the preferred choice among the vast majority of consumers. Especially in western societies, smartphones are now the standard and not the exception, and we are confident that smartphones are here to stay. They are continually evolving, getting even more advanced and will continue to do so throughout our studies.

Why are We Interested in Smartphones?

As mentioned, the number of smartphone users is estimated to reach an astounding 2.5 billion in 2018. However, the average lifespan of a mobile phone comes to an end at approximately 12 months (Mooallem, 2008). According to statistics from 2016, there was 2,1 billion smartphone users worldwide (Statista, 2017), and global annual smartphone sales amounted to, 1,5 billion (Statista, 2018b). More importantly our study showed that over half of the smartphone users acquired a new mobile phone that year. Based on the historic sales trajectory, we assume that these numbers have increased even further since these statistics were published. In addition, we believe that consumers should avoid distancing themselves from what makes a mobile phone by only interacting with the finished product. Despite the fact that mobile phones arguably are one of the most central objects in people's lives at this point in time, the majority do not know much about them or the impact they have on their lives and habits.

By making it difficult for consumers to explore the inside of their phones, for example in cases of repair, smartphone manufacturers, such as Apple, Samsung, Huawei, etc., are protecting themselves from warranty and injury claims (Woyke, 2014, p. 99). For example, Apple denies consumers their warranty rights if they do not choose to have their Apple device repaired at an authorized repair centre.

Due to the strict policies of Apple, most consumers distance themselves from their devices, not knowing where they come from, what they are made of, or how to fix them if they malfunction. Thus, some argue if we can even say that as consumers, have complete ownership of their devices.

Additionally, the rapid changes and following advancements in both aesthetics and functionality within mobile phone technology leads to the continuous introduction of new mobile phones. As the smartphone mar-

ket becomes increasingly saturated, product updates and replacements of new phones will be the market's main driving force ("Top Five Best-Selling Smartphone Brands," 2017). This internal competition among manufacturers goes beyond consumers who are continuously convinced that they "need" a new device and thus keep up their unsustainable/unconscious pattern of consumption.

Part I

Theory

Chapter 3

On Obsolescence

3.1 The early days

It is surprisingly common for people who encounter 'obsolescence' as a standalone term to assume that the word 'planned' has either been omitted as a prefix or that it is merely an understood component. However, this is not the always case. In fact, there are various more recent and possible cases of obsolescence which *"makes it remain extremely hard to prove that the obsolescence is planned"* (Valant, 2016, p.3).

In their briefing "Planned obsolescence: exploring the issue," Valant (2016), turn their focus to the choice of words, highlighting that 'planned' does, in fact, imply an intentional goal of a premature "end-of-life" state, and thus question if the term is too provocative or negatively loaded. This was, nevertheless, how the history of obsolescence started.

3.1.1 The Phoebus Cartel

Planned obsolescence (PO) is hardly a new term. In fact, the concept initially emerged in the 1920s. The first known case of the practice can be traced back to 1924 and the founding of the Phoebus cartel. The cartel was in control of the manufacturing and sales of incandescent light bulbs. Being made up of representatives from all major light-bulb manufacturers made them able to maintain prices at a high level as well as restrict their competition. During their short domination, the cartel members engineered a shorter-lived light bulb. While it might seem like an absurd measure, by early 1925, not only had the lifespan of the average light bulb been reduced from about 1500-2000 hours to around 1000 hours, but the prices had also increased ("The Light Bulb Conspiracy - Extended Version - YouTube," 2016). As a way of trying to rationalize their approach, cartel

members claimed that their bulbs were of higher quality and that they burned longer as well as brighter compared to their competitors. Today, decades after the cartel has broken up, Shelby Electric Company, who manufactured bulbs even before the Phoebus Cartel, has ironically become famous for the outstanding longevity of their bulbs. One particular bulb of theirs, which was installed in 1901, continues to shed light 24 hours a day in 2017.

Motivated by profit and not consumers best interest, the Phoebus cartel is known for giving life to the design strategy we now refer to as planned obsolescence. Even though they only got to enjoy their global reach for about a decade, their legacy was and still is an engineered shorter life-span for the incandescent light bulb (Valant, 2016, p.3).

3.1.2 Economic Chaos

Following the Great Depression (1929 - 1939) as well as World War II (1939 - 1945), governments all over the world experienced economic chaos.

The economic depression started in the United States after a significant stock market crash on October 29, 1929. It took only a few days before the markets value was close to halved (Billington & Reisegg, n.d.). The crash and loss of values led to a sudden reduction in consumption, and once the deflation set in, consumers were in distress. Staying away from the markets, literally, by withdrawing their cash and physically hiding their money, consumers believed they were avoiding further losses. Then, as prices dropped even lower, holding money became profitable, enabling consumers to get more than their worth. However, this contributed at the same time to an exacerbating drop in demand, leaving consumers paralyzed. The bitter irony was that while millions of people were deprived of a satisfactory standard of living, the warehouses of the world were overstuffed with surplus supplies.

3.1.3 Ending the Depression Through Planned Obsolescence

In his advisory paper, *Ending the Depression Through Planned Obsolescence*, London (1932) wrote about how to initiate the recovery of the economy. He saw the economic situation as an opportunity to revolutionize the economic thinking of the time, as he recognized that the essential economic problem was one of organizing buyers. Due to extreme poverty, people were holding on to their possessions for longer, waiting until the last possible bit of utility had been extracted. London called it "*disobeying the law of obsolescence*" and asked if the American people wanted to risk

their future on such "*continued planless, haphazard, fickle attitudes*" (London, 1932). It is applicable in any society; people who purchase commodities are crucial to balancing production with consumption, as well as to create a business. What London specifies in his paper is that "*the existing troubles are man-made, and the remedies must be man-conceived and man-executed*". Thus, arguing in favor of policies that facilitate planned obsolescence, he proposes two methods. One regarding production and the other consumption. The former is to "*tax the man who holds old things for a longer time than originally allotted*" (London, 1932), and the latter suggests that all commodities should have a life-span, just like humans. With these methods adopted, there should be no overproduction because the two would be regulated and adjusted to each other.

"If we can afford to sink ships, that cost millions of dollars to construct, merely for the purpose of giving target practice to the gunner, then surely we can afford to destroy other obsolete and useless products in order to give work to millions and pull the country out of the dire catastrophe in which it is now wallowing" London (1932)

3.1.4 "Instilling in the buyer the desire to own"

Despite London's advisory paper, the most commonly cited early reference to the term 'planned obsolescence' is cited back to Brooks Stevens (Cooper, 2016, p.42). In 1954, the American industrial designer gallantly defined the term as *instilling in the buyer the desire to own something a little newer, a little better, a little sooner than is necessary*. I do not believe that this cited definition of the term should be understood as a way to deliberately shorten a product's life-span by creating products that easily break and thus needs to be replaced. Rather, it is a design approach, encouraging designers to always design their next product a little sleeker and better looking, so that consumers would want something new. Hence, planned obsolescence for Stevens was simply psychological as it seemingly grew out of 'desires' and 'wants' (Rojek, 2004, p.297). This also indicates the evolution from obsolescence in its earliest form, as defined by Bernard London, meaning *to wear out*, into Brooks' definition, which is more relate ble to perceived obsolescence, influencing consumer spending.

"With mass production rapidly expanding together with the growth prosperity of the 1950's, the modern consumer society appeared, encouraging the 'consume and throw away' culture (Valant, 2016, p.3)"

Over five decades later, the concepts of planned- and perceived obsolescence are continuously spiraling out of control. While obsolescence

was once an aid for an economy that needed healing, removing potential for economic stagnation, there never was any serious overall decline in consumer buying power. Hence, modern consumers are still encouraged to shop for fun, not need ("The Light Bulb Conspiracy - Extended Version - YouTube," 2016).

"Economic growth is no longer an endeavour with a set objective and a finishing line, but a continuous self-propelling process with no end in sight [...]" (Rojek, 2004, p.298)"

3.2 A Wealth of Information

Gathering information for a thesis, one gets caught up in the exciting literature, always wanting, seeking and acquiring more knowledge. As I narrowed down my research question, I needed to narrow down my sources of information. I decided to base my further research on the information I found most relevant and applicable to the problem area and research question of this thesis.

With the information I had gathered, I found it especially troublesome to recognize the distinctions between various types of obsolescence. A wide range of categorizations of obsolescence is possible. For each research article I read, or documentary I saw, a new and formerly unknown category of obsolescence was presented. Furthermore, it was not completely intuitive which of the given categorizations of obsolescence were different, and which were, in fact, overlapping.

The European Parliament Research Service (EPRS) (Valant, 2016) simply categorized obsolescence by *planned, indirect, incompatibility and style*. Aladeojebi (2013) draws attention to two mechanisms of planned obsolescence, namely *physical and technical* where the former is categorized into three, self-determined, subcategories called limited functional life design, design for limited repair and design aesthetics. On a last note, he also introduces *technical obsolescence* without much explanation as to where it fits within his classification. Then, as Cooper (2016, p.16) categorizes obsolescence by *planned, social, economic, technological and aesthetic* one can understand and agree with his statement that *"there is no definitive typology of the causes of obsolescence"* as they are complex and interrelated.

In the sections to come, I will focus on referencing chosen literature, reviewing the presented types of obsolescence. In the coming sections, I will provide a summary of the various types, looking at similarities and differences, explaining which I find the most relevant and applicable to

the thesis. Lastly, I will provide illustrations to show which categories of obsolescence are in fact overlapping.

3.3 A Review

The 2016, EPRS briefing, *“Planned obsolescence: Exploring the issue”* reviews and reflects upon which classifications of obsolescence exists. They include, of course, *planned obsolescence*, but also *indirect-*, *incompatibility-*, *style-* and the more general classification of *product obsolescence*. The article then elaborates on the respective classifications;

- **Planned obsolescence** is initially described as *“the intentional production of goods and services with short economic and functional lives, stimulating or even forcing the consumers to repeat purchases too frequently”* as well as *“designing a product to have a shorter life or in such a way that it functions only a limited number of operations”*.
- **Indirect obsolescence** *“occurs because the component required for repair is unobtainable or it is not practical or worthwhile repairing the product”*, while
- **Incompatibility obsolescence** is *“the case when tablets or personal computers cannot run efficiently after successive software updates on the operating system”*.
- **Style obsolescence** typically the most self-explanatory. This classification is all about consumer vanity and wants as it is, for example, related to *“marketing campaigns that can, for instance lead to the replacement of perfectly functional mobile phones”*.
- Lastly, **Product obsolescence**, *“it can be driven by fashion and new design as well as technological developments”*.

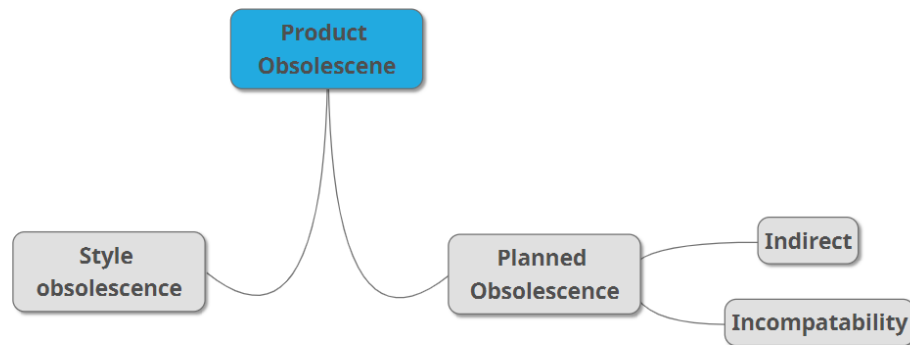


Figure 3.1: Categories of obsolescence, based on literature from Valant (2016)

Aladeojebi's article on "Planned obsolescence" from 2013, presents classifications of obsolescence such as technical, technology and physical.

- **Technical obsolescence** is one of two mechanisms for planned obsolescence presented in the paper. It *"is when producers introduce new product to replace the existing one"* (Aladeojebi, 2013, p.1504). In other words, consumers are not "forced" to change or discard their current product/device, as it is most likely still fully functional.
- **Technology obsolescence** is not categorized within planned obsolescence in this article. It is *"achieved through design for enhancement"*, concerned with regular technology upgrades, often due to technological advancements. Examples include the conversion from VHS to DVD. The DVD entered the video market at the beginning of year 2000. Within the second half of the decade, VHS had disappeared entirely.
- **Physical obsolescence** is the second mechanism fostering planned obsolescence, but the only one with its own subcategories. The overall purpose is to *"intentionally shorten a product's usable life"* (Aladeojebi, 2013, p.1504). There are several subcategories of physical obsolescence, but the article by Aladeojebi, 2013, focused on the "three major ones". **Limited functional life design** is *"the process whereby producers design products to deliberately last for a definite period of time"*. **Design for limited repair** concerns *"items that are difficult to repair as the high price of repair discourages consumers from repairing and they rather replace their product instead"*. Lastly, **Design aesthetics**, which leads to abridged satisfaction, refers to products that are *"designed to wear and tear easily"* and which are designed to look old

as soon as a newer version gets to the market.

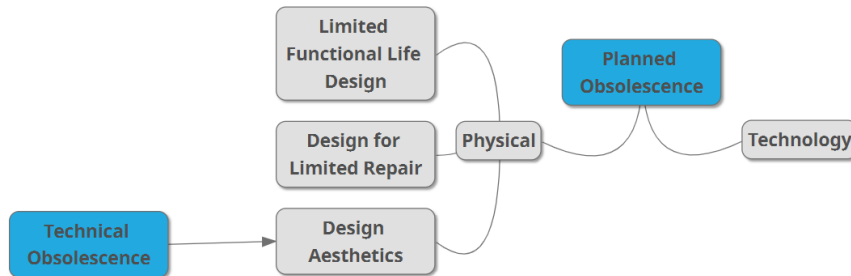


Figure 3.2: Categories of obsolescence, based on literature from Aladeojebi (2013)

Lastly, the book “Longer Lasting Products: Alternatives to the Throw-away society” by (Cooper, 2016) identified even more types of obsolescence, referring to them as “modes”. Among those who are not yet presented, or otherwise presented with a different name, are: *social-, economic-, technological-, and aesthetic obsolescence*.

- **Social obsolescence** is a mode with two components. First is when *“societies, nationally or globally, stop doing something”* which hopefully can soon be related to a subject of topical interest, namely the use of plastic. Second component, *“can be identified when laws or voluntary standards are issued and adopted, in order to create or maintain healthy social practices [...]”*, like when Norway banned smoking inside public premises.
- **Economic obsolescence** *“commonly occurs when repair, maintenance, reuse or upgrade is too costly to be justified by the manufacturer or the consumer”*.
- **technological obsolescence**, which is identified as (perhaps) the most consistent mode of obsolescence in recent years. *“It occurs when a functioning product is made obsolete by a newer one due to technological change”*.
- And **Aesthetic obsolescence**, which is all about changing fashion. *“Fashion usually carries with it an aesthetic or style that, by definition, will be transient: what is ‘in fashion’ will inevitably one day be ‘out of fashion’”*.



Figure 3.3: Categories of obsolescence, based on literature from Cooper (2016)

Lastly, although not presented with the same name in the articles mentioned above, **Perceived obsolescence**, is about fashion and trends. By making (minor) changes to a product's appearance, manufacturers effortlessly convince consumers that they "need" to discard and replace the functional products they already possess. Advertisement and media play a particularly prominent role in perceived obsolescence, which will be addressed in chapters to come.

3.4 Categorization

The similarities and differences between the range of types of obsolescence, their interrelations, and overlap, is of interest for the continued study.

The different types of obsolescence which have been explored, are all founded in research. Hence, one can disagree on the definitions or its importance, but there is no denying their existence. By recognizing their common characteristics and traits, it will be easier to get an overview, and hence create appropriate groupings for further research.

3.4.1 Product

As product obsolescence includes style/fashion and new design as well as technological developments, I believe that the EPRS considered it more of a general "umbrella term," with the intention of including other types of obsolescence.

3.4.2 Planned

The only type of obsolescence the authors of the articles stay true to is planned obsolescence. Although the EPRS briefing does not want to define this particular type, the briefing provides a corresponding description in its place. It highlights design features that do not allow repair, upgradability or interoperability with other devices, programmed failure of a device after limited usage, unavailability of spare parts and high repair costs. Last up is marketing strategies pushing consumers to buy new products and thus,

replace existing, still functional ones to stay in fashion (Valant, 2016, p.4). The remaining two articles are more confident. Their provided definitions agree upon the act of intentionally shortening a product's usable life (Aladeojebi, 2013; Cooper, 2016).

3.4.3 Limited Repair, Indirect or Economic

As the majority of repair businesses have been in decline for decades, what was previously a common practice, has now almost disappeared. Design for limited repair is quite similar to what Valant (2016) refers to as indirect, and what Cooper (2016) refers to as economic obsolescence, also concerned with high repair costs and seemingly unobtainable parts. However, if we think about it, when the parts needed to repair a mobile phone are unobtainable, it is likely that this is due to technical obsolescence and the introduction of newer products. It could also be that planned obsolescence by manufacturers keeps them unobtainable. They do not want consumers to firstly, repair parts themselves, but rather pay for repair in a certified repair shop and. Secondly, if repair is not an option due to high cost, they want consumer to purchase a new device.

3.4.4 Design Aesthetics, Aesthetics, Perceived or Style

Aladeojebi's definition of design aesthetics is more or less equivalent to the EPRS' style obsolescence, as well as in Cooper's aesthetic obsolescence. Looking again at the categories, they all come very close to the definition of perceived obsolescence.

3.4.5 Technological, Technical, Perceived or Technology

Lastly, the interrelation between technological-, technical- and technology obsolescence. While technological obsolescence only seems to include technological changes in a product specifically, technical obsolescence is used for an entirely new product, regardless of changes. Hence, I propose that technical obsolescence will be the overarching term for the two as it is to my understanding that it is, in both cases, voluntary for the consumers to act on the release of this new product.

However, and despite the degree of voluntary nature, both types affect the satisfaction of the modern consumer, who desires the newer version with the updated functionality. The already acquired product, which once had as much allure and seductive power as its coming successor, is now perceived as a bore (Princen, Maniates, & Conca, 2002). Consumer

practice in modern society, as I will come back to, is often characterized by social comparison, promoting social value, and identity as well as self-image. Put simply, until the upcoming discussions; not owning the newest model might be frowned upon by peers. This makes the association with perceived obsolescence quite clear.

Additionally, articles state that manufacturers are carefully planning new product releases.

As for technology obsolescence, exemplified with the advancement from VHS to DVD, can be related to technical (including technological) obsolescence, and hence also perceived obsolescence. Here is why; as DVD's were widely adopted, consumers were pressured into following the crowd. Eventually, everyone had to replace their VHS, regardless, as they went off-market. Firstly, if everyone else has a DVD player, you would want one too. Secondly, with the replacement comes the purchase of a new player, additional parts, as well as the repurchase of the actual movies, now in DVD format.

3.4.6 Perceived

On the subject of perceived obsolescence, a product is often rendered obsolete by perception rather than functions. As designers tweak the styling of various products consumers come to experience a decrease in the perceived desirability of their own “unfashionable” items and hence, purchase new products more frequently. It is all about consumers indulging in their wants and desires. Much like PO, perceived obsolescence is about designing products to only last a certain amount of time. The significant difference between the two is that while PO makes the product somewhat unusable, perceived obsolescence work purely on a psychological level (Bloch, 2009).

3.5 Bringing the Categories Together

Due to the close interconnections within the types of obsolescence found in literature, I do not see the need for seeking further knowledge about additional categories. Although I should remark, that that the sources of information I have used, recognize that there are more classifications of obsolescence in addition to the ones included in their respective papers. Aladeojebi (2013, p.1504), informs that *there are several types of physical obsolescence [...]*, while the briefing from Valant (2016, p. 3), simply state that *other classifications of obsolescence also exists*. Cooper (2016, p.17) also

recognizes this, as previously cited. However, they all have a chosen focus and review the types of obsolescence that are most relevant and applicable to the topics they present.

Thus, following the review and discussion on obsolescence from the literature, I decided to look at the respective similarities presented and bring them together based on these. The outcome is the three all-embracing categories, presented below:

- **Product obsolescence:** As an umbrella term for the other two main categories.
- **Planned obsolescence:** Including technical, technological, technology, design for limited repair, indirect, economic, limited functional life design and incompatibility.
- **Perceived obsolescence:** Including style, design aesthetics, aesthetic and social.

In other words, when discussing product obsolescence I will be referring to , as a standalone term. As for planned obsolescence, it will entail the accompanying categories, as they all fit well within the combined definitions of planned obsolescence; *Designing a product to have a shorter life or so that it functions only a limited number of operations, and the act of intentionally shortening a product's usable life.* The same applies for perceived obsolescence and its combined definition; *Making (minor) changes to a product's appearance so that consumers are convinced they need to discard and replace the functional products they already possess.*

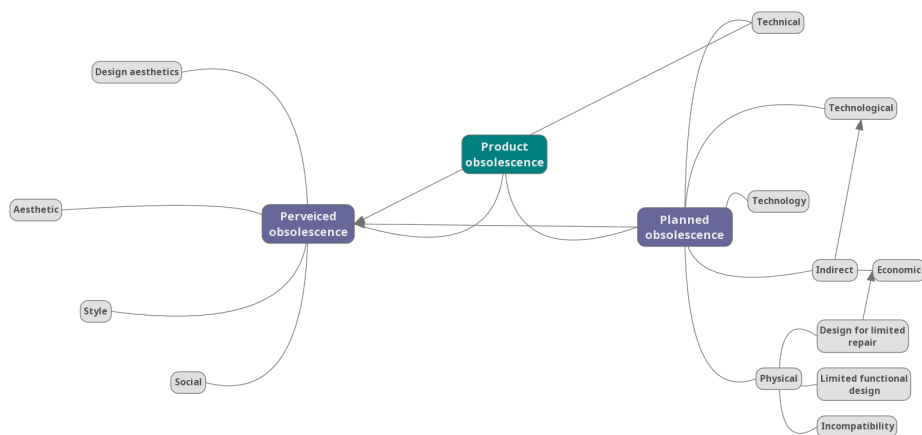


Figure 3.4: Chosen categories of obsolescence, based on literature findings from Valant (2016), Aladeojebe (2013) and Cooper (2016)

Chapter 4

On Consumption

A large body of economic literature exists on consumer theory, but traditionally its analytic goal is to *"better estimate demand curves, not to ask whether and how consumption patterns contribute to or solve social and environmental problems"* (Princen et al., 2002, p.9).

