



UNIVERSITY OF GOTHENBURG
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To Adopt or Not to Adopt, That is the Question

An Analysis of Drivers and Barriers for Adoption of Virtual Fitting Rooms in
the Swedish online fashion retail market



Bachelor Thesis in Corporate Sustainability

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Source figure: Pngtree, n.d.

Abstract

The immense increase in returns amongst Swedish online fashion retailers has given rise to severe challenges, not least from a sustainability perspective. Several studies have shed light to Virtual Fitting Rooms (VFRs) as a potential solution for reducing online returns. However, as of today, only a limited number of Swedish fashion online retailers have adopted the technology, and even in those cases, customer usage has been low. Therefore, the aim of this thesis is to create an understanding into the drivers and barriers that influence the adoption or rejection of VFRs among consumers in the Swedish online fashion retail market. The methodology employed in this thesis takes a qualitative approach based on 15 semi-structured interviews incorporating a visual elicitation technique. The results suggest six drivers that encourage adoption of VFRs, rooted in intrinsic and extrinsic motivation. Further, the results suggest eleven barriers impeding the adoption of VFRs, divided in functional-, psychological- and situational barriers. The theoretical contribution of this thesis includes the introduction of a third category, situational barriers, in addition to the widely recognized functional- and psychological barriers. This thesis also holds practical implications since the drivers and barriers discovered can be used to develop VFRs tailored to consumer needs. This in turn can enhance adoption and encourage sustainable consumer behavior.

Keywords: Virtual Fitting Rooms, sustainability, online returns, technology adoption, resistance to adoption, consumer behavior

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1. Introduction

This chapter is divided into three sections. The first section provides a background to the thesis by addressing the widespread issue relating to online returns. The second section presents the problem statement of this thesis, which sheds light to an interesting research field concerning the introduction and execution of VFRs in the Swedish market. Finally, the third section of this chapter presents the purpose of this thesis.

1.1 Background

PostNord's latest e-commerce report (2022) presented that Swedish retail online in 2022 reached a market size of 136 billion SEK. This represents a growth of approximately 2600 percent compared to the market size of 5 billion SEK in 2003 (PostNord, 2022). This growth in retail online has been accompanied by increased return rates (e.g., Cullinane et al., 2019a; Frei et al., 2020). Fashion goods account for the product category with the highest number of online returns in Sweden, with approximately one third of all items being returned (Cullinane et al., 2019a). According to Cullinane et al. (2019a) there is a prevailing "return culture", in modern society. This trend reflects a change in consumer buying behavior, where consumers routinely order several garments to try on at home, keep one, and send the other items back to the retailer.

The consequences of this growth in online returns does not only entail costs for businesses, handling returns, but also cause substantial negative environmental externalities (Bring, n.d; Cullinane, 2019a). The movement of goods throughout the supply chain, in both forward and reverse directions, causes significant emissions of greenhouse gases, thereby contributing to the acceleration of global warming (Bring, n.d). Furthermore, the environmental consequences of online returns are often exacerbated by environmentally inefficient return processes (Cullinane, 2019a). Returned products are often transported long distances to be handled in countries like Poland, Estonia or Asia in order for companies to minimize costs. Thus, the same product is usually transported all over the globe several times before ending up with a customer (Cullinane, 2019a). In addition, Frei et al. (2020) accentuate that an increased amount of returned products does not end up with a new consumer after being returned, but becomes waste contributing to growing landfills. Furthermore, the authors emphasize that this contributes to resource depletion, as products being thrown away contain

important, and often scarce, resources (Frei et al, 2020). Thus, not only does increasing return flows contribute to climate change, but also entails other negative environmental externalities, such as the generation of waste and contribution to resource depletion. These factors all contribute to returns being a severe challenge for online retailers (Frei et al, 2020).

According to Cullinane et al. (2019a), there are multiple factors contributing to the large number of returns within the Swedish online fashion retail market. One contributing factor is the free return policies offered by several Swedish companies. Free return policies have proven to encourage purchase and thus serve as a tool to gain competitive advantage (Cullinane et al., 2019b). This was confirmed by a survey conducted by PostNord (2018) indicating that approximately 30 percent of respondents had refrained from purchasing from an online retailer due to the absence of free returns. Therefore, despite the significant financial and environmental expenses that e-retailers incur with free return policies, companies tend to preserve policies in fear of losing market share to competitors (PostNord, 2021). Furthermore, the authors highlight incomplete product information as another important factor contributing to increased return rates (Cullinane et al., 2019b). This factor is further emphasized by Gustafsson (2021), investigating fit-uncertainty reducing interventions in retail, pointing out that approximately 50 percent of all returns are caused by fit-uncertainty.