As I am not a student of economy, my focus has not been on exploring the related economic theories in depth. However, as discussed, obsolescence is a 'built-in' part of consumption. I find it relevant to elaborate, to some extent, on its theories and their importance. Additionally, I want to emphasize that I will not be looking at cases of inadequate consumption, such as poverty. Firstly because I am looking at mobile phone consumption in western societies, and secondly because obsolescence is the result of increased consumption in our western world.

Exploring theories of consumption and their importance in relation to my particular case thus forms a central part of my research. I will not extensively elaborate on all prevailing economic theories, but as the "umbrella" of this thesis is to look at consumption of mobile phones, it is beneficial to explore the concept with an interdisciplinary lens, acquiring knowledge and insight from the social sciences and humanities.

I attended a course, at the Centre for Development and the Environment, called *"Consumption, sustainability and Social Change"* with the aim of gaining in-depth knowledge about the topic of consumption. Traditionally, theories and definitions of consumption have been recognized as economic activities, independent of social and material contributions. During the course these theories were challenged and questioned.

As the course unfolded I came to realize that in order to fully understand consumption, it needs to be related to economic systems, social relations, cultural practices as well as the material world (Wilhite,

2017). Which the concept is inevitably embedded in. The course definition of consumption, and the definition on which I base my research, is therefore *“the acquisition and use of any product and/or services”*, and further conceptualized through the working definition presented by Campbell (1995, p. 102), whom specifies ‘acquisition’ as *“the involvement of the selection, purchase, use, maintenance, repair, and disposal of any product and/or service”*. Applying this, the definition of consumption entails a more complex variation of elements, aspects and components that are all equally important to consider.

Additionally, defining who is a consumer is valuable for further reading. We are all consumers in the literal sense of the term, as humans begin consuming in the very moment they enter the world (Jaswal, 2014, p. 340). In relation to economics, most are familiar with a consumer as an individual who consumes goods and services available in the market. The simple definition is common, but in need of some additional specifications. In conclusion, *any individual who purchases goods and services from the market for his/her personal (end-) use is per definition a consumer* (“Consumer Meaning in the Cambridge English Dictionary,” 2018).

4.1 Economic Theories of Consumption and Consumer Behaviour

Traditionally, higher product demand and consumption levels has been viewed as a central measure of an economy’s productive success and consumer satisfaction. The idea, and undeviating focus within economics has been that consumption is *“predominantly determined by the maximization of utility subject to the prevailing budget and price constraints”* (Fine & Leopold, 1993, p.47). In other words, following the prevailing economic theories one should assume that only prices and income affects consumption, as it does not provide adjustments for treating the behaviour of the individual consumer. Summarized briefly by Ackerman (1997, p. 651), the conventional economic theory of consumer behaviour assumes that:

Consumers come to the market with well-defined, insatiable desires for private goods and services; [and that these] desires are not affected by social interactions, culture, economic institutions, or the consumption choices or well-being of others. Only prices, incomes, and personal tastes affect consumption and since tastes are exogenous to neoclassical economics, there is little point in talking about anything but prices and incomes.

With support from articles by Princen et al., 2002, p.11, Ackerman (1997) further elaborates on the three, fundamental assumptions in the theory of consumption:

- **Asocial Individualism:** Consumer desires and preferences are exogenous; they are not affected by social or economic institutions, interactions with others, or observation of the behavior of others.
- **Insatiability:** It is human to have a multiplicity of insatiable material desires; the only economically meaningful forms of individual satisfaction result from more consumption.
- **Commodity Orientation:** Consumer preferences consist of well-informed desires for specific goods and services available on the market.

The following sections will not provide extensive information on the alternatives provided by economists. Rather I will examine the alternatives shortly to establish the needed comprehension.

4.1.1 Asocial Individualism

We are what we consume, in the sense that consumption is a critical aspect of giving meaning, status, and identity
– Princen et al. (2002, p.11)

Ackerman (1997, p. 652) and Princen et al. (2002, p. 11), emphasizes that “much of consumer behavior is fundamentally driven by desires for intangibles such as status” and that “consumer taste or choices are not exogenous or isolated acts of rational decision making”. Princen et al. (2002) also criticizes the asocial individual assumption, saying that as an economic activity, consumption, should be regarded as embedded in social relations.

Among the external influences affecting consumers, we find contextual forces such as advertisement, social norms, market powers, temptations, interactions with a preferenced network etc.

4.1.2 Insatiability

The view of human nature as an ensemble of insatiable desires for private consumption is as standard as it is silly
– Ackerman (1997, p.656)

Economist Tibor Scitovsky questioned which desires are in fact insatiable and which satisfactions are necessarily obtained through purchases

in the marketplace (Ackerman, 1997). His conclusion is that “*virtually all desires for comfort are satiable*” and that “*many of life’s most important satisfactions come from non-market activities [...] rather than from consumption of purchased goods and services*” (Ackerman, 1997, p.658).

4.1.3 Commodity Orientation

Consumers rarely want specific marketed goods per se.

– Ackerman (1997, p.663)

The essential activity of consumption is often not the actual selection, purchase or use of products. Rather it is the characteristics, experiences or satisfaction consumers obtain from goods. Campbell (1995) relates consumption to the result of “*mentalistic hedonism*”. Instead of having a desire for specific goods and/or services, whose values are not intrinsic, consumers see the pleasure and happiness resulting from consumption as a primary goal of human life.

"Consumer goods may serve to fulfill a wide range of personal and social functions. Fairly obviously, they commonly serve to satisfy needs or indulge wants and desires. In addition they may serve to compensate the individual for feelings of inferiority, insecurity or loss, or to symbolize achievement, success or power..." Campbell (1995, p.111)

4.2 Strengths and Weaknesses

Trying now to briefly summarize and make clear some of what the economic theory of consumption does well, I have collected some of the mentioned strengths and weaknesses below.

Based on the simplified assumption of a ‘rational consumer’ who is self-interested, autonomous, well-informed and concerned with utility maximization, the prevailing economic theory of consumption will be able to estimate demand curves more precisely. Indeed, simplifying and limiting the explanatory variables that can be measured, increases the possibility of producing a more rigorous analysis. However, it distances itself from social sciences, not portraying the correct behaviour of the individual consumer, who is inevitably affected and influenced by social interactions and/or contextual forces.

In regard to my case of the mobile phone, the prevailing theories of consumption also comes short. As a ‘rational consumer’ acquiring a

mobile phone, one should for example; not be pressured into buying the newest mobile device by peers or advertisement, not be tempted to do an impulsive purchase decision, not seek information from online review sites when gathering information prior to a purchase, should not purchase another mobile device before total end-of-life, and lastly one should acquire and select the mobile device which provides the greatest value possible from the least amount of money.

4.3 Toward a New Theory

Human nature is undoubtedly much more complex than what the three assumptions base themselves on. Prevailing economic theory explains a lot – but has made limited contributions to the theory of consumer behaviour, and leaves a great deal still unexplored (Princen et al., 2002). For example, by excluding the concerns of other social sciences, the theories and assumptions simplifies and limits the explanatory variables that can be measured (McNeill, 2017). This approach is what makes economic analysis rigorous and more easy to handle, however, it is perhaps more suitable for short-term changes. Rather, by welcoming other disciplines, one can obtain a broader core of more relevant behaviour and thus perhaps look into the basis for long-term changes.

4.4 Social Consumption

4.4.1 Consumer behaviour

The study of consumer behaviour is a relatively new field within the theory of consumption. In its early stages consumer behaviour emphasized the interaction between consumers and producers at the time of purchase. Today, most marketers recognize that consumer behaviour is an ongoing process. Thus the definition covers a lot of ground. Defined by Solomon, Russell-Bennett, and Previte (2012, p.3) consumer behaviour is *“the study of the processes involved when individuals or groups select, purchase, use or dispose of products, services, ideas or experiences to satisfy needs and desires”*. From this we understand that it is a highly interdisciplinary field, and that the study of consumer behaviour will indeed be shaped by many different perspectives, dependent on researcher’s diversity, experience and/or background as well as interest.

Additionally, since the field is inherently a part of economics, looking at what level of consumer behaviour the applied research field addresses is

interesting. Known as 'micro' and 'macro' consumer behavior, the former is the study of the individual consumer (see section 4.4.1), while the latter is the study of the consumer as a member of groups or of the larger society (Solomon et al., 2012, p.34).

Economic man and rational decision making

As previously discussed, in economic analyses consumption is conceived as transactions made by economically rational individuals. This rational individual, or more specifically, consumer, is in literature known as *Homo (o)Economicus* or *economic man*. The economic man is driven by self-interest and individual utility maximization. He is autonomous and, as discussed not influenced by others, but rather a well-informed individual who knows all his options and alternatives (McNeill, 2017). The behaviour theory of economic man is measurable, and determined by theory through predefined demands, like prices and income. The theory has been viewed and considered as an abstraction and formalization, which is the cost of a precise and uncompromising theory.

Social Man and Social Influences

Within the last decades, the growing importance of using interdisciplinary research approaches in an attempt of understanding the greater picture has been acknowledged. From this, research on consumption has become more interdisciplinary, with contributions from fields such as sociology and anthropology. As the study within these fields are concentrated on what makes us human, the aspects of humans, as well as the development and function of human society, their approach to the questions of consumption is to look at consumers social behaviour, in practice, as a part of a larger society.

Modern consumption is very much a social act

– Schor (1998, p. 152)

Consumer are human beings, and humans are inevitably social beings. We do not live isolated, autonomous lives. Firstly, looking at more general consumption, choices are heavily influenced by contextual social forces and are, in fact, very much dependent on, and shaped by long-standing practices (Princen et al., 2002, p.14). Secondly, looking at consumption at an individual level (although still a part of society), social man is supported

by Ackerman (1997) take on asocial individualism. Both Ackerman (1997) and Princen et al. (2002), recognizes that consumer behaviour and choices are a significant part of the individual's attempt to find meaning, status and identity, even though these consumption choices might not always be consciously used as a means of establishing identities.

Studies of economic and social concepts such as the peer effect and social modelling exemplifies the case. Peer effect relates to individual decision making with the aim of establishing links, particularly to peers (McNeill, 2017). While social modelling is the idea that in order to establish stronger links to others, individuals compare themselves and take into account the behaviour of others, preferably peers, and uses this as a base for further orientation.

Additionally, individuals are also prone to what Thaler and Sunstein (2008, p. 54) refers to as social influences. These come in two basic categories, involving namely information and peer pressure.

The first category is concerned with the fact that if multiple people do something or think something, like acquiring the newest smart phone released, or consider only the newest technology as satisfactory, it is human logic to believe that their actions or thoughts convey information about what might actually be best for you to do or think as well. Like when various consumers from around the world give an outstanding review of the newest iPhone model, iPhone X. The statements from consumers were indeed extraordinary with comments like "this feels like the future", "The best camera I've used on a smartphone" and "like magic" (Apple, 1.11.17). With these recommendations in mind it is understandable why consumers would want to buy the same device.

The second category concerns the commonly known case of peer pressure. If you care about what other people think about you, then you might go along with the crowd. In the innovative and changing world of technology, it becomes even more noticeable when consumers do not have the newest device. Peer pressure might get to the point where consumers experience embarrassment from owning mobile phones, which their peers consider outdated or wrong. Today, having a smartphone is an example peer pressure. Another interesting and related example is the purchase of products, including smartphones from Apple Inc. They do a great job of hyping up their products prior to release so that their products are as popular across the globe as they are across the age range of their loyal consumers. Which insinuates that consumers might additionally experience staying loyal to the Apple brand as a type of peer pressure.

An analysis done by Schor (1998, p. 150) reveals that, “*we fear we may be signalling that we are petty, cheap, or in an inferior economic position*”. Hence, as this is not a role most are comfortable with, the result is likely to be more frequent consumption of goods, such as a mobile phones, despite the fact that their current one might still be perfectly useful.

In the short yet stormy history of sociological approaches to consumer behavior, we can record a market shift from the category of ‘needs’ to that of ‘desires’, and from there (more recently, and ever more conspicuously) to ‘want’ (a momentary and volatile want, a wish with no history, impulse apparently appearing from nowhere and ageing/wilting/fading from the moment of birth)

– Rojek (2004, p.297)

Thorstein Veblen, an American economist and sociologist with Norwegian ancestors, was the first theorist to suggest that an act of consumption might carry such a distinct meaning in the form of “*messages*” about identity. Veblen is best known for his critique of asocial individualism in relation to the idea of conspicuous consumption, criticizing what he refers to as “*the leisure class*” (Stoltz, n.d.). A societal group that devours the riches of society and in which people imitate each other in the pursuit of status with the aim is to acquire products to promote one’s status on an individual level. Hence, instead focusing on necessities, consumers might acquire products that are ‘too expensive’ to achieve a higher social status or to keep up with the status they already have. In the culture of modern society, social man might feel pressure to show of material wealth. While addressing conspicuous consumption one can see also how the concept of utility maximization, a characteristic of the economic man, is no longer valid as a number of consumers often pay more for certain products even though cheaper alternatives exists.

4.4.2 Consumer Society

A *consumer society* is a society in which the buying and selling of goods and services is considered the most important social and economic activity (Nelson & Goodwin, 2008). Elaborating on the emergence of this society, Nelson and Goodwin (2008), remind us that looking back at history one will find patterns of consumption that are very different from those that exist today.

In modern times, consumption has become central to our everyday life, providing meaning and identity, making contemporary society a consumer society which far exceeds the prevailing economic thoughts of production (supply) and consumption (demand). Consumption continues to be a primary driving force of modern society, but what differs most from the consumption patterns today versus after e.g., the great depression is that consumption seem to exists for the sake of justifying production rather than having production being carried out for the sake of the economy. As exemplified on several occasions by Princen et al. (2002, p.5) "*consumption becomes sacrosanct*" in such a way that "*when production creates problems, such as pollution, the productive answer is to produce correctives such as scrubbers, filters, and detoxifiers*" (Princen et al., 2002, p.17), and "*if water supplies are tight, one must produce more water, not consume less*" (Princen et al., 2002, p.5).

4.5 Patterns of Behaviour

It is the consuming behaviour [...] and all the incentives and structural factors that compel such behaviour, which must change.

– Princen et al. (2002, p.10)

As humans, we are predictable as we perform practices and habits, making routine decisions. Such social factors might lead consumers to behave in similar or even identical ways (Fine & Leopold, 1993, p.50). However, the attitudes and behaviour of consumers can and will however change over time. These changes can come abruptly, and other times over the course of years.

It can be difficult to understand and explain the changing nature of consumer behaviour. Relating it to the domain of fashion, as it affects several, if not all, types of cultural phenomena, Solomon et al. (2012, p.32) elaborates on three perspectives regarding the origin and diffusion of fashion; *the psychological-, economical- and sociological factors*. The former relates to "anti"-conformity and includes the desires for variety, being able to express personal creativity. The second perspective, the economic model, approaches the model of supply and demand and states that consumers desire limited, high value commodities to display prosperity. Lastly, the sociology model focuses on a subculture's adoption of a commodity and its subsequent diffusion into society as a whole.

Much of the attention on consumption theory has previously been given to subjectivity, cognition, and reflexively (Whilhite, 2012, p. 88).

However, it is beneficial to include cognitive (thinking), emotional (feeling) and behavioural (actions) approaches to (understand) consumer behaviour, as consumer have practiced behaviour not explained in the typical economic theories of consumption.

Chapter 5

On Awareness

Being interested in the different issues that may occur in one or more phases of the life cycle of a mobile phone, we realized that there is a diversity of considerations to be taken. Depending on which topic and/or research objective we, individually, prioritize and the degree to which we make them our focus, our final design can vary wildly. Both our thesis' evolves around the mobile phone, we want to address the issues caused- or affected by, the traits of this device within the different phases throughout the mobile phone life-cycle. Phases such as extraction, design, development/production, and the use and disposal phase. Common for us both is that we wanted to aim our primary focus on consumers. The course "Technology Society Ethics" made us aware of a paradox where business seduces consumers with attractive buying experiences with the promise of improving their quality of life, while in reality the products and services actually constitute a threat to the very quality of life they advertise to improve (Srivastava & Pandey, 2016, p. 1). For example, many consumers are not aware of the fact that during the extraction phase there is an increasing use of scarce minerals. Also, the extraction itself is unfortunately often financed by child- and, forced labour in countries disrupted by war. Another example takes place within the use phase where the continuing introduction of devices leads to excessive consumption and thus product obsolescence.

The course curriculum made us aware of the complexity of the issues mentioned above. Thus, we decided that we wanted to contribute to heightened awareness of consumers, and particularly their awareness when it comes to selected issues within specific phases of a mobile phone's life cycle.

Due to variations in information gathered, it remained a challenge

to create an overall picture of awareness, which could be generalized. Thus, we concluded to make our own understanding of the concept of awareness, specifically targeted to the goals of our research. We would need to reinvent, to some extent, awareness from our own interpretation of the term, of what it is, how it works, and how it should be used. Including, also, characteristics from relevant literature, the goal of this chapter is to develop a descriptive theory of awareness for the purpose of creating an understanding of what awareness is.

5.1 Understanding Awareness

Defined by an online dictionary ("Definition of Awareness," 2018), awareness is *"the quality or state of being aware: knowledge and understanding that something is happening or exists"*. Aware as such, being defined as *"having or showing realization, perception, or knowledge"* ("Definition of Aware," 2018). From the two definitions we understand that the concept of awareness is relative, and that it can be related to both the internal as well as the external world of an individual.

"At its most basic, [awareness] is knowing what is going on what is happening around you and understanding what that information means to you now and in the future. As situations and environments become more complex, however, awareness becomes more noticeable"(Endsley, 2016; Gutwin & Greenberg, 1999, pp. 13, 9)

Our literature studies resulted in a large collection of information regarding consumer awareness in relation to e.g. consumer knowledge, behaviour, consciousness and practices. From this, we learned in its simplest form, awareness is about knowing what is going on around you. Thus, it is typically created, through the interaction between a human being and their environment. As environments are dynamic and change over time, awareness, as knowledge and understanding, must be maintained and kept up-to-date. This is done through continued explorations and interactions with the surroundings and the given environment.

We repeatedly came across three concepts within awareness that could be applicable to our analysis of consumer awareness, with regard of mobile phone consumption. The three concepts being situation, self- and consumer awareness. Thus, we find it beneficial to present a summarizing review of the three concepts. We aim to provide a broader description of the concepts, and how they apply to our research.

5.2 Situation Awareness

The “*elements*” of situation awareness (SA) vary widely between domains. In fact, Pew and Mavor (1998, p. 173) alone presents a total of seven varying definitions, but remains focused on one. This definition is described as “*the perception of the elements in the environments within a volume of time and space, the comprehension of their meaning and the projection of their status in the near future*” (Endsley & Garland, 2000, p. 3). This is also the working definition in other literature. In an attempt to clarify and gain a better understanding Pew and Mavor (1998, p. 173), talks about how the primary components of SA can be made more specific:

- **Level 1 - Perception of the elements in the environment**

In combination, the identification of the key elements or “events” serves to define a situation.

- **Level 2 - Comprehension of the current situation**

When the key elements are defined, level two of SA seeks to combine these elements into a comprehensive overall pattern, with the aim of supporting decision making and actions.

- **Level 3 - Projection of future status**

The current situation is then projected into the future, in an attempt to predict the evolution of the situation. This level supports short-term planning and option evaluation.

Simply put, SA is knowing what is going on around you (Endsley & Garland, 2000, p. 2).

5.3 Self-Awareness

Self Awareness is having a clear perception of your personality, including strengths, weaknesses, thoughts, beliefs, motivation, and emotions. Self Awareness allows you to understand other people, how they perceive you, your attitude and your responses to them in the moment. (van Warmerdam, 2018)

At the age of two, an individual’s self-awareness is developed and he/she will be able to influence personal interpretations and thoughts,

allowing a change in emotions. Alongside the development of self-awareness we also gain new knowledge about what Rochat (2003, p. 718) calls secondary emotions. As individuals discover that they are being perceived by others one might experience emotions such as pride or embarrassment, in different types of situations.

A french poet with the name Arthur Rimbaud said "*I is someone Else*" (sic), in french, "*Je est quelqu'un d'autre*", suggesting that individuals perceive themselves through the eyes of others (Rochat, 2003, p. 718).

Later in our thesis we will both have to approach these secondary emotions, as we see these as being an important part of behavioral change, creating the opportunity to make changes in individual behavior and beliefs.

5.4 Consumer Awareness

Important in the process of creating consumer awareness is the consumer's knowledge and understanding of how products are made, the safety of production, the consumers feedback etc., are important in the process of consumer awareness. However, as we discussed in chapter ??, Consumers tend to distance themselves from their device, only interacting with the finished product. Understanding that product attributes such as colors, materials etc., evolves through experience, is an important factor as this knowledge contributes to a state of (raised) consumer awareness (Briz & Ward, 2009, p. 295). Such experience can for example be searching for information before buying. A research conducted by Bailey (2005), addresses this experience and the results show that use of product review websites was one of the primary sources of creating awareness among potential consumers.

To acquire the needed, and correct, knowledge, consumers first have to acquire information before processing and interpreting it. This will eventually raise their awareness. Related to raised awareness, it is interesting to consider how the human mind deals with cognitive processes when it is exposed to new data we must interpret, analyze and potentially use. The characteristics of these processes is that they are done effortlessly. Also, they typically occur outside of awareness, either because the individual does not know when they are "using the process", or because they have been doing it for so long and it does not require any attention to the task.

In relation to consumption of mobile phones, pre-conscious automatic-

ity is what happens in a consumer mind prior to awareness and is thus associated with not being aware. The stimulus of a person, object or action is affecting consumers' behaviour without their knowledge. This is closely related to the unconscious influence of contextual forces, or merely the perception of physical behaviour of peers.

The second process, post-conscious automaticity, is dependent on prior or recent conscious thoughts and/or experience. Individuals are not in control of what will be their perceived experiences. By engaging consciously in their changing environment individuals will, depending on their experience, unconsciously think or behave in a certain way. This behavior or thought might influence a conscious or unconscious consequence.

Consumers, or more generally humans, will, over time become aware through interactions with their given environment. However, even when aware, the consumers perception, in addition to factors such as, misinterpretation, misinformation, misunderstanding of the conscious thought or experience, or the given environment, might lead them to become incorrectly aware.

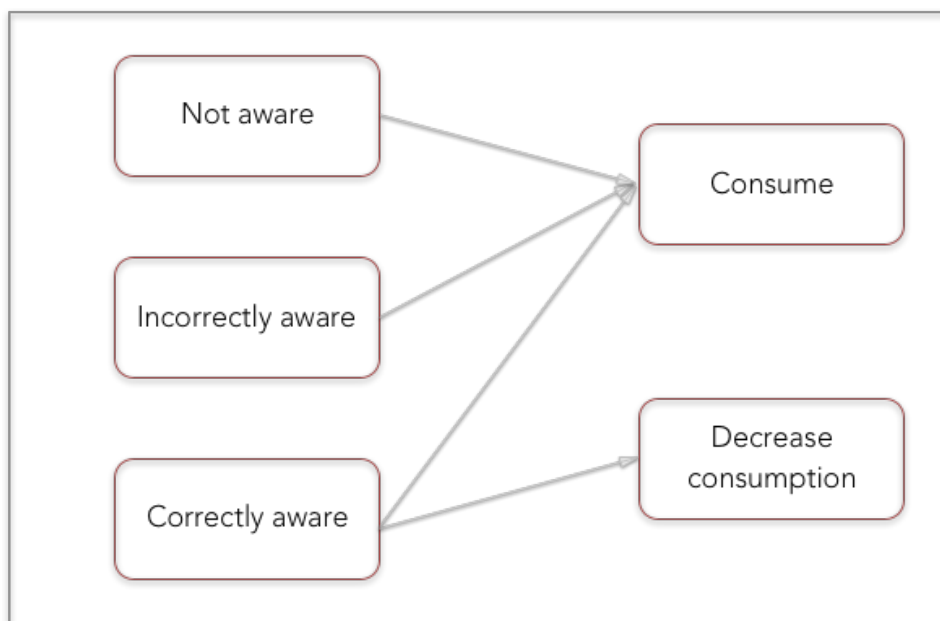


Figure 5.1: Three levels of consumer awareness, inspired by Briz and Ward (2009)

5.5 Our Definition of Awareness

Figure 5.1 is inspired by Briz and Ward (2009), and their figure showing what type of awareness is needed and how it thus can result in behavioral

change. 5.2 illustrates our perception of which concepts are important to address, and suitable for our thesis'. As discussed, potential consumers can become incorrectly aware of particular issues surrounding specific products. Hence, the opposite of being what Briz and Ward (2009), called *correctly aware* should be in focus. We find the concept of being correctly aware equally important to consider in the three concepts (of awareness) discussed. With this complete and correct knowledge the probability of behavioural change is assumed higher, but never guaranteed.

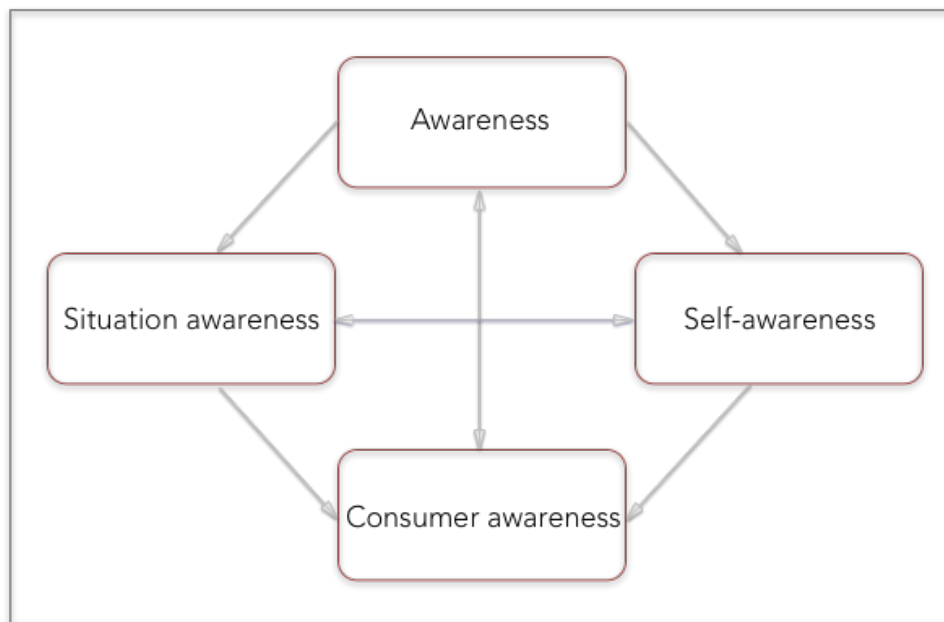


Figure 5.2: The interdependence of awareness, inspired by Briz and Ward (2009)

In summary we have found self-, consumer- and situation awareness to be relatively interdependent. Additionally, as a consumer inevitably has a “self”, as well as an individual consciously or unconsciously interacting with his/her environment, we recognize consumer awareness as involving both self- and situation awareness. Hence, in the coming sections we argue for the interconnectedness of consumer awareness in relation to self- and situation awareness.

5.5.1 Situation Awareness

Considering that a consumer who has an understanding of his/her environment, has acquired situation awareness, there is no doubt that the given environment in which a consumer exists has a significant role in creating, and affecting the consumers’ awareness. As an example, we would like to address a smaller, passive observation related to the use of

technology in everyday life. It was conducted in relation to the course INF5220, Qualitative research methods, at the University of Oslo. The observation took place at a central café, a typical place for interactions with others. In this environment, to our surprise, technologies of different sort were a prominent key element. The majority of visitors had their mobile phones within reach, while others were working on their laptops. In fact, more people were interacting with their device of choice, than with other people. In regards to the observation and display of various technology, an observer might recognize different models, brands or the number of devices others have. Especially in the changing world of technology it can be noticeable when consumers do-not own the newest device. This might lead to a fear of signaling that one is in an inferior economic position, unfashionable etc. Vice versa, if people show off their older devices aiming at life-span optimization a consumer who acquires a new device prior to end-of-life might be labelled as consuming conspicuously. The factors discussed above contribute to creating awareness surrounding the situation, e.g. creating the situation awareness of the consumer.

5.5.2 Self-Awareness

At the same time as situation awareness occurs (unconsciously) in a given environment, for example the one mentioned above, one also becomes aware of the self. Self awareness is much about knowing who you are, while increasing your understanding of others and how they perceive you. A trait of humans is our ego, which typically makes us think of ourselves as better; better than what we actually might be, and better than how others perceive us.

Our behaviour as consumers and our consumption choices are a significant part of the individual's attempt to find meaning, status and identity. In the search of self-awareness it is important that we learn to accept others' perception of ourselves and shape that perception by changing our actions.

Typically, an individual wants to be perceived as the best version of themselves, in line with their personal standards. Additionally, one wants to be perceived as in line with social norms and others. In the search of self-awareness it is important that we learn to accept others' perception of ourselves and shape that perception by changing our actions.

An individual's thoughts, values, moral or simple, behaviour, will be affected by the beliefs of others, and maybe to a greater extent, by what the respective individual wants others to believe about themselves. As a

result, if the café visitors were your peers, someone you looked up to, and someone who always had the newest technological devices, the chances are you would do the same.

5.5.3 Consumer Awareness

“By creating more awareness in one’s inner world, people would become aware of a larger range of options in how to respond to situations and make decisions. By creating more awareness to the outer world, people would gain a more thorough understanding of the impacts of their choices and behaviors on themselves and the world at large. These feedback loops will, in time, encourage more creative and empowered behavior.” (Miemis, 2012)

We believe that raised consumer awareness of the consumption of mobile phones, both on an individual and more general level, would be the first step in developing more sustainable and less obsolete behavioural patterns. However, raised awareness in itself might not be enough. Consumers might have broad knowledge about a critical issue, which bring about correct awareness, but conscience to react accordingly might still not be achieved.

Our analysis has led us to conclude that we need to focus on how to achieve correct awareness and what is required to guide the transition. In our consumer society, choices made without sufficient awareness, critical long-term thinking and wisdom may lead to unfortunate results.

Chapter 6

Theory as a Shaping Tool

Theory provides a means to structure knowledge, to evaluate and assess it, construct it, and to share it. However, little is known about how researchers put theories to work in their written texts (Beck & Stolterman, 2016). The use of theory is multifaceted and complex which enables researchers to use it as a tool in various ways. The theory used in my study share characteristics with the model of "theory as a shaping tool" presented by Beck and Stolterman (2016) and represented by Figure 6.1. The basic idea of this model is that throughout the study, theory continues to reshape the research question. In this way, theory is an internal component of the study, meaning that new theory cannot be either removed or added 'ad hoc' without inflicting modifications or consequences for other key elements.



Figure 6.1: The "Theory as a shaping tool" model, as presented by Beck and Stolterman (2016)

While this was not necessarily my desired use of theory, this process has been about keeping an open mind and embracing the theory and information needed to build a solid foundation prior to conducting research and later, proposing a design. From the beginning, my research question has been under development, or *posed and put into a dialogue with existing theory* (Beck & Stolterman, 2016).

The outcome of this dialogue is a new question or set of questions,

which we call question prime. Once these new questions emerge, the researchers proceed to the examination stage and, ultimately, to findings. Findings are then put into dialogue with question prime and (potentially) with the shaping theory. [These findings] primarily result in (1) answers to the revised question or (2) descriptions of possible directions for future inquiry. (Beck & Stolterman, 2016, p. 132)

6.1 Shaping a Research Question

The theory gathering process has increased my understanding of the initial problem domain regarding the unsustainability of the premature obsolescence of digital consumer technology. My research question within the problem domain has changed as new theory was introduced, taking into consideration. From theory, I was able to refine my question in a way so that what I will focus on and try to answer is more clear-cut and specific. Thus, my research question is, in relation to premature mobile phone obsolescence, formulated as follows:

Can Design for Awareness engage young adults to more consciously consume mobile phones?

—

Part II

Methodology and Methods

Chapter 7

Design, Consumption and Consumer Behaviour

Designers are in a position to reduce use impacts by purposefully shaping behaviour towards more sustainable practices (Lilley, 2009). However, the approaches for doing so are usually centered on smaller short-term changes in current behaviour, rather than long-term futures. There is a need for a design that concentrates on *understanding* peoples everyday consumption patterns, as well as the *influences* on consumer behaviour. By integrating a behavioural perspective, using the knowledge we have, or can obtain, on consumers actions and habits, can provide guidance and an overview of how behavioural intervention strategies, can bring forth motivation among young adult consumers to engage in more conscious consumption (Selvefors, Pedersen, & Rahe, 2011).

By understanding consumer behaviour, wasteful routines and behaviours can be discouraged in specific situations and turned into long-term behaviours through the adoption of new habits.

7.1 Design for Sustainable Consumption Behaviour

Design for Sustainable Consumption Behaviour (DSCB), is *"a combination of User Centered Design (UCD) methodology, studies of user consumption behaviour and categorized behavioural intervention strategies"* (Selvefors et al., 2011).

The approach has been defined to *"facilitate and systematize the usage of behavioural interventions strategies"* (such as Design for Sustainable Behaviour (DfSB) (Lilley, 2009; Bhamra, Lilley, & Tang, 2011), or Design with Intent (DwI) (Lockton, 2017), in order to enable product developers to focus more specifically on reducing consumption during the use phase.

Providing guidance and an overview of available intervention strategies is discussed as essential for achieving a deeper understanding of user's everyday consumption patterns as well as behaviour. Furthermore, knowledge of how user actions and habits can be used in combination with behavioural intervention strategies should be considered. This knowledge can be acquired by analyzing which, external or internal, factors that develop and maintain user habits within specific consumption situations.

Resulting in designer knowledge on how to effectively influence, guide and improve user behaviour, DSCB has the potential to discourage wasteful routines and turn them into long-term behaviours by motivating the adoption of new habits.

7.1.1 Behavioural Intervention Strategies

Generally, the industry's knowledge of behavioural aspects and different strategies for influencing behaviour are limited (Selvfors et al., 2011). This, despite the various literature highlighting how it is possible to effectively improve sustainable human behaviour by analyzing which factors that develop and maintain specific consumer habits and then guide the consumer actions towards more sustainable habits. Among this describing literature we find studies by Lilley (2009), Lockton (2017), Bhamra et al. (2011), Thaler and Sunstein (2008) and Stefansdotter, Steen-Knudsen, Flack, and Hansen (2016), among others. The strategies can be used to create and guide user motivation in different ways and thus influence to a change in behaviour. The mentioned literature have investigated and tested the potential and effectiveness of the respective intervention strategies, and while it will differ from product, to product they will be dependent on the acceptable intrusiveness of the strategy on the user's behaviour.

7.1.2 The DSCB Narration

To attain a deep understanding of what develops and maintains consumer behaviour, the entire chain of events within the consumption phases, should be considered. Referred to as the "*Cycle of consumption*," it illustrates a general chain of needs and events during a typical consumption situation. Initially, a need arises which drives the user to acquire the resource in question. The resource is then utilized until used up or until the need has ceased. When the user once again experiences a new need the chain of events is repeated.

7.1.3 Deciding on the Approach

In a majority of the literature I have read for this research, I have encountered commentaries about the need to educate consumers, providing them with information, about their consumption practices and behavioural patterns so that they can make informed choices (Valant, 2016). As briefly mentioned in chapter 1, acquiring knowledge about our patterns of behaviour in relation to consumption of mobile phones, was, in fact, what triggered my curiosity on the subject and lead me to conduct this research. I realized that the majority of people I talked to were also unaware of the situation and obsolescence phenomenon. Thus, I quickly decided I wanted to influence, this surprisingly common, consumer state of mind.

Reading up on appropriate design approaches that could be influential on consumers behaviour I came across the design approach, Design for X, where X is a variable which can have one of many possible values. Within this approach I looked further into Design for Sustainable Behaviour (Lilley, 2009) and Design for Intent (Lockton, 2017). Within this literature I found the examples portraying both these approaches to be excessively coercive, hindering and limiting consumers affordance. The article on Design for sustainability exemplified a *'Prolonged Conversation' protocol* among its strategies to sustainable behaviour. In this example, the mobile phone became "bored" if its owner made prolonged conversation in "inappropriate" environments. Conveying this "boredom" by *"slowing down the conversation by a slurring of speed", "draining the battery" and "encourage the 'called' to hang up"*. While I have not tested these types of influences on consumers myself, I can only base my thoughts on subjectivity. Nevertheless, I have little doubt about the fact that I would quickly run out of patience with such influences.

This is an excellent example of the importance of acknowledging the different views on what an acceptable level of intervention is, and the essential success factor of knowing what types of intervention is deemed as too intrusive by individual consumers (Lilley, 2009, p. 717). Though there is no doubt that the sustainability approach influences consumers behaviour, the initial informative intervention from the mobile phone regarding the user about their "inappropriate use," quickly develops into persuasive and even aggressive commands. As I did not feel a strong connection to either of these approaches, I decided to aim for a more informative approach.

7.2 Design for Awareness

Awareness, for me, has been ambiguous and challenging to define for a long time. Thus, I was initially cautious about letting it define my approach. However, it kept reappearing when I talked to others about the subject. Awareness was the most suitable word whether I was describing the realizations I experienced during, and after, taking the courses, INF5011 - *Technology Society Ethics* and SUM4019 - *Consumption, Sustainability and Social Change*, or discussing with fellow students what I thought would influence others to make a change in their behaviour. Along with statements in literature regarding raised consumer awareness as crucial (Valant, 2016), and theory gathering, I decided to look more closely into awareness and the Design for Awareness approach considering the seeming relevance for my case of mobile phones and mobile phone consumption, as well as for my desire to apply an informative approach.

As has been established through theory in chapter 5, awareness is closely related to human consciousness. Awareness is fundamental to the understanding of both their outer environment, in which they are situated, as well as their inner 'self'. Initiating an iterative process of feedback between people's outer environment and inner self, the understanding evolves into knowledge and comprehension on the connection between individual behaviour and the impact at the world at large.

When designing for awareness, the designer address people's consciousness. The overarching goal is, as presented, to establish knowledge by intervening in people's behaviour. Furthermore, there is an expectation that the knowledge will be a sufficient motivation to influence and guide people's behaviour towards a pre-determined purpose.

It is beneficial for the designer to focus intervention(s) within specific situations where people are more susceptible. Hence, to effectively systematize the use of the behavioural intervention strategy that is Design for Awareness, designers themselves must acquire knowledge on people's behaviour by analyzing which factors develop and maintain behaviour in specific situations (Selvfors et al., 2011). Having identified these factors the designer can start too contemplate how and where to more effectively intervene.

In my case of mobile phones and related consumption I will, though interaction with consumers, identify and analyze the factors that develop and maintain their behaviour throughout the three phases of consumption which are acquisition, use and disposal. Applying then the Design

for Awareness approach within the "critical situations" the goal is for consumers to comprehend the connection between individual behaviour and how their choices and actions within the consumption phases affects rate at which a device is rendered obsolete. Furthermore, the desired outcome is for their raised awareness to motivate them to engage in more conscious consumption.

Chapter 8

Research Approach

The purpose of this research is to acquire a greater understanding of consumers' behaviour and awareness in relation to mobile phone consumption among young adults. A particular research interest was to look, in-depth at consumers' actual behaviour, using participants reflections to interpret and explain the underlying reasons for their unconscious consumption. The goal of this study is to provide consumers' with knowledge on their unconscious behaviour related to the premature obsolescence of mobile phones. Additionally, I wanted to explore how design could contribute to raised awareness among young adult consumers regarding their current consumption patterns. In closing, I hope that the research will provide alternative intervention strategies on how to further raise consumers' awareness and motivate them to engage in conscious consumption of mobile phones.

Applying well-established qualitative methods as the approach to research, I was enabled to study and understand the modern social phenomena of unconscious consumption of mobile phones (Myers, 2018).

8.1 Underlying Research Paradigm

Every researcher have their own view of what constitutes truth and knowledge, and how these can be obtained. The approach taken to constitute 'valid' research will thus, be dependent on the eyes of the researcher. Due to the interconnectedness of methodologies and methods, a researcher's assumptions will influence his/her role, the different strategies of inquiry, how the research is conducted and inherently the outcome of a study. Thus, continuous engagement and awareness of the research's consequential nature should be required of the researcher

him/herself.

8.1.1 Critical Interpretive

While there is disagreement as to whether the research paradigms are mutually exclusive or not (Myers, 2018), Orlikowski and Baroudi (1991, p. 7) encourages a *"greater awareness and understanding of the diversity of assumptions that underlie various types of social research"*. My current position is that my research has elements of both the interpretive and critical traditions, and does not fit exclusively within one of these two categories. Thus, the underlying assumptions of this thesis is constructed from an application of a *critical-interpretive* paradigm as an encouragement to greater awareness and understanding.

"Interpretive studies assume that people create and associate their own subjective and intersubjective meanings in social life as they interact with the world around them" (Orlikowski & Baroudi, 1991, p. 5). Accessing the interpretations of member of a social group, the interpretive researcher attempt to understand a modern social phenomena within its real-life context. Through accessing the meanings people (participants of the study) assign to them researcher can explain why people act the way they do (Orlikowski & Baroudi, 1991). Interpretive methods of research is useful in my case of the mobile phone and mobile phone consumption as it aims at producing an understanding of the context in which the case unfolds, as well as of the processes where the case influences and is influenced by context (Myers, 2018).

A general and widespread understanding of the real-life phenomena was essential to allow a deeper insight into the social life of consumers and the meaning they apply to it. However, *"the interpretive perspective does not examine the conditions, often external, which give rise to certain meanings and experiences"* (Orlikowski & Baroudi, 1991, p. 18). As participants of a study might not be able to perceive their shaping and constraining (external) circumstances, I found the need for a more critical approach. Being more flexible and independent in its pursuit of reality, the critical paradigm was be a supplemental approach to allow for a deeper understanding of why people do as they do.

The research conducted has been substantiated by the desire to critically evaluate and transform the social reality under investigation (Orlikowski & Baroudi, 1991). Thus, my research is surely critical. Being a social critique the research challenges and discloses the alienating conditions of the status quo and the false beliefs that exists in society (discussed in a

later chapter), with the aim of transforming these prevailing, contradictory beliefs in order to establish change (Myers, 2018). According to Myers (2018) the critical paradigm assumes that social reality is produced, and reproduced by people, and that people can consciously act to change their circumstances. However, their ability to act to change these circumstances is heavily constrained by various forms of social, cultural and political domination (Myers, 2018). Exposing the prevailing, contradictory beliefs in society was necessary in order to effectively conduct this study.