While a majority of companies are well-aware of the issue of increased online return rates, they seem to lack adequate solutions to reduce its negative environmental consequences (Hellström et al., 2017). Cullinane et al. (2019a) accentuate the importance of online retailers, transport providers and customers working together to reduce the environmental impacts of returns. Online retailers must find ways to manage returns more efficiently, while encouraging consumers to reduce their return rate (Cullinane et al., 2019a). The authors describe that technical solutions, such as virtual fitting rooms (VFRs) could provide a tool to facilitate sustainable consumer behavior. Sustainable consumer behavior is described as behavior that meets the present needs while simultaneously limiting the environmental impact (Trudel, 2018). The potential of VFRs to reduce the number of returns, and hence the environmental impacts caused by these, is further emphasized by Gustafsson (2021). The author emphasizes product-fitting as an important pre-sales activity in order to reduce fit uncertainty, and subsequently cutting return rates.

The phenomena of VFRs originated in approximately 2005, and gained substantial attention after 2010, coinciding with the rapid expansion of e-commerce (Dawndasekare et al., 2016). The tool allows consumers to try on items without physically handling them, through the use of simulation techniques that enables a customized shopping experience (Lee et al., 2020). There are currently different forms of VFRs available in the market which vary in level of sophistication. The more sophisticated VFRs show the apparel either on the user or on a virtual avatar, both adjusted to accurately reflect the users body characteristics whilst the less sophisticated solely provides a size recommendation (Gültepe & Güdükbay, 2014). Despite the fact that the technology has been available in the marketplace for a considerable duration, it remains in the nascent stages of consumer adoption in several countries, in accordance with Lee et al. (2020). The authors emphasize that the technology is widely implemented in many Asian countries, as compared to western countries where the technology is implemented to a lesser degree.

1.2 Problem Statement

From the previous section it is possible to visualize that online returns will remain an issue for companies and the environment if not addressed. Due to the harmful environmental impacts caused by online returns (eg. Bring, 2023; Cullinane et al., 2019a), measurements must be taken within the area to achieve the Sustainable Development Goal 12 of responsible production and consumption (UN, 2023).

Several studies have shed light to VFRs as a potential solution for reducing returns (e.g. Cullinane et al., 2019a; Gustafsson, 2021). In addition, in 2018 the Swedish fintech company Klarna ranked VFRs in the top three among fashion retailers' plans for the future (Klarna, 2018). Despite this, little progress in terms of implementation in the Swedish online fashion retail market has occurred. In accordance, Gustafsson (2021) highlights that only a limited number of Swedish retailers have adopted the technology, and even in those cases, customer usage has been low. Hence, the implementation of VFRs has not been seamless in the Swedish online fashion retail market. Gustafsson (2021) therefore emphasizes that research is needed to examine what factors cause this low customer usage of VFRs and what is required for these technological interventions to successfully be adopted by consumers.

The challenge of implementing products successfully in the market is not exclusive to VFRs. In today's society consumers are overwhelmed by technical innovations, and the majority of

innovations brought to the market fail (Antioco & Kleijnen, 2009). Conventional research has emphasized consumer adoption as a fundamental factor for the development and success of technical innovations (Sanakulov, 2015). Furthermore, research has accentuated the importance of understanding consumer resistance to technological innovations. Attention is called to identifying factors impeding adoption of new technology (Ram & Sheth, 1989; Antioco & Kleijnen, 2009).

Although technology adoption and resistance to innovations are recognized as comprehensive research fields, there is a significant need for an in-depth understanding of the factors that influence consumer adoption and resistance to innovations. Vogelsang et al. (2013) emphasize that previous studies within the field have predominantly employed quantitative methodologies, hence leaving out important aspects of the issue. The authors accentuate the importance of qualitative research in order to investigate the complex relationship between human and technology. Further, the importance is particularly highlighted for relatively unexplored technologies, as relying solely on theory-based models, without considering empirical data, may lead to overlooking important aspects influencing adoption (Vogelsang et al., 2013).