8.2 Qualitative Research

Yin (2010) presents five features of qualitative research:

1. Studying the meaning of people's lives, under real-world conditions;
2. Representing the views and perspectives of the people in a study;
3. Covering the contextual conditions within which people live;
4. Contributing insights into existing or emerging concepts that may help to *explain* human social behaviour; and
5. Striving to use *multiple sources of evidence* rather than relying on a single source alone.

Emphasizing the natural and independent, a qualitative researcher wants to represent the unaffected views and perspectives of the participants of a study. The fields in study are often diverse and complex and so to also ensure the representation of real-world settings qualitative research strives to collect, integrate, and present data from a variety of sources (Yin, 2010).

8.3 Case Study

To further argue for deciding upon case study as my methodology of choice, the case study researcher typically "*digs into meaning, working to relate them to context and experience*" (Stake_2010). Reflecting, revising and describing the meanings of what is going on case studies, like my case of mobile phone, is much about the extension of experience with the qualitative aim of facilitating an understanding of a phenomenon.

Furthermore, an instrumental case study approach was adopted. Stake (2005) defines the scope of this interest as, "*The case is of secondary*

interest, it plays a supportive role, and it facilitates our understanding of something else." I found this definition applicable to my study. The mobile phone is my specific case, playing a supportive role in facilitating an understanding of conscious and unconscious human behaviour in regards to, the consumption of mobile phones. The reasons for research and research question was decided upon, although altered, in the early stages of my study. Furthermore, it was involved around the established theory, which made my 'starting point' relatable to that of an instrumental case study where the focus of study is typically known in advance.

Flyvbjerg (2006) presents five misunderstandings about case studies. One of these misunderstanding is that theoretical knowledge is more valuable than practical knowledge. I find this particularly interesting for my research as much of the conventional economic theories on consumption and consumer behaviour, builds upon the presumption of economic man, as discussed in the chapter on consumption (4). This approach aims to establish rigorous models, which can, in fact be expressed in quantitative terms used to analyse economic phenomena such as supply and demand. However, as broken down by Ackerman (1997), the theoretical knowledge presented in those theories does, in fact, not apply or show when practice is observed by e.g., social scientists. Continuing his criticism of the first misunderstanding, Flyvbjerg argues that, in general, predictive theories and universals cannot be found in the study of human affairs. Hence, when looking at the case of consumption practices, in-depth, practical knowledge might be more valuable as it gives a more accurate and nuanced view of reality.

Chapter 9

Methods

When considering which methods to implement in the study, one has to look at the purposes of the study and decide how to collect the sort of data that can answer that question. As each of the data collection activities produces different kind of data and each has its limitations (Yin, 2010). Once methods are decided upon, it is important to ensure justifications for your choices.

In order to understand and explain the social phenomena and my case of mobile phone consumption, I needed to gain a better understanding of people and the social and cultural context they live in (Myers, 2018). The question of how to cover these challenges are best answered through some of the more common methods for data gathering within qualitative research. The data collection of my study will be based on both primary and secondary sources. I have chosen to look into prevailing literature both as a means to inspire new topics of study, and further to get an overview of existing the field. From this followed two rounds of short structured interviews and lastly three in-depth, qualitative interviews.

9.1 Interviews

A well-known method for data collection within the qualitative research approach, interviews can bring forward the details of life researchers are unable to see for themselves. The ability to go deep is often the strongest argument in favour of interviewing. As the interviewees are often encouraged to reflect upon the topic(s) in question and provide detailed responses, the researcher is typically able to explore a wide range of concerns. A challenge with choosing interviews as a means for data gathering is that the researcher might discover inconsistencies. As

participants report on their experiences and behaviour they are telling you what they remember. Although providing useful data, what participants state and discuss might not be completely accurate and in correspondence with reality and their practices (Iachello & Hong, 2007, p. 36).

Interviews can take many forms, such as *structured*, *unstructured* or *semi-structured* (Crang & Cook, 2007, p. 60). Yin (2010) narrow it down, considering all the forms to fall into either one of two types: structured interviews or qualitative interviews. Within my study, both types are represented.

9.1.1 Identifying Potential Participants

In my case, looking at the consumption of mobile phones, I would have close to an unlimited number of potential participants as the majority of consumers today are mobile phone users. Thus, narrowing down the pool of potential participants seemed both necessary and logical. Firstly, I was interested in participants that were not difficult to get a hold of. With this I mean participants that would possibly be a part of the survey as well as later conducted interviews. Secondly, it would be beneficial to choose participants geographically close to my "workplace", which was mainly at the Department of Informatics. Additionally, I was initially curious whether young adults, like myself, consume the same way. Lastly, I wanted to explore if and whether they too are incompletely or incorrectly aware of their current behavioural pattern

Looking at attributes such as demographics, education, gender, age in combination it was decided that the desired interview participants would obtain the following characteristics:

- Students of Information Technology (IT),
- male or female, and
- 'young adults' between 20 and 30 years old.

9.1.2 The Short Structured Interviews

Some of the data gathering was done in collaboration with a fellow master student. Together we conducted short structured interviews in both Oslo, Norway and Cape Town, South Africa. The approach of our initial interviews shared multiple characteristics of a survey or questionnaire, as we had more carefully scripted interactions with the participants. This is what, Yin (2010), identifies as structured interviews. My fellow student and

I chose this type of interviews as it is an effective technique for collecting data from a larger population, as well as the fact that results in the form of numbers or prescriptive statistics from more quantitative-like methods, often helps the reader understand how prevalent or typical a finding is. Additionally, the data gathered from such interviews are, due to asking the same questions, sometimes regarded as more accurate and seen as providing information with high reliability.

Interview Structure

As we were planning the interview questions we found it necessary to not exclusively include close ended questions, although this is the typicality of structured interviews. As our aim was to have consumers identify and become aware of their behavioural pattern on their own, we decided that by also including some open ended questions we would not "take things for granted" or "put words in their mouths". Participants were still quite limited in their response possibilities, however, due to the short and precise formulation of the questions. While conducting the interviews in public, our roles as researchers became more formal with the aim of consistent behaviour during each interview.

In regard to asking questions when conducting structured interviews, one should typically ask each respective participant the same set of predefined questions in the same, predefined, order. In our interviews, however, we had some "question dependencies". The structure of the interview was made to follow and/or resemble the consumption phases of a mobile phone, with more specific references to the three categories of acquisition, use and disposal. Thus, most questions were asked in this particular order. Hence, dependent on the answer of one, more general question we would, or would not ask a follow-up question(s). By example, one question asked if the participant had ever repaired his/her mobile phone, to which the respondent says either "yes" or "no". In this case, if the participant answers no, there was no point in asking the follow-up question about if he/she repaired it herself or sent it to a repair centre. In the end, we made a collection of 13 questions of which five questions were dependent on other questions.

Implementation

Every year the Department of Informatics, at the University of Oslo (UiO), arrange a career day for their students. Encouraged to take some time of from studying in order to attend the various seminars etc, the hallways

are especially filled with students on this particular day. Thus, we decided that it would also be a good time to conduct the first of two rounds of interviews.

In November we visited fellow students conducting fieldwork in the city of Cape Town, which explains the deviating location for our second round of data gathering. Here, we were challenged in maintaining our predetermined participant characteristics. The intention was to visit a local University. However, restricted access to campus, the Christmas holidays and unexpected closing of schools forced us to think of alternatives. The next best solution was to conduct the interviews at a busy local shopping centre, approaching people who appeared to fit the wanted characteristics. Luckily, a good judge of character, ensured that the majority of our participants at least placed within our chosen characteristics of 'young adults'. Participants were recruited the interviews, on site, participating on a voluntary basis. Prior to asking questions participants were orally informed about the study, its purpose and the intended use. Confidentiality was ensured in regards to the particular information participants shared.

In total we have conducted 69 interviews, whereas 33 interviews were done at the Department of Informatics, and the remaining 36 were conducted in Cape Town. In both cases the questions, result and data gathered was plotted into a Google forms document in order to read and analyse the findings more easily.

9.1.3 The Qualitative Interviews

As informed by Myers, there is room to include a researcher's own impression and reactions within qualitative research. As the short structured interviews did not leave much room for in-depth discussion, which nevertheless was not the intended purpose, I saw the advantages of conducting more focused qualitative interviews to ensure versatility. Adopting a critical interview approach fosters conversation and reflection, and provides a more critical understanding of both consumers and the phenomena of mobile phone consumption. This method is thus, particularly useful in studying why people do as they do and looking into how they, themselves, experience the phenomena. This, almost anthropological approach, also serve a type of empirical validation as I do not take people out of the problem situation, but rather sit down with them and try to understand and intervene in their consumption patterns.

Interview Composition

How consumers reason when making decision and what influence product life-spans, are not well researched. Thus, the qualitative interviews were based on a set of open ended questions, where participants words and ideas were of main interest. The structure of the interviews replicated the sequence used in the short structured interviews. Leading the participant through all respective phases of consumption I wanted to attain a deeper understanding of the factors, which develop and maintain consumers behaviour in a specific consumption situations (Selvefors et al., 2011). Including the entire chain of events should thus be considered. Looking at the definition of consumption from chapter 4, the phases are; selection, purchase, use, maintenance, repair and disposal.

Participants of the qualitative interviews were encouraged to tell the story of how they moved from their first to their current phone, explaining, for example, how long they used the respective phones and why they replaced it. As recognized by, Selvefors et al. (2011), "a narrative process will provide a good overview of where to go in-depth further on in the analysis." Various probing questions were added throughout the interviews. The qualitative interview did also entailed question dependencies, but not to the same degree as the short structured interviews.

Implementation

I enlisted three volunteers for my qualitative interviews, coincidentally all were women. They were interviewed individually as I wanted to avoid any potential group biases that might occur in a focus group. As mentioned in Crang and Cook (2007), when gathering people who are not familiar, the individuals might *"drastically alter the type of history spoken about, [and] also how it was spoken about"*. Another consideration was that in order to have the discussion remain as neutral as possible, in the eyes of the individual participant, it would be beneficial to conduct the interviews one-on-one.

9.2 Data Gathering - the Process

My process of data gathering and following analysis has been shaping, along with theory, how I approach the steps of my research. The process is comparable to the DSCB process described in Selvefors et al. (2011), and consists of the following steps:

1. Identifying, through theory, the expected consumer behaviour actions in relation to premature obsolescence of mobile phones,
2. then the actual consumer behaviour and consumption actions are identified through short structured interviews.
3. One layer of analysis based on the identified behaviour and actions is applied, in order to provide an overview of the different aspects influencing the participants.

Based upon this summary, in order to find the "critical situation" where DfA can be introduced, step 1-3 reiterated. During the second iteration the interviews were qualitative in-depth interviews with a basis in expected user behaviour from both the short structured interviews as well as theory.

As the data gathering came to an end I had both quantitative and qualitative data findings regarding aspects influencing participants actual consumption to base my further research on. Having to decide, once more, where to efficiently introduce DfA.

Throughout the data gathering the analysis I have conducted was inspired by content analysis. Hsieh and Shannon (2005) elaborates on the 'conventional content analysis' approach, which exemplifies that *"coding categories are derived directly from the text data. With a directed approach, analysis starts with a theory or relevant research findings as guidance for initial codes"*. This applies to my working method of avoiding to use preconceived categories, but rather allowing these categories and their names, to flow from the data (Hsieh & Shannon, 2005). This was the case for both the short structured interviews as well as for the qualitative interviews.

The short structured interviews, although structured, as explained they were primarily made up of open ended questions. Post data gathering, the master student I collaborated with and I, reviewed the responses naming categories based on the commonalities within the responses (see table 10.1 and 10.2). As for the qualitative interviews, although the different consumption phases guided the interviews, the grouping of answers done in appendix C and appendix D, were solely derived from the text data that was previously gathered.

9.3 Ethical Considerations

"Norsk Senter for Forskningsdata" Norsk Senter for Forskningsdata (NSD), is a resource centre, which *"assists researchers with regard to data gathering,*

data analysis, and issues of methodology, privacy and research ethics". For this research there was limited ethical considerations to be taken as the data gathered contained neither sensitive or personal data, nor directly or indirectly identifiable data. This meant that most routines for handling data set by the NSD did not apply to my research I will present some considerations from when I conducted interviews.

9.3.1 Interviews

Throughout the research all data remained anonymous as I did not for example, ask for names, phone numbers, take pictures. Additionally I did not record the interviews as I found extensive note taking to be both efficient and sufficient. The one thing I identify in my findings is the differences between the participants from Cape Town and UiO. While the short structured interviews were conducted at two different locations, this is the only thing that separates them as they are both in abundance of young adults of both genders and within the age range.

Instead of using a consent form participants were, prior to each interview orally informed about the the purpose of the research and what the data would be used for. All participants voluntarily decided to proceed.

Part III

Research

Chapter 10

Findings

Exploring the consumption of mobile phones through the participants' perspectives enabled the assessment of the main factors that develop and maintain their consumer habits and thus influence premature product replacement. Trying to further analyse their individual, as well as more common behaviour, I looked for correlations between premature product replacement and the influences participants identified as the main reasons for rendering a product obsolete. This chapter aims to present my findings, in such a way so that it can be used to discuss and provide a reply to the study's research question of how to engage young adults in more conscious mobile phone consumption through a design for awareness approach.

As mentioned in section 9.2, a first layers of analysis was applied after conducting the short structured interviews. This analysis was carried out as a means to identify actual consumer behaviour and actions. Furthermore, the analysis influenced the next research step, guiding, for example, the formulation of questions for the qualitative interviews and helping in the grouping of redundant consumption phases as will be presented in section 10.2.1. The first layer of analysis was an essential part of presenting the interview findings, and thus it will similarly be part of this chapter.

Additionally, following the qualitative interviews, a second layer of analysis was applied. As the table presenting the qualitative interview findings is presented in this chapter, so is the applied content analysis. While the meaning of the colour coding will be presented, more extensive analysis will be conducted and discussed in chapter 11.

10.1 Short Structured Interviews

While gathering the responses for our short structured interviews, I recall the facial expressions and comments of participants as they were answering the different questions. It seemed like consumption and consumption habits were seen as a private, touchy subject, with strong emotions, assumptions, and opinions associated with it. Becoming, as was intended, increasingly more aware of personal mobile phone consumption, some participants were laughing, in surprise, of their answers already after our initial questions, while others seemed to experience a feeling of embarrassment.

Table 10.1, represents the participant answers from the short structured interviews conducted at both University of Oslo (UiO) and in Cape Town. The table is not entirely representative of the questions we asked but is made up of the responses that were more frequently provided within the interview questions, and the answers most relevant to my research.

10.1.1 Similarities and Differences Within Consumption Phases

On average, the number of acquired mobile phones within the past five years was three. Reported from 1/11 of participants at UiO, and 11/36 of participants in Cape Town. Conspicuously no participants stated that they had had only one mobile phone. The most noticeable difference between the two locations was that, in Cape Town, many participants were provided with a new mobile phone from their chosen mobile phone provider. This was, in fact, one of the main reasons that rendered their mobile phone obsolete and thus replacing their current mobile phone. In contrast, at UiO, where the opportunity of being provided with a new mobile phone not was mentioned as an alternative by any participants. This arrangement with a service provider, although somewhat dependent on the participants' subscription, this enables consumers to continue their excessive consumption.

Related to Selection and Purchase

It became evident that replacing mobile phones frequently is not necessarily dependent on having a mobile phone provider and subscription which 'semi-automatically' provides you with a new one. For example, 2/9 participants from Cape Town reported having 5 or more mobile phones within the last five years. However, only one participant stated it was due to being provided with a new through subscription. The findings from UiO show

Selection	Purchase	Use	Maintenance and repair	Disposal
Used phones Half of those who had not previously purchased a used mobile phone did not know why they did not. 1/3 of those who had not previously purchased a used mobile phone said they wanted a brand new phone instead. 1/4 of those who had not previously purchased a used mobile phone said they wanted a brand new phone instead. 3/6 of those who had previously purchased a used mobile phone did so because it was a cheaper alternative. 8/9 of those who had previously purchased a used mobile phone did so because it was a cheaper alternative. 11/26 of those who had never purchased a used mobile phone said it was because their contract provided them with a new one. 4/13 of those who had never purchased a used mobile phone said it was because they were sceptical about previous use. 2/13 of those who had never purchased a used mobile phone said it was because they wanted a brand new phone.	Number of phones 13/33 have had three mobile phones within the last five years. 6/33 have had five or more mobile phones. 11/36 have had three mobile phones within the last five years. 2/9 have had five or more mobile phones within the last five years. No one has had only one mobile phone within the last five years. Purchase used mobile phone 6/33 said they have purchased a used mobile phone. 24/33 said they have never purchased a used mobile phone. 9/36 said they have purchased a used mobile phone. 13/18 said they have never purchased a used mobile phone.	Reason for replacing 13/33 did not know specifically what was wrong with their mobile phone when they replaced it. 16/33 said they replaced their mobile phones because of broken hardware/exterior 8/33 said they replaced their mobile phones because of slow software. 7/33 said they replaced their mobile phones because they wanted a new one. 2/9 did not know specifically what was wrong with their mobile phone when they replaced it. 1/12 said they replaced their mobile phones because of broken hardware/exterior 13/36 said they replaced their mobile phones because they wanted a new one. 1/3 said they replaced their mobile phones because of slow software 1/6 replaced their mobile phones because their contract provided them with a new one.	Repair 20/33 have had their mobile phones repaired. 13/33 have not had their mobile phones repaired. 7/9 have had their mobile phones repaired. 2/9 have not had their mobile phones repaired. Repair centre 19/20 of those who had their mobile phones repaired sent it to a repair centre. 40% of those who had their mobile phones repaired at a repair centre said it was because they do not have the knowledge to do it themselves. 4/5 of those who had their mobile phones repaired at a repair centre said it was because of warranties. All of those who had their mobile phones repaired said that they repaired it themselves and did so because they like to fix things. 13/14 of those who had their mobile phones repaired sent it to a repair centre. 21/26 of those who had their mobile phones repaired at a repair centre said it was because they do not have the knowledge to do it themselves. 5/26 of those who had their mobile phones repaired at a repair centre said it was because of warranties. All repaired their mobile phones themselves because they like to fix things.	Usability when disposed 29/33 said their mobile phones were still usable. 3/33 said their mobile phones were usable, but not up to their standard. 13/33 said their mobile phones were not usable. 25/33 said their mobile phones were still usable when they were disposed. 2/33 said their mobile phones were not up to their standard when they were disposed. 4/33 said their mobile phones were not usable when disposed. After disposal 25/32 kept old mobile phones in a drawer. 1/4 sold or gave away their mobile phone. 7/32 recycled the mobile phone as electronic waste. 2/32 threw the mobile phone in unspecified garbage. 19/32 sold or gave away their mobile phones. Half kept old mobile phones in a drawer. 1/16 recycled the mobile phones as electronic waste. One threw the mobile phone in unspecified garbage.

Table 10.1: Responses from short structured interviews conducted at UiO (blue) and in Cape Town (green).

that 6/33 participants still had acquired a new mobile phone every year, for the past five years.

The vast majority of participants had never purchased a used mobile phone. The reasons for this differed. For 11/26 in Cape Town, it was provider-dependent, while the two other top reasons were skepticism

concerning previous use (4/14) and an honest "I don't know" (3/13). The latter two answer was a commonly stated reason at both locations. Not knowing why was representative for half of UiO participants, while 1/4 were also skeptical about previous use. Lastly, 1/3 of UiO participants stated that they did not buy a used mobile phone as they wanted a new one.

On the other hand, while only 5/23 of all participants had ever bought a used mobile phone, their reason for doing so was almost exclusively price-related.

Related to Maintenance and Repair

The vast majority of both participants from UiO and Cape Town who had their mobile phones repaired chose to send their devices to a repair center (authorized or third parties) instead of conducting self-repair. Participants were generally of the opinion that they do not have the required knowledge to accomplish self-repair on their mobile devices. Neither did they have the confidence. Some participants laughed at the thought, whereas others seemed rather intimidated, convinced that they would conduct the opposite of repair if they ever dared to try: *"I have no belief in myself that I would be able to do it"*, *"I don't even know how you get 'into' an iPhone"*. Hence it became redundantly obvious that many of the challenges and problems experienced by consumers were caused by their lack of knowledge.

In the user manual of Apple's iPhone, it is made clear that self-repair is not desired or lucrative for the consumer to perform (Inc., 2017). Warranties, and the expiration of these were the second most common concern and a central influence among participants in both locations who chose an authorized repair service provider and thus abstained from self-repair.

Only 13 out of 33 participants (UiO) and 8 out of 36 participants (Cape Town) had never had their mobile phones repaired at all. What was interesting to see from the findings from Cape Town, however, was why participants had not chosen repair. In this case, the findings show that the majority of participants were experiencing slow software and seemed to favour replacement over repair as malfunctioning software is more a more complicated problem than a broken screen, and typically not an easy fix.

Related to Disposal

Participants from UiO stated the top three reasons for replacing mobile phones was, broken (unspecified), broken hardware or slow software.

Device malfunctioning of different causes was not as typical in Cape Town. Here, the top three causes were more widespread including: "I wanted a new one," slow software and stolen/lost.

At UiO, the "broken (unspecified)" response is interesting as it meant that participants were not able to specify what was 'wrong' with their devices. Rather the 13 out of 33 participants stated that their mobile phone was malfunctioning which caused, for example, "frustration during use" and thus, replacement or disposal of the device.