The prevailing circumstances highlighted above, sheds light to an interesting research field concerning the introduction and execution of VFRs in the Swedish online fashion retail market. Based on the need for an in-depth understanding of the factors influencing adoption and rejection of VFRs, this thesis employs a qualitative methodology to explore the implementation of VFRs in the Swedish online fashion retail market.

1.3 Purpose

The purpose of this thesis is to create an understanding of the drivers and barriers that influence the adoption or rejection of VFRs among consumers in the Swedish online fashion retail market.

Research Question 1: *What are the drivers for consumers' adoption of VFRs?*

Research Question 2: *What are the barriers for consumers' adoption of VFRs?*

2. Theoretical Framework

This chapter is divided into two sections based on the research questions of the thesis. The first section constitutes the theoretical framework for research question 1, focusing on drivers for technological adoption of VFRs. The second section constitutes the theoretical framework for research question 2, focusing on the barriers impeding adoption of VFRs.

2.1 Drivers for Adoption of Technology

A substantial amount of research has sought to investigate the adoption process of new technology (Lee et al., 2022). The concept of technology adoption is defined as the “stage of selecting a technology for use by an individual or an organization” (Carr, 1999). Models that are frequently applied within the field of technology adoption are Theory of Planned Behavior (TPB), Technology Acceptance model (TAM), Unified theory of acceptance and Use of technology (UTAUT), Diffusion of Innovation (DOI), and Motivation Model (MM) (Sanakulov, 2015). Technology adoption has been studied within a variety of domains and various drivers for technological adoption have been identified (e.g., Kwon et al., 2000; Lule et al., 2012; Lu et al., 2019; Trevino et al., 1992; Lee et al., 2019; Willems et al., 2017). Several studies emphasize perceived ease of use and perceived usefulness as important drivers of technology acceptance and intention to use innovations (e.g., Kwon et al., 2000; Lule et al., 2012). Furthermore, research has, for a considerable duration, indicated that perceived enjoyment is a crucial factor that determines people's willingness to adopt technology (e.g., Trevino et al., 1992; Lee et al., 2019). Moreover, Willems et al. (2017) found that a primary reason for adopting retail technologies is the fact that they enable timesavings.

The diffusion of VFRs has been studied multiple times in recent years, with the majority being based on quantitative methodologies (Lee et al., 2022). Previous quantitative research has shown various drivers affecting the consumer intention to adopt virtual VFRs (e.g., Li & Xu, 2020; Lee et al., 2020; Huang & Qin, 2011). Research emphasizes that perceived ease of use, perceived usefulness and perceived enjoyment constitutes determinants of consumer adoption of VFRs (Li & Xu, 2020; Lee et al., 2019). Additionally, Lee et al. (2020) emphasize technology visibility and consumer awareness as significant drivers explaining consumers' intention to use VFRs. Further, it is emphasized that social influence and perceived risk are two determining factors influencing intention to adopt VFRs (Huang & Qin, 2011).

Beyond the quantitative studies within the field, Lee et al. (2022) have conducted an exploratory qualitative study, investigating consumer perceptions of VFRs. The study identified three drivers influencing consumers' intention to adopt VFRs: utilitarian benefits, experiential benefits, social benefits. The first category, utilitarian benefits, refers to perceived consumer usefulness and time- and effort saving benefits. The second category, known as experiential benefits, pertains to the role of perceived enjoyment in driving consumer adoption of VFRs. The third category, social benefits, depicts that consumers might adopt VFRs due to the opportunity to socialize with others.

Furthermore, Gustafsson (2021) refers to Gelbrich et al., (2017) and suggests that incentives provided by retailers, such as a discount or free returns, can influence consumers' intention to adopt uncertainty-reducing interventions, such as VFRs.

2.1.1 Motivation Theory

When investigating the drivers that influence consumers' decision to adopt or reject VFRs, motivation theory provides a relevant perspective. Deci and Ryan (2000) describes that motivation theory aims to explain why people make certain choices and behave in a certain way. The authors described motivation as a main determinant in shaping an individual's behavior, as it strongly influences decision to act. Furthermore, it is emphasized that two types of motivation exist: *intrinsic motivation* and *extrinsic motivation*, where the distinction is based on the underlying motive or objective of an action (Deci & Ryan, 2000). Motivation theory has been widely adopted in a wide array of research fields. Davis et al. (1992) used the theory to understand the adoption of computers in the workplace, and since then the theory has been frequently employed within the research field of technology adoption.