Also, what was interesting as we got to the questions regarding repair was that 25/33 of participants at UiO admitted their mobile phones were still usable when they were replaced. The results from these same questions, asked in Cape Town, show quite similar results, where 29/33 of participants seem to replace usable mobile phones. Some of these participants (1/11 at UiO and 2/33 in Cape Town) casually provided additional responses, saying that although usable, it was replaced or disposed as it was no longer up to their user standard.

In a related question, concerned with what was done with the devices after the acquisition of a new one, 25/32 UiO participants and half of the participants from Cape Town replied that they kept their mobile phones in what was often referred to as the "electronics drawer." The commonly given reasons of why were *"I don't know why,"* or *"I have the space"*. As we remember that in both locations, a high number of devices were rendered usable at the time of disposal and replacement, it was surprising to see that only 8/25 at UiO chose to give away or sell their still functioning mobile phones. This number differs widely from the 19/29 participants in Cape Town who reportedly did the same.

A minority of participants reportedly kept their old mobile phones for backup, storage, or if their current phone needs repair. Other participants were apologetic *"I was supposed to [pawn it but did not get the wanted amount of money back], [recycle it but never got there], or [but I don't have the information or knowledge about what to do or where to recycle]"*.

Summary of Short Interview Findings

Table 10.2, is representative of the most relevant responses and extracted data from the short structured interviews conducted at UiO and in Cape Town. This summary is also part of what my empirical analysis bases itself on. In this table, the six previously defined phases of consumption have been combined due to redundancy. The new grouping follows the prerequisites presented in the upcoming section 10.2.1, called "Phases of

consumption".

Acquisition	Use	Disposal
Number of mobile phones 14/69 have had five or more mobile phones within the last five years. 27/69 have had three mobile phones within the last five years. Purchasing used mobile phones 11/14 purchased used mobile phones because they are a cheaper alternative . 50/69 have never bought a used mobile phone. 14/50 were sceptical of the earlier use of used mobile phones. 1/25 were concerned about warranties . 18/50 did not know why they did not purchase a used mobile phone. 1/50 did not know where to purchase a used mobile phone. 11/50 got a new mobile phone from their contractor . 12/50 wanted a brand new mobile phone	Replacement of mobile phones 14/69 replaced their mobile phone because of broken hardware . 13/69 replaced their phone because their mobile phones were misplaced or stolen . 20/69 replaced their mobile phones because of slow software . 7/69 replaced their mobile phones because of battery malfunction . 5/69 replaced their mobile phones because they thought it was too old . 15/69 replaced their mobile phones because they wanted a new one . 6/69 replaced their mobile phones because their contractor gave them a new one . 21/69 replaced their mobile phones without really knowing what was wrong with it . Reasons for repair 48/69 has repaired their mobile phones and the vast majority chose to repair at a repair centre . 29/36 repaired their mobile phone at a repair centre because they do not have the knowledge to do it themselves . 2/9 repaired their mobile phone at a repair centre because of warranties . 1/16 repaired their phone at a repair centre because it meant less time investment on their part. All who repaired their own mobile said it was because it seemed like an easy thing to fix .	Usability at disposal 54/69 said their mobile phones were still usable when they replaced it. 5/54 added that their mobile phone was not up to their standards when replacing it. After disposal 41/64 kept old mobile phones in a drawer . 27/64 gave away or sold their mobile phones. 9/64 recycled their old mobile phones as electronic waste . 3/64 threw their mobile phones in unspecified garbage .

Table 10.2: Summary of responses from short structured interviews conducted at UiO and in Cape Town.

Additionally, the findings enabled me to get insight into the reasons why consumers typically come to see their mobile phone(s) as obsolete. Figure 10.1 and 10.2 presents responses to the question of what was the reasons for rendering a mobile phone obsolete. As we can see there are many factors making consumers discard or replace their mobile phones

prematurely, but some categories are more prominent.

33 svar

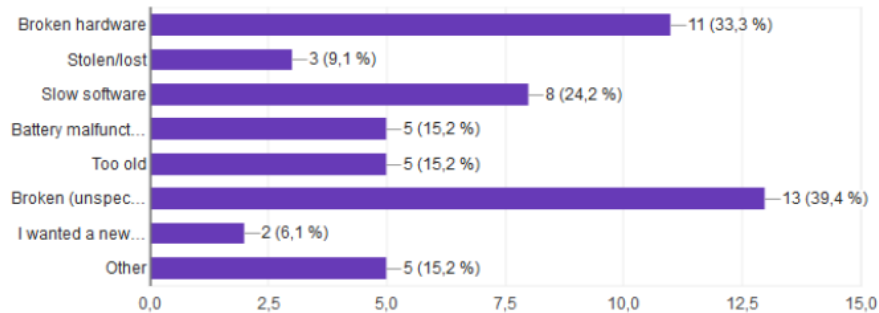


Figure 10.1: Reasons for rendering a mobile phone obsolete. Summary of short structured interviews conducted at UiO.

36 svar

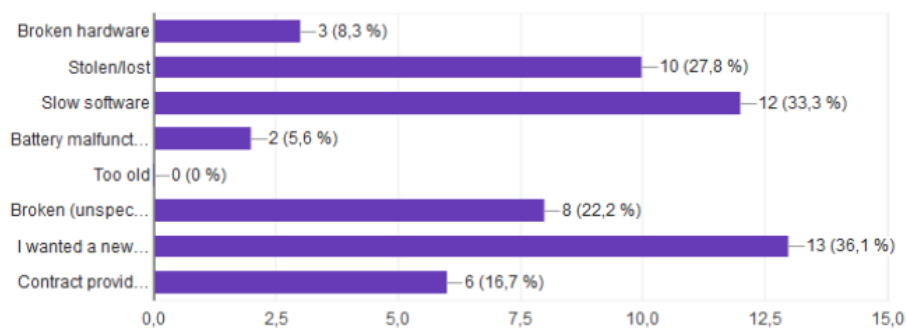


Figure 10.2: Reasons for rendering a mobile phone obsolete. Summary of short structured interviews conducted in Cape Town.

Among the top four, most common reasons for rendering a product obsolete across the two locations were;

- Broken hardware, as in, e.g., wear and tear or fully broken.
- Slow software, as in, e.g., operating system.
- Broken (unspecified), includes both soft- and hardware when the consumer is not sure.
- "I wanted a new one," as in the availability of new alternatives that perform better, are cheaper or both. Alternatively because of the consumer's personal preferences, functional requirements, or style.

Having identified the most common reasons among participants for replacing and disposing their mobile phones I wanted to see them in relation to the all-embracing categories of obsolescence I decided to put my focus on in chapter 3, to see if these categories were also represented in practice.

- **Broken hardware**, as in, e.g., wear and tear or fully broken is much related to both planned and perceived obsolescence. Materials and design might start to look older after time, a screen might be broken and cannot be fixed either because of unobtainable parts or due to high repair costs.
- **Slow software**, as in, e.g., operating system, resembles planned obsolescence as it has to do with the limitation of functions, or incompatibility issues after successive system updates or slow system response as the devices hold more software.
- **"I wanted a new one"**, as in the availability of alternatives that perform better, are cheaper or both. Also a combination of the two subcategories of product obsolescence. As in changes in a consumer's personal preferences, like functional requirements, or style is very much related to, and very typical perceived obsolescence.
- **Broken (unspecified)**, could include both/either soft- and hardware. As the consumer states, they are not sure about the reason for their obsolete device I believe it is related to the hardware or the non-visible part of the device. Based on this, I find this particular category to relate more to the category of planned obsolescence. The reason for the categorization is that most consumers do not obtain enough knowledge about the inside of a device, e.g., because of faded repair practices.

10.2 Qualitative Interviews

Like the short structured interviews, the qualitative interviews explored consumption from the individual consumer perspective leading the participants through all respective phases of consumption. Taking all phases into consideration was an attempt to get participants to comprehend and evaluate their consumption of mobile phones as a whole and not just individual acts, such as a purchase. Additionally, the need to understand consumer behaviour beyond the phase of acquisition has been recognized as a critical

requirement in literature, such as Cooper (2016, p. 322). Achieving this understanding further agrees with the wider context of my research interest, the pursuit of more sustainable consumption of digital consumer technology.

10.2.1 Phases of Consumption

For the qualitative interviews, it proved beneficial for participants to be presented with explanations of what is included in the respective phases of consumption. These specifications, as can be viewed below, worked as a guide for the participants, helping them keep "on track" during our discussion.

The phases of consumption explained:

- Selection: When consumers carefully gather information about which mobile phone they should purchase, depending on what they find most suitable for their individual needs.
- Purchase: The actual purchase or acquisition of a mobile phone, through payment.
- Use: Using the mobile phone for an- or its intended purpose in the consumer's everyday life.
- Maintenance: The process of preserving the original condition of a mobile phone as nearly, and as long, as possible. Like providing repair if needed.
- Repair: Restoring and replacing a damaged, worn, broken, etc., mobile phone, or parts of it, to a good, usable, operating condition or state. Repair aims to exploit the remaining utility and residual value of the device before final disposal.
- Disposal: The last replacement or riddance of a mobile phone, reduces the device to "waste," This phase also includes the replacement of a mobile phone.

The discussions revealed that there are substantial relationships between certain consumption phases, making them closely interdependent.

Like the *Cycle of Consumption*, defined by, Selvefors et al. (2011), the phases of consumption I defined in the consumption chapter can be seen as a continual cycle. In the case of mobile phone consumption the disposal phase initiates a repetition of the cycle when the mobile phone is "used up"

or until the consumer need has ceased. The need typically ceases as another need arises, and thus the cycle is completed.

To avoid redundancy of findings, the concerning phases have been put in a more general grouping, presented below.

- The first grouping is between the phases concerning selection and purchase, which will be further referred to as the **acquisition phase**.

Often the two phases occur at the same time, typically at a mobile retailer. Regarding consumer influences, they might be influenced to select, and thus purchase the product which proves the interconnections/dependency.

- The second grouping is between the use, maintenance and repair phases, which will be further referred to as the **use phase**.

Maintenance and repair go well together and often represent two sides of the same situation, as repair is often a typical method for providing maintenance. Additionally, maintenance and repair is an inherent part of using a mobile phone and preserving its original condition for as long as possible.

- The third and last group will thus be made up of the **disposal phase**.

Although the disposal phase inherently includes the replacement of products, I would like to point out that data from the conducted interviews revealed that the vast majority of consumers do, in fact, not dispose their mobile phones as in reducing it to electronic waste. Only 9/64 participants stated they had done this, with either one or several of their old mobile phones. As it seems like participants have become habituated to merely their replaced devices by storing them in a drawer at home, I want to briefly emphasize “replacement” as a particularly important component of this grouping.

10.2.2 Participant Identifications

Discussing consumption more in-depth with participants enabled better insight into the influences encountered and actions carried out within the consumption phases. Based on identification and reasoning done by participants themselves, table C provides an overview of consumer actions and habits while also capturing the diversity and depth of consumer experiences.

As stated in the chapter introduction, the second layer of data was applied to this data to form a deeper understanding of the identified actions

and habits. Doing so, I hoped to get a more structured overview of how behavioural intervention strategies, such as my chosen DfA approach, could be applied in the different consumption phases. By looking more closely at the commonalities between the given responses, I aimed to gain knowledge on how to more clearly categorize the factors affecting consumer behaviour and to create a basis for useful data collection and later discussion and exploration.

10.2.3 Coding

The lists below represent the given meaning of the colour coding in table X. Coding and then grouping the answers enabled me to identify factors and influences that develop, influence and maintain participants actions and habits. This coding also structured further the influences and factors on consumer actions described and discussed by the qualitative interview participants. It was done in an attempt of identifying prominent factors affecting consumers' behaviour and actions within the consumption phases and where DfA could be effectively applied to influence participants current actions and behaviour.

Coding in acquisition phase:

- Pale blue: Related to trends (technological or more general) and whether or not to follow them.
- Pink: Reasons of why and when to purchase a new mobile phone.
- Nude: Reasons for not purchasing a used mobile phone.

Coding in use phase:

- Darker blue: Technological reasons for the replacement of mobile phones.
- Yellow: Psychological reasons for the replacement of mobile phones
- Lighter blue: A psychological perspective on the replacement of mobile phones.
- Pale green: Life-span expectancy of mobile phones in general.
- Pale purple: Life-span expectancy of mobile phones they acquire and how it relates to the use of others.

- Salmon: Expectations and durability related to mobile phones.
- Pink: Participant's propositions on what would make them more conscious about their consumption of mobile phones.
- Yellow: Valued functionality of a mobile phone.

Coding in disposal phase:

- Green: Reasons for not conducting self-repair.
- Blue: Reasons for not choosing repair.
- Pink: Usability/ state of mobile phones when disposed and replaced.
- Red: What is done to the mobile phones at disposal and replacement and why.

Chapter 11

Discussion

From the data collected and presented in table C, we see that participants have identified a variety of factors which individually and combined affect their actions and habits. Some of these factors, are distinctive within phases or individually stated by participants. Others are more common, repeated across consumption phases, as well as participants. What they have in common, is that they generally do not support the engagement of conscious consumption.

In this chapter, I will present, make sense of and use the empirical data and theory from previous chapters. What is presented in this discussion is based on participants' responses and their conception of prevailing mobile phone consumption and product use in light of their experiences. The discussion will show how and if DfA can be applied and efficiently introduced within the different consumption phases in an attempt to engage young adult consumers in more conscious consumption.

11.1 Obsolescence

11.1.1 The Categories in Practice

Looking at the coded table of factors influencing participant consumer behaviour and habits, it is noticeable how a majority of the responses fit within both categories of obsolescence defined in chapter 3; Planned and Perceived. For example, in the acquisition phase, influences such as "*having what others have*", are closely related to obsolescence. Similar examples can also be found in all phases of consumption, and they thus demonstrate the extent of how obsolescence impacts consumer thinking and behaviour, and how "appropriate involvement of the user with the product is essential" (Cooper, 2016, p. 53).

From Planned to Perceived Obsolescence

Across the consumption phases, participants' reason for replacing their mobile phone related to some form of psychological influence. Looking at the summarizing table 10.2, we see that the top three reasons for replacing a mobile phone are; *"not knowing what is wrong," "slow software,"* and *"I want a new one."* The qualitative interview summary (see table C), shows very similar answers. Participants stated for example, that mobile phones were *"not up to [participants'] standards."*

As we know from the sections on Planned and Perceived obsolescence from chapter 3, both categories are closely linked to products designed to only last a certain amount of time, allowing consumers to indulge in their wants and desires. What characterizes Perceived obsolescence is that it works purely on a psychological level, closely related to consumer emotions.

Participants' responses and the provided definitions thus show how perceived obsolescence is indeed the most persistent influence on participant actions and habits related to consumption. In one extreme case, participant A humorously told about an occurrence from when she was younger:

"I remember dipping my mobile phone in milk because I really, really wanted the newest model."

– Participant A

Through my analysis, I realized that perceived obsolescence was often initiated by planned obsolescence. Participant A, discussing the trouble she experienced with her iPhone's slowing software, stated that *"I don't want to deal with a slow phone! Then I will just buy a new one."* The slow software of participant A's iPhone is a commonly known case of planned obsolescence as *"iPhone releases often coincide with the release of a new version of iOS [...]. While Apple has always made a point of making iOS backward compatible with older iPhone models as long as possible, new operating systems tend not to run as smoothly on the aged hardware of older models"* (Richter, 2015). In fact, in late 2017, after conducting these interviews, Apple Inc made a statement, admitting to slowing down iPhone's (Kirby, 2017). For participant A, the discontent of slow software evolved into perceived obsolescence, as she had concluded that the mobile phone as *"not up to her standards."* Acknowledging during the interview that the replaced mobile phone was still usable further insinuates that she, rendered her mobile phone obsolete by perception rather than functions.

Participants B and C also mentioned slow software concerning the "*not up to my standards*" response. They experienced frustration as they were not able to effectively use their mobile phones as desired. Participant C expressed her annoyance regarding not being able to access or use the mobile phone camera "*in action*", due to both slow software, and unexpected battery malfunction.

"The problem I often have is that the iPhone's get slow and becomes non responsive. Battery life is often also poor [...]."

– Participant C

An article, by Statista.com, called "The Slow iPhone phenomenon" Richter (2015), explains how planned and perceived obsolescence can be connected. Although slow software is caused by planned obsolescence, the article highlights how Google searches for "iPhone slow" has peaked once every year since 2008, with each of those peaks occurring right after manufacturing company Apple have released a new model. The article states that the "Slow iPhone" phenomenon is merely psychological and hugely dependent on the information that a newer model is, or is about to be launched (Richter, 2015). In the case of the slow iPhone of participant A, it is plausible that the launch of the new model unconsciously manipulated her.

Planned Obsolescence

Experiencing slow software due to OS upgrades are undoubtedly important causes of planned obsolescence. When participants addressed the issue, they acknowledged that their phones were still working, but that they felt frustrated with the performance of their phones and not being able to carry out their *desired* use.

Planned obsolescence through slow software is the intentional drain of utility capacity from the mobile phone over time. In the end, the mobile phone might not be able to perform its *intended* use. Delayed software responses or moderately slower performance should also be considered as a result of intended use. Additionally, it might be caused by an excessive collection of software "greedy" applications "running in the background." Thus I found this case of planned obsolescence to be the predecessor to a case of perceived obsolescence and categorized it thereafter.

There were cases of "pure" planned obsolescence. When talking about the category of technical obsolescence (section 3.3), Cooper (2016,

p. 49) touched upon frustration among consumers caused by “*technological change when a type of product that traditionally worked for many years is now less robustly built and seen to change every year.*” Below are some typical statements from my interviews;

“I don’t think mobile phones today are very long-lasting. They get quickly worn and slow. Before, when I had my first phones, they lasted longer, but then smarphones came along.”

– Participant B

“I don’t think smartphones are very long-lasting and I do have lower expectations regarding endurance and resilience than before. I remember when I got my first ‘touch phone’, an LG. At that time, the ‘touch features’ were quite new and I remember not being satisfied with the responsiveness of these features. They were pretty bad, so when I accidentally ended up dropping it in the toilet I just went back to my old flip-phone, a Samsung.”

– Participant C

11.1.2 Obsolescence and Design for Awareness

The essence of my findings and analysis regarding obsolescence is that psychological factors are most influential to consumer behaviour and consumption actions. Participants were driven by a desire based on their perception of other consumers. Wanting what everyone else want or have is fundamentally driven by a consumer’s emotions. Thus, this is also what the design for awareness approach should be directed at.

11.2 Consumption

11.2.1 Steered by goals

Reflecting upon participants actions, and why they are such profoundly influenced by perceived obsolescence, I found that it can be closely related to a possible conflict between their individual goals as humans, and their goals as consumers (if there is a consumer goal) (Nelson & Goodwin, 2008).

To give an example, participants B and C both reflected upon their thoughts of ‘self.’ Participant B considering herself as someone who acknowledges the importance of, e.g., recycling and being conscious about the environment. As part of her (until now unconscious) consumer goal

she highlighted that *"I do think that I do much good for the environment. I always say to others that you should not throw things away before it is properly broken/worn"*. Concerning mobile phone consumption, this does, however, interfere with one of her recognized, personal lifestyle goals, which is being updated on technological trends. For participant B to obtain and maintain the goal of following these trends, she will have to prematurely perceive and render her mobile phone obsolete as technology continues to advance rapidly. This same reasoning goes for participant A who is interested in following trends in general.

Additionally, and as discussed in section 11.1.1 all participants acknowledged that some of their replaced phones were still usable, albeit not up to their standards, which is also in accordance with obtaining and maintaining an individual goal of the "self."

Some consumers set their own goals, in accordance with the goals of others, or with indifference to others (the latter is more in line with the economic man). Studies done by Gasaway (2017), Schor (1998), Campbell (1995), and Ackerman (1997) state that people typically do not consume with the aim at advancing any goal specifically. Rather, they consume to meet the satisfaction or experiences obtainable from goods, to satisfy needs, or to indulge in personal wants and desires.

However, when individuals indulge in wants and desires, it is typically to fulfill a goal often related to the "self." Thus, participants, who are more than just consumers, are interested in the optimization of a personal lifestyle or living standards it is due to incentives related to personal self-realization.

From the interviews, it became clear that predetermined consumer goals did not influence the majority of participants actions. Instead, they were influenced by the subconscious, or pre-conscious, cues from various external factors. These 'signals to act' nevertheless seemed to be affected by participants self-image, or ego.

"I want what everybody else wants, and I like to follow trends."

– Participant A

"I buy a new phone when I feel like I need an upgrade, but I like to be updated on technological trends."

– Participant B

"I usually get a new mobile phones a gift at the time they start to malfunction. Or if I want a new one."

– Participant C

The possible conflicts between personal- and consumer goals is a challenge in itself, a lack of coordination between consumer goals does, as argued by Gasaway (2017), seem to increase the risk of 'bad outcomes.' The reason is that the goals and priorities of one consumer may be counter to the goals of another. Unlike participant B and C, participant A did not express concern regarding the environment or sustainability in general; *"It does not really affect my actions"*.

As goals consciously and unconsciously guide how individual consumer's attention is directed and how information is perceived, different or changing goals might alter the way a consumer form awareness. Hence, with overarching, common goal(s) in mind, consumers will be able to more efficiently go through the levels of situation awareness mentioned in section 5.2. Acquiring a *clear perception of the elements in the environment, comprehension of the current situation, and projection of future status* will enable consumers to more effectively interpret the information gathered and decide what information is essential for their common goal. Seeing their surrounding environment as a whole consumer's will anticipate possible future scenarios in light of their overall goal(s), and thus determine which actions should be taken.

11.2.2 Steered by Habits

Participant C is used to get mobile phones as gifts. Thus, she does not put any thought into which mobile phone she would like as she is usually gifted the newer models. Participant A is habituated to always having a mobile phone to the extent where instead of providing repair she acquires a brand new mobile phone as "she can not go for long without her mobile phone and does not want to deal with, e.g., slow software." Similar habituated actions are also identified in the short structured interviews where the vast majority of participants never purchased a used mobile phone, never attempted self-repair and placed old mobile phones in an "electronics drawer," without even knowing why.

These findings indicate that the consumption of mobile phones among young adults is often "conveniently" steered by habits. As habits are closely related to unconscious behaviour the findings indicate that participants do not seem to acknowledge the fact that they are indeed consuming a product (Selvefors et al., 2011). Thus, habits might sustain an unfortunate and unconscious distance between consumers and their

mobile phones, as was first mentioned in chapter 5, section 5.4, making it increasingly challenging for consumers to comprehend the connection between individual behaviour and the direct environmental and social impacts (Bhamra et al., 2011, p. 441).

From the findings, the first example where the distance between consumers and their mobile phones became evident was with the example of South African mobile phone providers in section 10.1.1. The services they provide do not only support rampant consumerism and continuous over-consumption of mobile phones by encouraging subscribers to utilize the option of annual mobile phone renewals. They are also part of why the findings reveal a knowledge gap among participants concerning the fact that the decisions they make within each phase of consumption affect the rate at which a product is rendered obsolete.

When respective providers offer these *"Swap"* or *"Svitsj"* services (as provided by Telenor and Telia here in Norway), the result is, as stated by participants in the short structured interview, unconscious actions. Particularly in the phases of acquisition and disposal.

"They [the mobile phone providers] generally provide the newest launched models from the most popular brands."

– Female participant from Cape Town

The Cape Town participants say their mobile phone providers typically have a limited selection of mobile phone brands in stock. As these are likely to be related to which brands or OS's, are accessible, and popular at a particular time, it results in a pre-determined selection of devices.

By having this limited selection of options participants did not have to put in much conscious effort in the acquisition phase, and they were thus not encouraged or motivated to explore alternative, perhaps more sustainable, options. With such seldom exposure to alternative options or new information, consumers will most likely exclusively interact with certain products.

On an additional note, it is also likely that these services impose a great challenge for aspiring businesses to bring more sustainable products (such as the Fairphone) and services into the mass-market.

Another example of consumer-device distancing from the findings is the vanishing self-repair practices and participants insecurity on the topic. At the time of disposal, many participants were not sure about what to do with their device. The raw data findings show that consumer's confusion

leads the vast majority to keep their mobile phones in an "electronics drawer." Overall, only 9/16 participants responded that they had, with one or several of their disposed mobile phones, recycled them as electronic waste, sold them privately or gifted them as a means to prolong their life-span.

11.2.3 Steered by Emotions

Participants are not only concerned with maintaining personal goals regarding self-image and lifestyle, as discussed in section 11.2.1. They are also influenced by the integrated norms of society, in the form of common practice and expectations ("Definition of Norm," 2018).

"I am very influenced by other people, and believe others are too. Everyone wants to "follow the norm" to fit in, always comparing oneself to others."

– Participant B

Throughout their upbringing, people are exposed to situations which help them understand and integrate these norms. Choices, actions and the perception of future situations are fundamentally dependent on and shaped by societal norms and long-standing practices, and today these are exposed to international pressure. This phenomenon of globalization continues to be a key characteristic of our modern world. As the interaction between people worldwide increases, humans take part in the process of convergence and homogenization, steadily becoming more uniform and standardized. Thus, despite the phrase "everyone is unique," much of people's behaviour coincides with the qualities of international conformity. As mentioned in section 4.5, prevailing economic theories do not account for social factors that (might) lead consumers to behave in similar or even identical ways (Fine & Leopold, 1993, p. 50).

I think you can struggle with your own conscience if you're not as good at "caring" about the challenges or problems, like the people around you. No matter what it is about: the environment, animal welfare, human rights, etc.

– Participant C

The quote is an example of how emotions contribute to the maintenance of social norms. Participant C believes that if society cares deeply about

something, she is expected to do the same, and she expects to feel guilty if she does not conform. The emotional experience is an example of how society punishes deviant behaviour and rewards conformity with negative or positive emotions. As the deviant individual, she would feel guilt as a form of social punishment. However, the deviant behaviour will also cause society to project contempt or disgust, which will reinforce feelings of shame, guilt, and embarrassment, further contributing to the punishment.

In the consumption chapter (chapter 4), it is argued that consumer behaviour and preferences are highly interdependent, which is exemplified by the quotes from participant C. However, these interdependencies are inevitably conditional because people have individual beliefs about what others do, think and expect them to do. People also shape their (emotional) preferences in this way (Bicchieri, 2015). An example of conditionality is how many participant quotes begin with “I think.” Hence, with their conditional, interdependent preferences to conformity, it became clear that participants from the three qualitative interviews acted on a desire to gain approval or avoid rejection by others.

“I think friends and your close network has a huge influence on your decision making. I think you measure yourself with the people in your life and adapt, for better or worse.”

– Participant C

This quote shows how a consumer might follow a practice, mainly because they feel intended to, thinking that most other people like it, even if they do not like it themselves. Thaler and Sunstein (2008, p. 59) calls it pluralistic ignorance, and states that it is the reason for the persistence of many social practices. It also shows why participants seem to engage in certain behaviours if they believe others are behaving that way, and (perhaps) expects them to do the same.

“If you care about what other people think about you, then you might go along with the crowd to avoid their wrath or curry their favor.”

– Thaler and Sunstein (2008, p. 54)

As humans, we are easily exploited by the *status quo bias*, as we have a strong tendency to go along with the already established patterns of behaviour in society (Thaler & Sunstein, 2008, p. 8). Called *collective conservatism*, once a practice has become established, it is likely to be

perpetuated, even if there is no particular basis for it (Thaler & Sunstein, 2008, p. 58).

I would like to highlight the evident experience of peer pressure among participants further. It becomes increasingly clear when they give statements like *"I want what others want"* (Participant A), *"I want to follow trends"* (Participant A and B), or participant C's previously cited quote on how she is always comparing herself to others.

The decisions I make are largely influence by others. Isn't everyone's? I think we often do what everybody around us do

– (Participant C)

Wanting what others have, or having a desire to keep up with peers is something all participants were familiar with. As the qualitative interview participants spoke about how these desires originated, however, it seemed that they were mainly encouraged by their sub-consciousness, focused on personal well-being, self-goals, and perceived satisfaction. While participant A revealed that she would sometimes use consumption to counteract feelings of inferiority, as stated by Campbell (1995), neither she nor the other two participants identified the persuasiveness of friends as a forceful influence for their experienced desires. Still, participants, B, and C speculated if *"wanting to fit in"* or *"the desire of having the best or newest device"* could, in fact, be the most influential reason for their unconscious consumption as they both largely recognized the influence of friends and their preferred network.

"I understand that I do not always need to replace or dispose my phones. But as the utility decreases, I am typically more susceptible to experiencing strong need for an upgrade "

– Participant A

The findings continuously show how participant's choices are based on emotions. Gasaway (2016) reminds us that the human brain is an emotional brain and that peoples emotions are critical components in the decision-making process. Thus, it is almost impossible for humans to make decisions solely based on facts, without interference from emotions. For example, all participants expressed frustration regarding the slowing software of their mobile phone, as discussed in section 11.1.1. Additionally, participant A said about her malfunctioning phone that *"I can't go a day*

without, the fear of missing out and related annoyance "makes" me buy a new one." In these cases, the emotions, unfortunately, caused participants to render their mobile phones obsolete. However, it makes a point of how influential emotions are to consumers' behaviour.

In the particular case of mobile phone consumption, these emotional responses continue the exaggerated support of new products. Furthermore, they are relatively spontaneous. Looking at the devices, consumers' emotional brain immediately and automatically trigger responses by shuffling accumulated experiences, testing the "evidence" against a "database" of preferences (our preferences being conscious thoughts from unconscious influences) (iMotions, 2015). The choice of purchasing, or not purchasing, a new product is thus the consequence of conscious thinking, initially based on unconscious emotional responses and influences from past experiences (chapter 5).

More generally, as Homo Sapiens, consumers rely substantially on their emotions. For example, the "first read" of a new situation, or a "first encounter with new people," is centered mainly around emotions (iMotions, 2015). Unconsciously, through experience, emotions lay the groundwork for our future thinking, support decision making, trigger behavioral responses and serve as a source of motivation to select and take appropriate actions (iMotions, 2015).

11.2.4 Steered by the Lack of Knowledge

The three qualitative interview participants and the vast majority of the short interview participants chose to send their mobile phone to an(authorized or third party) repair center as they stated that they did not have the knowledge to conduct self-repair. Additionally, the vast majority of participants collectively, acknowledged that they kept their replaced mobile phones at home in the "electronics drawer" as most did not know what to do with their devices when in the disposal phase.

"I have never tried to conduct self-repair. I don't know why, possibly because of gender norms, and also because of knowledge."

– Participant C

"I still have my old phones. I just keep them as I don't really know what to do. And because I tend to keep a lot of unnecessary things."

– Participant A

"It is not that hard doing the "right thing." We need to remember to not just leave our old mobile phones at home if they are still usable, but replaced. Its so much better to give them away or sell them, but it is still easier to just put it in the drawer."

– Participant B

What these findings have in common and what they reveal is a significant lack of information and hence, a knowledge gap among consumers regarding the fact that decisions made within each phase of consumption are likely to affect the rate at which a product is rendered obsolete.

Acquiring knowledge, participants from the qualitative interviews used their friends and close network as valid and valuable information sources. One participant realized that these sources could be somewhat subjective, but all participants nevertheless considered this information before making what they saw as "an informed choice." Participant B shared her experience of being influenced by her network of friends, to purchase a brand new mobile phone instead of providing maintenance/repair due to time investment and high cost. Whereas participant A and C said that from conversations with friends, they had the impression that *"a brand new mobile phone is significantly better and insignificantly more expensive than a used one"*. Thus, they had never considered purchasing used mobile phones.

While the case of product review websites, as mentioned in the awareness chapter (chapter 5), was not mentioned explicitly in any of the conducted interviews, it is a compelling case to revisit as the majority of these sites are made up of reviews from other consumers. This finding makes it consistent with the valuation of information from social influences and close networks.

"If many people do something or think something their actions and their thoughts convey information about what might be best for you to do or think"

– Thaler and Sunstein (2008, p. 54)

Information and knowledge are also lacking in regards to the power of advertisements. As a typical, inescapable, source of information advertisements creates a consumer demand to satisfy desires for products occurring in the very same advertisements. Additionally, in today's society advertising creates a demand for new products as a part of the process of

production (Ackerman, 1997, p. 654). I want to repeat the case from section 11.2.2 regarding a limited, pre-defined selection of mobile phones in the acquisition phase. I find this to be an appropriate example of how the idea of consumer power to the extent where they determine what goods and services are produced is not entirely correct, and hence that consumers are free to choose, within certain constraints.

"In many areas, ordinary consumers are novices, interacting in a world inhabited by experiences professionals trying to sell them things."

– Thaler and Sunstein (2008, p. 9)

Additionally, advertisements were not the reoccurring theme in the qualitative interviews as I expected it to be. Participant C stated that as she did not trust advertisements to provide correct information, she did not value them as high as information from her close network. She did, however, remember clearly one incident where she took notice of being influenced by an advertisement campaign (a poster in the city centre). The particular campaign made her aware of measures taken by telecommunication companies regarding the *"submission of old or used mobile phones in exchange for a new"*.

"Maybe I took notice because I didn't know what to do with them, and thus just keep them in my drawer at home?"

– (Participant C)

11.2.5 Consumption and Design for Awareness

"I want to know more about the negative consequences our consumption causes. And with that knowledge, I believe I'll be more careful. There have been some campaigns about filing old mobiles in exchange for new, and I have noticed this. Such campaigns does make me more aware."

– Participant C

"I would like to have more information and statistics about the consumption per now and what potential consequences it has. In addition, I would like to have tips and advice on what to do to keep our consumption as environmentally friendly and ethical as possible."

– Participant A

Having identified the four factors developing and maintaining consumers' behaviour the question is how to apply Design for Awareness to intervene in their behaviour efficiently. In order to be motivated to engage in more conscious consumption, all participants identified information and increased general knowledge as a valuable influence. Being provided with information and statistics about topics, such as repair, over-consumption, ethical consumption, the consequences of excessive consumption, etc., participants believed that they would be willing to change their habits and engage in more conscious consumption.

However, it is not very feasible that every choice made by consumers will one day be, not only an informed choice but also a choice that are in consumers best interest (McNeill, 2017; Ackerman, 1997; Princen et al., 2002). Hence, what consumers could benefit from is guidance. Guidance towards making the "correct" and informed choices although they have not gathered all the information on a topic or guidance where the conscious effort put in will be minimal, so they are not prone to new external influences. Additionally, being guided emotionally could be beneficial to make conscious choices, with or with minimal conscience.

As an example, it became clear that for some participants, recycling was clearly not their area of expertise as they did not know what to do with their devices after replacement. Hence, having designers with specific expertise using DfA to guide consumers towards making more informed choices, will easily improve their actions and choices concerning, e.g., recycling.

11.3 Awareness

Recall what was constituted as a part of consumer awareness by van Warmerdam (2018), in chapter 5, related to having a clear perception of one's personality, including thoughts, beliefs, habits, emotions, motivation and one's surrounding environment. These characteristics provide increased support, allowing the consumer to understand other people, how they perceive you, your attitude and your responses to them in the moment.

11.3.1 Incomplete Awareness

Progressing towards raised awareness, or what Briz and Ward (2009), identify as correct awareness, was crucially dependent on discussions concerning individual habits for the majority of participants. As participant struggle to identify and justify their behaviour, it becomes increasingly challeng-

ing a designer to do so on their behalf. Their lack of knowledge seems to be much dependent on the high degree of automation embedded in consumption. By discussing the case, as well as its related and interrelated topics, the reflections of participants became increasingly comprehensive. Eventually, some were able to identify a limited amount of details regarding the underlying meaning and influences that motivate their behaviour and thus make progress towards awareness.

While participants did not have much time to process or interpret the information obtained throughout the interviews, they experienced an increase in their general awareness of personal mobile phone consumption, after our discussions.

Before the interviews, participants unanimously acknowledged that they had been unconscious and incompletely aware of their mobile phone consumption. Although 'incompletely aware' is not included in Briz and Ward (2009) awareness model, I found it important to use a more charged adjective, to more precisely explain participants' state of mind. A surprisingly high number of participants seemed to be 'caught off guard' when they were questioned about their consumption habits.

Though we did not encounter any negative responses during the interviews, we did encounter some discouraged responses. It seemed like participants found the topic of mobile phone consumption to be relatively private and associated with strong emotions, assumptions, and opinions. During the qualitative interviews, it became evident that several participants experienced slight discomfort when discussing personal consumption habits.

I asked participants to further reflect upon their experienced emotions. The participants focused all attention on themselves, evaluating and comparing their previous and current consumption. Some became increasingly aware of the contradiction between their behaviour in practice, and internal standards and values.

Reciting the respective statements of participant B and C below, we see that participant B responded in the form of skepticism and embarrassment whereas participant C encountered a feeling of hopelessness, along with curiosity.

"It's a little embarrassing. I think I do a lot of recycling and I always say that you should not throw things before it is properly broken[...] It's not that hard to do "the right thing""

– Participant B

“I think I should be careful with the cell phone and do more to keep it in good condition (either by repairing myself, running updates, removing unnecessary material that makes the phone peer, etc.). I want to know more about the negative consequences our consumption causes. And with that knowledge, I think I’ll be more careful. Of course I want to keep my consumption environmentally friendly as possible.”

– Participant C

Both participants experienced what we in the chapter on awareness referred to as secondary emotions (section 5.3). Participant B, for example, due to the conflict of personal values and consumption habits, not living up to personal standards. The experience of secondary emotions is also very closely related to the conflict between ‘self’ and consumer goals as discussed in section 11.2.1.

The majority of people have probably experienced this conflict at some point. They are negatively affected when they realize that they are not behaving according to personal standards and expectations. Like the reflections of Silvia and Phillips (2013), these testimonies also reveal that after being made aware, participants seemed to be increasingly motivated to align their behaviour with their standards.

A behavioural change proposed by participants own initiative is undoubtedly the desirable outcome of engaging in the DfA approach as a behavioural intervention strategy. As Max-Neef (1991, p. 113), talks about how stable and long-term changes often are initiated at an individual level. Considering participant B and C this hopefully provides a solid foundation, from which the engagement in more conscious consumption can grow steadily. Max-Neef (1991) further highlights the advantages of adopting a bottom-up approach, like DfA, focusing on self-learning and realization.

Behavioural reflections

On the subject of self-repair of mobile phones, self-doubt was a common reason. It became clear that the majority of participants did not think they had or could obtain the required knowledge or skills to execute repair themselves. This is discussed in chapter 10, section 10.1.1. In fact, from the summarizing table, 10.2, we see that the vast majority of participants had not and would not attempt personal repair as they did not have knowledge about such practices. In the qualitative interviews, participant C reflected upon why she had not attempted self-repair, especially as she mentioned that her father had repaired her phone on some occasions.

"I do not know why I do not [repair], possibly because of the fact that it's not so common to fix it yourself? But I know more men who fix them by hand. I think I'm a bit affected by gender norms here, because there are many things my father and other men in the family fix that me, my sister or my mother would not try to fix ourselves. I just think it's a habit and a bit 'taught' to rather ask my dad or male friends who are particularly interested." (Participant C)

Three was the average number of purchased and owned mobile phones within the last five years among the participants. Therefore, the number of mobile phones that have been in circulation among the participants of the qualitative interviews comes to a total of 24. As we know from table 10.2 and appendix C, all participants stated that they keep the majority of their replaced phones in the "electronics drawer" at home. Some for backup, but others because they are not sure what to do with them.

"I think many do not know about it or where to do it, so it's easier to just put them in a drawer"

– Participant B

"I am not sure what is the best thing to do with the replaced mobile phones"

– Participant C

The majority of participants still do not know what to do with their mobile phones at the time of disposal or replacement. This finding is still the outcome/result after excluding from the total of 74 responses (combined from the qualitative and short structured interviews), those that recycle old mobile phones or like Participant B sell or give away their mobile phones. The lack of knowledge related to recycling causes participants to either hold on to their phones in the electronics drawer, while others throw it in the general garbage. Luckily the latter was only confessed by 3/74 of the interviewed participants.

11.3.2 Optimistic to Change

"Learning from others is how individuals and societies develop"

– Thaler and Sunstein (2008, p. 54)

I want to revisit the importance of social influences because people's self-awareness is closely related to social expectations in society and "doing what others do." As consumers learn from others, they inevitably also adopt some of their biggest misconceptions from others. Social influences, for example, have caused people to have false or biased beliefs (Thaler & Sunstein, 2008, p. 54). The outcome of these learned misconceptions is typically an achieved state of incorrect awareness (Briz & Ward, 2009).

11.3.3 Awareness and Design for Awareness

Being able to change behaviour is indeed closely related to the maintenance of being aware, see section 5.1.

Consumer awareness is significantly dependent on the processing and interpretation of information into usable and correct knowledge and meaning. The in-depth discussions with participants were significant for overcoming this first obstacle towards more conscious consumption, as they comprehended that awareness is dependent on the gathering and processing of information into knowledge. For the majority of consumers, being provided with complete information and having the possibility and time to process this information will lead to raised awareness.

11.4 Towards a More Conscious Consumption of Mobile Phones

*Effective consumer behaviour can only be materialized through
awareness*

– Ishak and Zabil (2016)

Understanding the complex influences of consumer behaviour, and the processes and reasoning underlying consumer actions related to premature mobile phone obsolescence is an area of study still in its infancy (Cooper, 2016). Additionally, there is a lack of knowledge and accompanying understanding about this behaviour throughout the phases of consumption. The need was raised in Cooper (2016), for a study that incorporates the consumption process as a whole. They specified how *"incomplete knowledge of the consumption process as a whole inhibits understanding of underlying meanings and motives of consumer behaviour."* With a focus on the individual consumer my study provides an integrated analysis, considering the many beneficial elements and perspectives of my case in order to contribute to better overall behavioral decision making.

It is challenging to claim whether consumers' behaviour is a result of their complete lack of awareness, their incorrect awareness or their choice of not acting on their correct awareness. Hence, it is equally challenging to decide on how designers can introduce and apply the design for awareness approach to inherently make young adults aware of their unsustainable consumption and thus, influence them to engage in more conscious consumption.

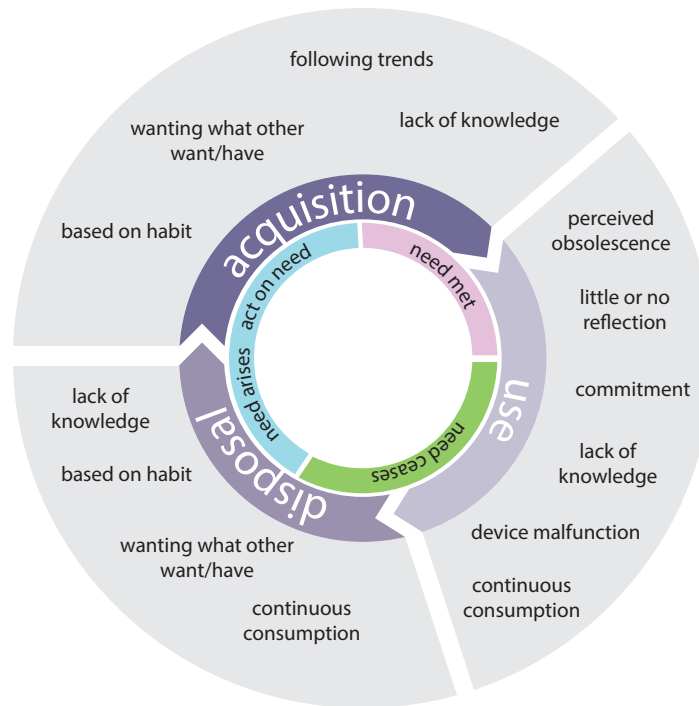


Figure 11.1: A selected presentation of actual consumer influences within the respective consumption phases

This discussion has presented several influences and factors that maintain participant's behaviour (see figure 11.1). I found, three factors were more prominent and common than others. *Consumer emotions*, *knowledge* and *conflicting goals* all seemed to have greater potential as intervention strategies for influencing and raising participant's awareness. With the aim of a long-term goal, intervention strategies might influence the current unconscious consumption or evoke a completely new conscious behaviour (Selvfors et al., 2011).

- **Emotions:** Related to both the participants own emotions, as well as the (perceived) emotions of others. Taking into account the importance of consumers emotions and affections of emotional stimuli on their behaviour, is beneficial when the intent is to raise

their awareness.

- **Lack of Knowledge:** The discussions and findings did not only indicate incomplete knowledge among consumers, but rather the absence of knowledge and awareness of their respective consumption actions and habits. By and large, the findings allowed for a deeper insight into the surprisingly incomplete knowledge of consumers. In fact, not having, or the perception of not having, either correct or enough knowledge was an overall insecurity identified by participants, within various consumption phases.
- **Conflicting Goals:** People's individual goals of e.g., personal well-being, are often in conflict with their consumer goals. It seems that creating, deciding and being in unison about a goal (or goals) everyone understands, and can work together to accomplish, is an important step towards consumer awareness. As engagement can be stimulated by goal setting, it might also increase the motivation of more conscious consumption.

I addressed how Design for Awareness could be applied to efficiently guide consumer behaviour across the consumption phases with basis in these three principal factors. The result is shown in appendix D. While the table only presents a selection of intervention strategies it nevertheless provides an overview and gives an idea of how to effectively influence consumer behaviour.

The Design for Awareness approach was chosen as it took into consideration as many perspectives of mobile phone consumption as possible, and successfully met multiple important criteria for considering obsolescence, consumption, and awareness as co-related as well as co-dependent.

Revisiting the research question of this study in light of theory, findings, and this discussion, I consider the combination of these chapters to satisfyingly establish and illustrate that Design for awareness will likely provide as a useful tool in the transition towards more conscious consumption of mobile phones among young adults.

Chapter 12

Concluding remarks

An enlightened consumer is an empowered consumer.

– Jaswal (2014, p. 340)

Consumers are not as dependent on the various businesses as these same businesses are dependent on the consumer. However, and "*despite the fact that the importance of the consumer is widely recognized, [consumers are] deprived of [their] rights and privilege and is subjected to diverse kinds of exploitation*". As originally spoken by Mahatma Ghandi, from a production point of view, but cited by Jaswal (2014, p. 340), "*we are not doing [consumers] a favor by serving [them]. [Consumers are] doing us a favour by giving us an opportunity to do so*". An enlightened consumer is an empowered consumer, but they must actively participate to increase their knowledge. An aware consumer will be able to protect him- or herself from exploitation and induces general efficiency, transparency and accountability for both consumers and manufacturers in all the phases of consumption.

In the conclusion that follows is focused on applying my interpreted behavioural insights from the empirical data, concerning consumption, obsolescence and awareness to the Design for Awareness approach, in order to show how to engage young adults to more conscious consumption of mobile phones.

12.1 Conclusions

This thesis has presented an exploration of mobile phone consumption from an individual consumers' perspective. The aim was to understand the behaviour of consumers throughout the phases of consumption. By identifying factors which develop and maintain actual consumer behaviour and consumption actions, the study explored if and how Design for

Awareness could engage young adults to more consciously consume mobile phones.

With a basis in a critical-interpretive case study, qualitative research was undertaken. Supplemented with data from my theoretical framework and short structured interviews, I identified expected consumer action and behaviour. Using these findings as a guide for further research, I conducted three qualitative interviews, discussing participants consumer behaviour within the three defined phases of consumption; *Acquisition, use and disposal*.

With a basis in participants' reflections, I analysed the findings by carrying out coding inspired by inductive content analysis. From these findings I identified three prominent factors which influenced consumers' behaviour and actions; *Emotions, Lack of Knowledge and Conflicting Goals*. To explore a proposed framework for design activities and further implementations, I investigated how to efficiently address consumers awareness and motivation in order to make behavioural changes within the phases of consumption. The outcome was various suggestions for intervention strategies on how to raise consumers awareness and stimulate their motivation to engage in more conscious consumption.

This thesis has provided a deeper understanding of the consumption of mobile phones in general. Furthermore, it investigates how awareness can, guide and engage young adult consumers to more consciously consume mobile phones. Applying DfA as an educational and informative intervention strategy for behavioural intervention has provided satisfactory responses from participants.

I investigated how to apply DfA within the proposed design framework in the three phases of consumption. By identifying and targeting the principal factors affecting consumers' behaviour and consumption actions, the consumer was increasingly susceptible to and motivated to change current behaviour.

While I believe DfA will prove beneficial when applied within the various consumption phases and across the three principal consumer influences. I contemplate that to engage consumers to use their alternative way of consuming mobile phones; the long-term effect will be more significant if designers concurrently supplement with the behavioural intervention strategy referred to as a *Nudge*.

The proposed intervention strategies thus confirmed my assumption of consumer preferences towards the opportunity of (self) realization and self-education over forced or persuasive lessons or interventions. Analysis

and discussions revealed the importance of cooperation between designers of behavioural intervention strategies and actual consumers through use studies. Furthermore, the study has found that as designers work with consumers, the revision of proposed changes in their consumption behaviour, should be made conjointly. Additionally, changes should aim at being participatory, as the necessary long-term changes are increasingly dependent on collective consumer awareness and societal motivations.

The relevance of information processing into complete knowledge is recognized and supported throughout the findings. The consumer mind can create an "information picture" that will further guide their behaviour, just like when becoming aware of their environment or 'self.' This overall picture allows consumers to select certain behaviour that they have accepted as appropriate and which clarifies their long-term goals and purposes, both as humans and consumers. Thus, being able to change behaviour is closely related to the maintenance of being aware, see section 5.1

I thus argue that the approach can facilitate for alternative consumer behaviour, with the potential to influence consumers by addressing actual behaviour within the respective consumption phases.

12.2 Contributions

This thesis contributes to the field of design in different ways.

- **Design for Awareness:** is presented as new design approach within DSCB. The study initially provides an understanding of awareness and insight to what is needed to achieve raised consumer awareness. After choosing a product or situation in which it is desired with a reduction of consumption, the findings describe and illustrate how DfA can be efficiently used to influence consumer behaviour and consciously or unconsciously guide them towards engaging in more conscious consumption.

The approach and its efficiency can be explored to greater extent through design activities. These should be tested in practice with actual consumers in real life purchase situations.

- **A better understanding of DSCB:** First of all, looking into the DSCB approach, I acquired knowledge on various behavioural intervention approaches available. Having analysed which factors develop and maintain specific consumer behaviour, I have contributed to

a better understanding of how to efficiently apply the process of DSCB in practice. Based on the identification of critical situations and factors I have provided a solution on how to intervene in consumers' behaviour across consumption phases, to motivate and guide them towards more conscious consumption of mobile phones, by incorporating the DSCB approach with the suitable intervention approach of DfA.

- **Insight of actual mobile phone consumption:** By including actual consumers in my research and engage in qualitative in-depth interviews, my findings have provided valuable insight into prevailing consumption of mobile phones. While they are not generalisable in the broader context, they do describe well the consumption practices of our consumer society is in fact largely based on unsustainable and unconscious consumption of digital consumer goods, such as the mobile phone. Lastly, consumers are open and willing to replace their unconscious behaviour.
- **DfA as a part of DfX:** As a category of DfX, the DfA approach contributes to an understanding of how to efficiently and acceptably intervene in consumers' behaviour. While existing research DfX approaches provide concluding remarks concerning the need for further research on appropriate interventions and intervention levels acceptable across the individual consumer, my second contribution here is a researched approach which received no negative feedback or initial apprehension from participants.

12.3 Further Work

As a contribution to the SMART | Mobile Phone project, I need to address the potential of future work. This study takes steps to understand how design, and particularly Design for Awareness can help young adults to engage in more conscious consumption of mobile phones. By continuing the exploring the knowledge gap between mobile phone consumption, consumer behaviour and consumer awareness to uncover more empirical data on how to efficiently design for awareness.

Additionally, prior to the possible implementation and commitment to the approach, the proposed suggestions on how to apply awareness within the phases of consumption, specifically aimed at the three influential factors of consumer emotions, lack of information, and conflicting goals

should be revised and tested, both with and without the use of nudges. This would be an essential step of further work.

Bibliography

- Ackerman, F. (1997). Consumed in Theory: Alternative Perspectives on the Economics of Consumption.pdf. *Association for Evolutionary Economics*, 31(3), 651–664. Retrieved February 27, 2017, from http://frankackerman.com/publications/economictheory/Consumed_Theory_Perspective_Consumption.pdf
- Aladeojebi, T. K. (2013). Planned obsolescence. *International Journal of Scientific & Engineering Research*, 4(6), 1504–1508.
- Bailey, A. A. (2005, September). Consumer Awareness and Use of Product Review Websites. *Journal of Interactive Advertising*, 6(1), 68–81. doi:10.1080/15252019.2005.10722109
- Beck, J. & Stolterman, E. (2016). Examining Practical, Everyday Theory Use in Design Research. *She Ji: The Journal of Design, Economics, and Innovation*, 2(2), 125–140. Retrieved April 5, 2018, from <https://mail.google.com/mail/u/0/#inbox/162718040ed000cf?projector=1&messagePartId=0.1.1>
- Bhamra, T., Lilley, D., & Tang, T. (2011, December). Design for Sustainable Behaviour: Using Products to Change Consumer Behaviour. *The Design Journal*, 14(4), 427–445. doi:10.2752/175630611X13091688930453
- Bicchieri, C. (2015). *Why Do People Do What They Do? A Social Norms Manual for Zimbabwe and Swaziland*. Innocenti Toolkit Guide from the UNICEF Office of Research. Retrieved April 10, 2018, from <https://repository.upenn.edu/cgi/viewcontent.cgi?article=1000&context=pennsong>
- Billington, L. & Reisegg, Ø. (n.d.). *Wall Street-krakket i 1929*. In *Store norske leksikon*. Retrieved from http://snl.no/Wall_Street-krakket_i_1929
- Bloch, M. (2009, December 5). Perceived obsolescence – fashion and trends | Green Living Tips. Retrieved February 27, 2018, from <https://www.greenlivingtips.com/articles/perceived-obsolescence.html>
- Boks, C., Lilley, D., & Pettersen, I. N. (2017). The Future of Design for Sustainable Behaviour, Revisited. In *Sustainability Through Innovation*

- in Product Life Cycle Design* (pp. 675–689). EcoProduction. Springer, Singapore. doi:10.1007/978-981-10-0471-1_46
- Briz, T. & Ward, R. (2009, June). Consumer awareness of organic products in Spain: An application of multinomial logit models. *Food Policy*, 34(3), 295–304. doi:10.1016/j.foodpol.2008.11.004
- Campbell, C. (1995). The sociology of consumption. *Acknowledging consumption: A review of new studies*, 96–126.
- Car Phone. (2018, February 28), In Wikipedia. Page Version ID: 828157973. Retrieved April 30, 2018, from https://en.wikipedia.org/w/index.php?title=Car_phone&oldid=828157973
- Consumer Meaning in the Cambridge English Dictionary. (2018). Retrieved March 1, 2018, from <https://dictionary.cambridge.org/dictionary/english/consumer>
- Cooper, T. (2016, May 6). *Longer Lasting Products: Alternatives To The Throwaway Society*. CRC Press.
- Crang, M. & Cook, I. (2007, March 12). *Doing Ethnographies*. SAGE.
- Definition of Aware. (2018), In Merriam-Webster. Retrieved March 14, 2018, from <https://www.merriam-webster.com/dictionary/aware>
- Definition of Awareness. (2018), In Merriam-Webster. Retrieved March 14, 2018, from <https://www.merriam-webster.com/dictionary/awareness>
- Definition of Norm. (2018), In Merriam-Webster. Retrieved April 3, 2018, from <https://www.merriam-webster.com/dictionary/norm>
- Endsley, M. R. (2016, April 19). *Designing for Situation Awareness: An Approach to User-Centered Design, Second Edition*. CRC Press.
- Endsley, M. R. & Garland, D. J. (2000). Theoretical underpinnings of situation awareness: A critical review. *Situation awareness analysis and measurement*, 1, 24.
- Facts about the Mobile. A Journey through Time. (2010, August 13). Retrieved February 10, 2018, from <https://web.archive.org/web/20100813122017/http://www.mobilen50ar.se/eng/FaktabladENGFinal.pdf>
- Fine, B. & Leopold, E. (1993). *The world of consumption*. London ; New York : Routledge. Retrieved from <https://trove.nla.gov.au/version/29514001>
- Flyvbjerg, B. (2006, April). Five Misunderstandings About Case-Study Research. *Qualitative Inquiry*, 12(2), 219–245. doi:10.1177/1077800405284363

- Gasaway, R. (2016, September 2). The Role of Emotions in Decision Making. Retrieved March 29, 2018, from <https://www.samatters.com/the-role-of-emotions-in-decision-making/>
- Gasaway, R. (2017, October 13). Competing Goals Can Impact Situational Awareness. Retrieved March 29, 2018, from <https://www.samatters.com/competing-goals-can-impact-situational-awareness/>
- Goodwiin, R. (2017, March 17). The History of Mobile Phones From 1973 To 2008: The Handsets That Made It All Happen. *Know Your Mobile*. Retrieved January 31, 2018, from <http://www.knowyourmobile.com/nokia/nokia-3310/19848/history-mobile-phones-1973-2008-handsets-made-it-all-happen>
- Gutwin, C. & Greenberg, S. (1999). A Framework of Awareness for Small Groups in Shared-Workspace Groupware. In *Computer Supported Cooperative Work*. Kluwer Academic Press. Retrieved March 14, 2018, from <http://grouplab.cpsc.ucalgary.ca/grouplab/uploads/Publications/Publications/2002-DescriptiveFramework.SaskReport1999-1.pdf>
- Headspace. (2015, January 23).
- Hsieh, H.-F. & Shannon, S. E. (2005, November). Three Approaches to Qualitative Content Analysis. *Qualitative Health Research*, 15(9), 1277–1288. doi:10.1177/1049732305276687
- Iachello, G. & Hong, J. (2007). End-User Privacy in Human-Computer Interaction. *Foundations and Trends® in Human-Computer Interaction*, 1(1), 1–137. doi:10.1561/11000000004
- iMotions. (2015, March 31). What are emotions and why do they matter? Retrieved March 29, 2018, from <https://imotions.com/blog/emotions-matter/>
- Inc., A. (2017). Viktig sikkerhetsinformasjon - Brukerhåndbok for iPhone. Retrieved February 27, 2018, from <https://help.apple.com/iphone/11/?lang=nb#/iph301fc905>
- Ishak, S. & Zabil, N. F. M. (2016, June 16). Impact of Consumer Awareness and Knowledge to Consumer Effective Behaviour. *Asian Social Science*, 8(13). doi:10.5539
- Jaswal, D. S. S. (2014). Features and Importance of Consumer Awareness Programme "Jago Grahak Jago" In Indian Society. *International Journal of Social Science and Humanities Research*, 2(4), 340–349.
- Johnsen, R., Olsen, K. W., & Øverby, H. (n.d.). *telefonapparat*. In *Store norske leksikon*. Retrieved April 30, 2018, from <http://snl.no/telefonapparat>

- Keeble, B. R. (1988). The Brundtland report: 'Our common future'. *Medicine and War*, 4(1), 17–25. doi:10.1080/07488008808408783. eprint: <https://doi.org/10.1080/07488008808408783>
- Kirby, J. (2017, December 22). Apple admitted it's slowing down certain iPhones. Retrieved April 6, 2018, from <https://www.vox.com/2017/12/22/16807056/apple-slow-iphone-batteries>
- Leonard, A. (2009, April 22). The Story of Stuff - YouTube. Retrieved February 27, 2018, from <https://www.youtube.com/watch?v=9GorqroigqM>
- Lilley, D. (2009, November). Design for sustainable behaviour: Strategies and perceptions. *Design Studies*, 30(6), 704–720. doi:10.1016/j.destud.2009.05.001
- Lockton, D. (2017). Design with Intent and the Field of Design for Sustainable Behaviour. In D. V. Keyson, O. Guerra-Santin, & D. Lockton (Eds.), *Living Labs* (pp. 75–88). Cham: Springer International Publishing. doi:10.1007/978-3-319-33527-8_7
- London, B. (1932). Ending the depression through planned obsolescence. Retrieved March, 25, 2016.
- Max-Neef, M. A. (1991). *Human scale development: Conception, application and further reflections* (). New York: The Apex Press.
- McNeill, D. (2017, January 18). *Consumption: Competing economic theories*. Retrieved from [https://fronter.com/uio/links/files.phtml/1462164074\\$544548375\\$/Power+points/18.+Jan_Desmond.pdf](https://fronter.com/uio/links/files.phtml/1462164074$544548375$/Power+points/18.+Jan_Desmond.pdf)
- Miemis, V. (2012, June 11). Awareness Design: The Most Powerful Field for Our Future? Retrieved March 21, 2018, from <https://emergentbydesign.com/2012/06/11/awareness-design-the-most-powerful-field-for-our-future/>
- Mooallem, J. (2008, January 13). The Afterlife of Cellphones - Cellular Telephone - Waste Materials - Recycling. *The New York Times: Magazine*. Retrieved February 27, 2018, from <https://www.nytimes.com/2008/01/13/magazine/13Cellphone-t.html>
- Myers, M. D. (2018, March 1). Qualitative Research in Information Systems. Retrieved April 5, 2018, from <http://www.qual.auckland.ac.nz/>
- Nelson, J. A. & Goodwin, N. (2008). Consumption and the Consumer Society. In *Microeconomics in Context*. Routledge. Retrieved March 6, 2018, from http://www.ase.tufts.edu/gdae/education_materials/modules/Consumption_and_the_Consumer_Society.pdf
- oldmanbitter. (2009, July 14). *Motorola DynaTAC*. Retrieved April 30, 2018, from <https://www.flickr.com/photos/13647970@N02/3731103325/>

- Orlikowski, W. J. & Baroudi, J. J. (1991). Studying Information Technology in Organizations: Research Approaches and Assumptions. *Information Systems Research*, 29.
- Øverby, H. (2017, December 14). *Smarttelefon*. In *Store norske leksikon*. Store norske leksikon. Retrieved from <https://snl.no/smarttelefon>
- Pew, R. W. & Mavor, A. S. (1998, July 31). *Modeling Human and Organizational Behavior: Application to Military Simulations*. Washington, D.C.: National Academies Press. doi:10.17226/6173
- Princen, T., Maniates, M., & Conca, K. (Eds.). (2002). *Confronting consumption*. Cambridge, Mass: MIT Press.
- Quan-Haase, A. (2015). *Technology and Society: Social Networks, Power, and Inequality* (2nd ed.). Canada: Oxford University Press.
- Richter, F. (2015, October 6). Infographic: The "Slow iPhone" Phenomenon. Retrieved February 27, 2018, from <https://www.statista.com/chart/2514/iphone-releases/>
- Rochat, P. (2003). Five levels of self-awareness as they unfold early in life. *Consciousness and Cognition*, 12(4), 717–731. doi:10.1016/S1053-8100(03)00081-3
- Rojek, C. (2004). The consumerist syndrome in contemporary society: An interview with Zygmunt Bauman. *Journal of Consumer Culture*, 4(3), 291–312.
- Rouse, M. (2018). *Mobile operating system*. In *SearchMobileComputing*. Retrieved from <http://searchmobilecomputing.techtarget.com/definition/mobile-operating-system>
- Schor, J. (1998). *The Overspent American: Upscaling, Downshifting, and the New Consumer*. Basic Books.
- Selvefors, A., Pedersen, K. B., & Rahe, U. (2011). Design for Sustainable Consumption Behaviour: Systematising the Use of Behavioural Intervention Strategies. In *Proceedings of the 2011 Conference on Designing Pleasurable Products and Interfaces* (3:1–3:8). DPPI '11. New York, NY, USA: ACM. doi:10.1145/2347504.2347508
- Silvia, P. J. & Phillips, A. G. (2013, April). Self-Awareness Without Awareness? Implicit Self-Focused Attention and Behavioral Self-Regulation. *Self and identity : the journal of the International Society for Self and Identity*, 12(2), 114–127. doi:10.1080/15298868.2011.639550. pmid: 23226716
- Solomon, M., Russell-Bennett, R., & Previte, J. (2012, October 24). *Consumer Behaviour*. Pearson Higher Education AU.

- Srivastava, S. & Pandey, S. (2016). Designing for Sustainability: Challenges and Theoretical Considerations.
- Stake, R. E. (2005). Qualitative Case Studies. In *The Sage Handbook of Qualitative Research* (pp. 443–466).
- Statista. (2017). Number of smartphone users worldwide 2014-2020 (in billions). Retrieved November 6, 2017, from <https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/>
- Statista. (2018a). Number of mobile phone users worldwide 2013-2019. Retrieved August 3, 2018, from <https://www.statista.com/statistics/274774/forecast-of-mobile-phone-users-worldwide/>
- Statista. (2018b). Smartphone sales by OS worldwide 2009-2017. Retrieved March 14, 2018, from <https://www.statista.com/statistics/266219/global-smartphone-sales-since-1st-quarter-2009-by-operating-system/>
- Stefansdotter, A., Steen-Knudsen, J., Flack, M., & Hansen, P. G. (2016, June 28). *Nudging for sustainable consumption of electronics*. Nordic Council of Ministers. doi:10.6027/ANP2016-728
- Thorstein Veblen. (n.d.). In G. Stoltz (Ed.), *Store norske leksikon*. Retrieved March 6, 2018, from http://snl.no/Thorstein_Veblen
- Technopedia. (2018). Mobile Phone. Retrieved March 21, 2018, from <https://www.techopedia.com/definition/2955/mobile-phone>
- Thaler, R. H. & Sunstein, C. R. (2008). *Nudge: Improving Decisions about Health, Wealth, and Happiness*. Yale University Press.
- The Light Bulb Conspiracy - Extended Version - YouTube. (2016, August 8). Retrieved February 27, 2018, from https://www.youtube.com/watch?v=ZKLip7Q_Y0s
- Top Five Best-Selling Smartphone Brands. (2017, April 24). Retrieved March 14, 2018, from http://www.chinadaily.com.cn/bizchina/2017top10/2017-04/24/content_29050796.htm
- United Nations. (n.d.). Sustainable development goals. Retrieved May 2, 2018, from <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>
- Valant, J. (2016, May). Planned obsolescence: Exploring the issue.pdf. European Parliament Research Service. Retrieved March 15, 2017, from http://www.europarl.europa.eu/RegData/etudes/BRIE/2016/581999/EPRS_BRI%282016%29581999_EN.pdf
- van Warmerdam, G. (2018). Self Awareness. Retrieved March 2, 2018, from <https://www.pathwaytohappiness.com/self-awareness.htm>

- Weihe, C., Schally, H.-M., & Griesshammer, R. (2016, June). Eco@Work: Obsolescence. The Oeko-Institut. Retrieved from file:///C:/Users/Veronica/Zotero/storage/MZZZTJF4/ecoatwork_02_2016_en.pdf
- Whitbourne, S. (2015, September 19). 5 Reasons We Play the Blame Game. Retrieved December 7, 2017, from <https://www.psychologytoday.com/blog/fulfillment-any-age/201509/5-reasons-we-play-the-blame-game>
- Wilhite, H. (2017, January 16). *Consumption, sustainability and social change*. Retrieved from [https://fronter.com/uio/links/files.phtml/1462164074\\$544548375\\$/Power+points/16.+Jan_Hal.pdf](https://fronter.com/uio/links/files.phtml/1462164074$544548375$/Power+points/16.+Jan_Hal.pdf)
- Woyke, E. (2014, September 9). *The Smartphone: Anatomy of an Industry*. New Press, The.
- Yin, R. K. (2010, January 1). *Qualitative Research from Start to Finish*. Guilford Press.
- Zheng, P. & Ni, L. (2010, July 19). *Smart Phone and Next Generation Mobile Computing*. Morgan Kaufmann.

Appendices

Appendix A

Interview Guide - Short Structed Interviews

Spørsmålsark

Question Sheet

1. Hvor mange mobiltelefoner har du hatt de siste 5 årene?
How many mobile phones have you had during the last 5 years?
2. Hva har vært hovedgrunnen(e) til at du har byttet mobiletelefon?
What was the main reason(s) for replacing the mobile phones?
3. Var mobiletelefonen brukbar da du anskaffet deg en ny?
Was the mobile phone still useable when you replaced it?
4. Har du kjøpt brukte mobiltelefoner?
Have you bought used mobile phones?
5. Hvorfor/hvorfor ikke?
Why/why not?
6. Hva gjør du med din gamle mobiletelefon når du får en ny?
What do you do with your old mobile phone when you get a new one?
7. Har du sendt mobiltelefonen til reparasjon ved en tidligere anledning?
Have you ever gotten a mobile phone repaired?
8. Reparerte du den selv eller sendte du den inn til reparatør?
Did you repair it yourself or did you send it in to a repair centre?

Spørsmålsark

Question Sheet

9. Hvor mange mobiltelefoner har du hatt de siste 5 årene?
How many mobile phones have you had during the last 5 years?
10. Hva har vært hovedgrunnen(e) til at du har byttet mobiletelefon?
What was the main reason(s) for replacing the mobile phones?
11. Var mobiletelefonen brukbar da du anskaffet deg en ny?
Was the mobile phone still useable when you replaced it?
12. Har du kjøpt brukte mobiltelefoner?
Have you bought used mobile phones?
13. Hvorfor/hvorfor ikke?
Why/why not?
14. Hva gjør du med din gamle mobiletelefon når du får en ny?
What do you do with your old mobile phone when you get a new one?
15. Har du sendt mobiltelefonen til reparasjon ved en tidligere anledning?
Have you ever gotten a mobile phone repaired?
16. Reparerte du den selv eller sendte du den inn til reparatør?
Did you repair it yourself or did you send it in to a repair centre?

Appendix B

Interview Guide - Qualitative Interviews

Spørsmål

Intro spørsmål

Kjønn:

Alder:

Når fikk du din første mobil telefon?:

Hva slags telefon har du nå?:

Story-telling

Kan du ta meg gjennom og fortelle om de ulike mobilene du har hatt?

Som for eksempel:

- Når fikk du de?
- Hvor lenge brukte du de?
- Opplevde du noe spesielt med de?
- Hvor lenge hadde du de ulike mobilene? Hvor lenge var de i bruk før du skaffet deg en ny?
- Hva var grunnen til at du skaffet en ny?
- Hvordan skaffet du deg en ny?
 - Kjøpt brukt
 - Kjøpt ny
 - Fikk ny fra operatør gjennom abonoment
 - Fikk i gave (brukt)
 - Fikk i gave (ny)
 - Arvet
 - Ny gjennom jobb
 - Brukt gjennom jobb
 - Annet:

Snakk om den mobiltelefonen du har nå

- Hva var grunnen til at du anskaffet en ny telefon nå sist du anskaffet en?
 - Den nåværende telefonen var mer attraktiv/tiltalende mtp design og/eller funksjonalitet
 - Den nåværende telefonen var en oppdatering/forbedring mtp ytelse
 - Minne på den gamle telefonen var utilstrekkelig/dårlig/fullt
 - Mitt sosiale miljø påvirket meg til å skaffe en ny
 - Fikk en ny telefon i gave
 - Min mobilleverandør tilbød meg en oppgradering
 - Den tidligere mobiltelefonen var ikke lenger opp til mine standarder
 - En ny modell kom ut
 - Annet:
- Til hvilket formål skaffet du mobiltelefonen?

Dersom ødelagt eller ikke fungerte

- Hva var det mer spesifikt som var ødelagt?
- Vet du hvordan det ble ødelagt?
- Hvordan oppdaget du at det var noe feil med telefonen?

- Hvordan opplevde du det?
- Hva gjorde du da du fant det ut?

Dersom ønsket en ny

- Hva var bedre med den nye/ønskede telefonen?
- Var det noe feil med den forrige?
- Hvorfor valgte du å bytte ut mobilen din akkurat når du gjorde?
- Hvordan reagerte venner og familie på oppgraderingen av mobiltelefonen?
- Hvorfor gikk du til anskaffelse av akkurat denne telefonen?
- Hva var kriteriene for mobiltelefonen du skulle kjøpe?
- Vurderte du å kjøpe en brukt mobiltelefon?

Dersom arvet/gave

- Hva synes du om gaven eller det å arve en mobiltelefon?
- Hvem ga den til deg?
- Visste han/hun at du trengte eller ville ha en ny telefon?

Hva gjør du med de gamle telefonene, når de ikke lenger er i bruk?

Sett ja for det som passer deg.

- Har de hjemme:
- Kastet i generelt avfall:
- Resirkulert:
- Solgt til privatperson:
- Solgt til resikuleringsbedrift:
- Byttet mot en ny telefon:
- Gitt bort i gave:
- Donert bort:
- Den ble mistet eller stjålet:
- Annet, spesifiser:

Hvis den ligger hjemme, hvorfor?

- Backup/ekstra mobil i tilfelle primærtelefonen går i stykker
- Bruker den som en sekundærtelefon
- Jeg vet ikke hva jeg skal gjøre med den
- Den innehar mye viktig data og informasjon
- Jeg har tenkt til å selge den
- Jeg glemmer at jeg har den
- Den er ikke verdt noe
- Jeg har beholdt den for reservedeler
- Jeg har tenkt til å kaste den

Jeg skal nå lese opp påstander og du kan sette et kryss på arket for de du er enige i, mtp din forrige mobil:

- Den var vellaget
- Med denne telefonen følte jeg ikke lenger at jeg var "up-to date" mtp teknologien
- Eksteriøret på mobiltelefonen var i dårlig stand

- Mobiltelefonen fungerte uten feil som funksjons- eller systemfeil
- De fleste jeg kjenner hadde en mer moderne telefon
- Mobiltelefonen var robust
- Mobiltelefonen var ikke kompatibel med de nyeste enhetene og programvaren
- Mobiltelefonen var teknologisk utdatert
- Mobiltelefonen fikk meg til å virke gammeldags
- Jeg likte ikke å bytte ut mobiltelefonen
- Jeg likte å bytte ut mobiltelefonen
- Mobiltelefonen falt ofte i bakken
- Mobiltelefonen var kjedelig å bruke
- Mobiltelefonens design og funksjoner kunne endres
- Jeg likte godt å bruke mobiltelefonen

Reparasjon

- Hvor ofte har du hatt tidligere mobiltelefoner til reparasjon?
- Hvorfor valgte du reparasjon?
- Har du selv prøvd å reparere?
- Hvorfor/hvorfor ikke?
- Kunne din forrige telefon vært reparert?
- Hvorfor har du eventuelt valgt å ikke reparere?

Mer generelle spørsmål

- Prøver du å holde deg oppdatert på de nyeste teknologiske trendene?
- Etter din mening, hvor lenge bruker andre sin mobiltelefon før de bytter den ut?
- Tror du at du bruker din mobiltelefon kortere, like lenge eller lenger enn andre?
- Hvor long lasting er mobiltelfoner synes du?
- Hvor lenge forventer du at en mobiltelefon skal vare?
- Hvor lenge forventer du at din nåværende mobiltelefon skal vare?
- Har dine forventninger og preferanser angående mobiltelfoner endret seg over tid? Eventuelt hvordan?

Om awareness:

- Blir du mer obs på eget konsum av mobiltelefoner etter spørsmålene?
- Eventuelt hvorfor?
- Hvordan påvirker dette deg?
- Hva tror du kunne måtte til/påvirket deg til å gjøre en endring i ditt konsum?

Dersom ingen forslag på hvordan endre, si ja eller nei og utdyp gjerne angående forslagene under:

- Rett informasjon/nok informasjon/mer informasjon
- Flere mer bærekraftige mobiltelefoner
- Billigere reparasjon
- Lære hvordan reparere selv
- Mobilleverandørene må gjøre sine telefoner mer bærekraftige

- Flere valg/mer informasjon om mulige valg fra telefonselgere eller leverandører som for eksempel at en selger informerer om billigere reparasjoner i stede for å påvirke til å kjøpe ny telefon?
- Kanskje hvis venner eller kjente hadde gjort det samme.
- Annet, utdyp:

Being aware

- Hvordan tenker du at bevisstgjøring av konsum og konsumvaner kan påvirke til faktisk endring?
- Hva tenker du ellers kunne bidratt til en endring i egne konsumvaner?
- Man snakker om at man ikke er klar for eller ønsker en endring for å gjøre konsumet av mobiltelefoner og teknologi mer bærekraftig? Hva tenker du om det?
- Hvor stor rolle tror du venner og omgangskrets har på beslutningene man tar?
- Hvorfor har de/har de ikke stor påvirkning?

Appendix C

Summary - Qualitative Interview Findings

	Participant A	Participant B	Participant C
Acquisition	<p>At time of purchase: She wants what everybody else wants and likes to follow trends in general.</p> <p>Purchased a new one because she could not go a day without a mobile phone.</p> <p>Purchasing used mobile phones: The price of a new is only a little higher than a used one, thus she would rather buy a brand new mobile phone.</p>	<p>At time of purchase: She purchases a new mobile phone when she felt she needed an upgrade.</p> <p>Likes to be updated on the new technological trends</p> <p>Usually purchases mobile phones that has a "good price" or the best price for the model.</p> <p>Purchasing used mobile phones: Never thought about purchasing a used mobile phone as she would rather purchase a new phone.</p>	<p>At time of purchase: Has only been gifted phones</p> <p>She is gifted a new mobile phone when her current is starting to malfunction and/or she wants a new one</p> <p>A family member who gifts the mobile phones likes to be updates on technological trends, so she might get new phones because of new models being launched, but she is not very interested in the trends.</p> <p>Says she is not concerned about technological trends, but are typically gifted the newest models.</p> <p>Purchasing a used mobile phone: Has never purchased a used mobile phone, said it was because a new one only costs a little more, so she would rather invest in a brand new one.</p>
Use	<p>Reasons for replacement: Broken hardware affected functionality and general use.</p> <p>Thinks she does not really care much about the technological trends, but is influenced by friends and surrounding to keep mobile phone up-to-date.</p> <p>Say she does not care so much about functionality upgrades or visual exterior</p> <p>Did not really care that she needed to replace her mobile phone.</p> <p>Sometimes I do not think I need to replace the mobile phone, but things like software updates make it slower and I do not want to deal with that.</p> <p>Expected life-span Expect a mobile phone to last for about 5 years.</p> <p>Uses her phone for as long as others.</p> <p>Says that if others kept their phones for longer she would probably too since she does not want to feel like she is "just breaking it right away".</p> <p>Once damaged her phone to get a new one.</p> <p>Repair will extends life span, but it is too expensive with Apple.</p>	<p>Reasons for replacement: Replaced her mobile phones because of slow software, broken hardware, battery malfunctioning and broken unspecified as it randomly went black.</p> <p>Replaced her mobile phones because she wanted a new one.</p> <p>She did not like to change the stolen mobile phone because she thought it was robust and easy to use.</p> <p>Thinks younger people are more heavily influenced in general, to keep their phones updated by the newest model, while adults might care more about the software updates and what the phone is capable of.</p> <p>Expected life-span: Typically uses a mobile phone for 1-2 years and believes other uses it for approximately as long.</p> <p>Thinks she uses her mobile phone for as long, or longer than other consumers.</p> <p>She expects the mobile phone to last between 3 and 4 years.</p> <p>Does not think mobile phones are very long lasting, but that the "old" mobile phones, before smartphones, were</p>	<p>Reasons for replacement: Replaces mobile phones because she lost them, water damage, broken hardware, lack of storage, battery malfunctions, but mainly because of slow software.</p> <p>Replaced mobile phone because she wanted a new one.</p> <p>Did not replace her mobile phone because of new functionality as she was never truly impressed with them and not particularly interested</p> <p>In most cases she liked replacing her mobile phones.</p> <p>She has experienced more attention and curiosity from others when she got newly released mobile phones.</p> <p>Expected life-span: Expects mobile phones to last around 5 years.</p> <p>Think others have their mobile phones from 3-5 years before replacing.</p> <p>Thinks she used her phone for a shorter time than others did a few years back. With time, she has become more careful with her phones and now uses them as long as others.</p> <p>She thinks that cheaper or easier access to repair</p>

	<p>Thinks that more information about choices and options and consumption might be life-span optimizing.</p> <p>Functionality She overall expects more from her mobile phones as the technology develops, "now it must take panoramic pictures and function as a camera, before you were only going to text".</p> <p>Values new exterior features like: better camera, bigger screen and storage space are more important than software updates.</p>	<p>Thinks mobile phones gets slow and worn very quickly.</p> <p>She thinks that cheaper or easier access to repair options or information from sales people would be life-span optimizing.</p> <p>Thinks there is a need for more sustainable mobile phones.</p> <p>Functionality: Values a good quality camera and long battery life.</p> <p>Liked the upgraded size of her new phones and its easy-to-use factor, "it has everything I need".</p>	<p>options or information from sales people about how to repair yourself would be life-span optimizing.</p> <p>Thinks there is a need for more robust and sustainable mobile phones.</p> <p>Functionality: Storage, internet, camera and access to music is her priority functionalities.</p> <p>Thinks that she now has lower expectations to functionality like battery-life, durability and the time it will take for the phone to break.</p>
Disposal	<p>Repair: Do not have the knowledge to repair herself and says she would never try as she is not tech-savvy.</p> <p>Always try to repair, or repair mobile phones at a repair shop before eventually, with time, buying a new device.</p> <p>Has once chosen not to have her mobile phone repaired due to high cost. Chose to purchase a new one instead as third parties only provide bad screens which breaks within no time.</p> <p>Did not repair mobile phone because it would too much time without phone.</p> <p>Usability when disposed: Some were old and not usable, like touchscreen not working due to broken screen.</p> <p>Some were not up to her standards.</p> <p>After disposal: Keeps mobile phones around the house. She does not know why she has kept them but that she forgets she has them when they are not in plain sight.</p> <p>One was given to a family member .</p>	<p>Repair: Has had her mobile phone repaired at repair centre because of no response, battery drainage and slow software.</p> <p>Repaired her mobile phone at a certified repair centre to get it fixed a couple of times, because of warranties</p> <p>Has also chosen not to repair and just bought a new mobile phone as it was "outdated anyways".</p> <p>Would probably not repair her phone herself, as she does not have the knowledge, but if she did know how she would like to try.</p> <p>Usability when disposed: The mobile phones were not up to her standards.</p> <p>After disposal: The mobile phones are kept in a drawer at home.</p> <p>Has her mobile phones at home, because she wants them as backup if her current phone stops working.</p> <p>She has sold one phone privately.</p> <p>She thinks many do not know that recycling mobile phones is an option and nevertheless where to recycle them.</p>	<p>Repair: Has never repaired herself, but her father has both repaired/tried to repair the mobile phones, but he is not always successful.</p> <p>Father has replaced battery and screen once, two different phones</p> <p>Repaired phone battery in a repair centre once.</p> <p>Say she would not repair her phone herself, as she has never done it before and does not have the equipment to repair. Sees the time investment of personal repair as a drawback factor.</p> <p>Might be influenced by typical non-repair practises and gender norms. she only knows of male friends who repair their own mobile phones.</p> <p>Usability when disposed: The mobile phones were not up to her standards, she experience that all phones are very slow and are lagging.</p> <p>Say she does not know if her the mobile phones could be repaired .</p> <p>The state of the mobile phone might vary. Depends on how "picky" she is and her patience with the devices.</p> <p>After disposal: She keeps her old phones at home in the "tech-drawer" as her father likes to keep everything as backup or for spare parts in case something else breaks.</p> <p>She is not sure about what is best to do with the old phones.</p>

Appendix D

Behavioural intervention strategies based on DfA

Phases of consumption	Principal Factors Affecting Consumer Behaviour		
	Lack of Knowledge	Emotions	Conflicting Goals
Acquisition	<p>Transparency on repair or alternative models: being provided with an option of purchasing a used mobile phone.</p> <p>Tailored consumer information such as labelling: inspired by smoking packages mobile phones using conflict minerals should have the same.</p> <p>Availability of choices: consumer should be free to choose.</p> <p>Recognizing for example the modularity of a Fairphone in contrast with the non-modular iPhone</p>	<p>Visual advertisements specifically aimed at social consumption.</p> <p>Advertisement saying “most people prefer our product”.</p> <p>Consumers’ selective retention makes them susceptible to information relevant to our own interests: Let consumers know about modular phones when they complain about broken components of their current device.</p>	<p>Consumers act in ways that make them feel good about themselves: advertising “feel-good” recycling advertisement.</p> <p>Connecting conscious consumption with a higher purpose, such as the concern of sustainability.</p>
Use	<p>Information about repair or maintenance.</p> <p>Public repair. My supervisor has engaged in “Fiksefest” where anyone can come to try repair their</p>	<p>Not only providing consumers with subscriptions that last for years, but by making “subscriptions” to mobile phones for a pre-set time.</p>	<p>Consumers could be making commitments: consumer are typically stay consistent of the commitment is made public.</p>

	<p>different technological devices. With or without help from the “fixers”.</p> <p>One of the reasons for Telenor’s “Swap” service was to enable consumer to recycle their old mobile phones. However, consumers became instead inspired to swap their mobiles phones every year, as they could just give it back.</p>	<p>After X years of use the consumer could be awarded or at the very least acknowledged.</p> <p>Having a higher price for less sustainable mobile phones and acknowledging that the price is higher due to the premature obsolescence.</p>	<p>Playing on consumers’ emotions and preventing premature mobile phone obsolescence displaying for example, how much less CO2 have been emitted because you chose to provide maintenance to your phone instead. Visualise by numbers gives the consumers something more to hold on to and which makes them feel good about themselves.</p>
Disposal	<p>Making it easy to recycle electronics: putting up mobile phone recycling stations, as we do for clothing that is rendered obsolete.</p>	<p>Choosing to conduct maintenance or repair could earn consumers acknowledgement or perhaps benefits with their mobile phone provider?</p> <p>Easily available video tutorials showing how easy it is to provide self-repair, might build up consumer confidence and have them engage in repair.</p>	<p>Providing consumers’ with information about, for example, how much longer their mobile phone could be useful if repair or maintenance was conducted instead of disposal might cause emotions of guilt as discussed within the qualitative interviews.</p>