In accordance with Deci and Ryan (2000) intrinsic motivation can be defined as “the doing of an activity for its inherent satisfactions rather than for some separable consequence” (p.56).

It is emphasized by the authors that an individual experiencing intrinsic motivation is motivated by the activity itself, and the inherent enjoyment and satisfaction of the activity, rather than an external reward or separate outcome of completing the action. Furthermore, in the context of technology adoption, Davis et al. (1992) described intrinsic motivation as the enjoyment people derive from utilizing technology. The authors emphasize that intrinsic motivation plays a significant role in predicting usage intentions

Deci and Ryan (2020) accentuate that intrinsic motivation is driven by several factors, such as the feeling of autonomy, competence and relatedness. The first factor, autonomy, is described as an individual's perceived control over their actions and the possibility to make decisions that align with the individual's values and beliefs. The second factor, competence, refers to the feeling of development and growth. Finally, the third factor, relatedness, refers to a feeling of belongingness (Deci & Ryan, 2020).

Extrinsic motivation is defined as the doing of an activity to attain a certain outcome, or reward (Deci & Ryan, 2000). Thus, in contrast to intrinsic motivation, extrinsic motivation is derived from achieving a desirable outcome, rather than the activity itself. With regards to adoption of technology, Davis et al. (1992) emphasize that extrinsic motivation refers to the ability to achieve a certain outcome such as improved performance, higher pay or promotion. The authors further accentuate that an extrinsic motivator is the perceived usefulness of the innovation in performing the individual's tasks. Another extrinsic motivator highlighted by the authors is the introduction of an external reward to encourage a certain behavior.

2.2 Barriers for Adoption of Technology

Despite the potential benefits of adopting new technologies, the majority of innovations do not reach market acceptance (Antioco & Kleijnen, 2009). It has been argued that consumer resistance is a major reason for innovation failure (Ram & Sheth, 1989). Thus, theories have investigated factors causing individuals to resist technological innovations (Ram & Sheth, 1989; Antioco & Kleijnen, 2009). Anticio and Kleijnen (2009) assert that consumer resistance is marked as consumers' non-intention to adopt novel technology. Various studies have identified a range of different barriers to adoption of technologies (Cham et al, 2021; Yen et al., 2016, Alalwan et al, 2015). Cham et al. (2021) identified that two important barriers influencing adoption of mobile payment are perceived complexity and privacy risk. The first barrier identified, perceived complexity, is defined as the difficulty in using the innovation, but can also refer to the difficulty in understanding the idea of the innovation. The second barrier, privacy risk, is denoted as the possible exposure of an individual's private information through the usage of technology. In addition, Rijdsdijk and Hultink (2003) identified perceived risk as a potential barrier causing consumer resistance. In their study, perceived risk is referred to as the ability to use technology successfully. Furthermore, several studies indicate habit as a barrier for adoption of new technology (Yen et al., 2016, Alalwan

et al., 2015). Additionally, Lu et al. (2019) discovered that context specific factors such as facilitating conditions affect consumers' resistance to technology.

Previous studies on the diffusion of VFRs has shown various barriers impeding adoption. Lee et al. (2022) revealed two categories hindering the adoption: technical concerns and personal concerns. Technical concerns encompass consumer anxiety of whether the intervention will provide a desirable experience. Further, personal concerns pertain to consumer insecurities about the time and effort needed to learn the technology and the need to input body metrics (Lee et al., 2022). In addition, Gustafsson (2021) emphasizes the fact that determination of fit is subjective in nature, as a factor impeding adoption of VFRs. Hence, the author explains that consumers may perceive a correct recommendation from the VFR as a non fit, due to personal preferences.

2.2.1 Resistance Theory

When investigating the barriers that influence consumers' decision to adopt or reject VFRs, resistance theory provides a relevant perspective. As previously mentioned, consumer resistance constitutes a significant factor in explaining technology failure, and can assume both passive and active forms amongst individuals (Antioco & Kleijnen, 2009). Ram and Sheth (1989) accentuate that consumer resistance to innovations can be divided into functional barriers and psychological barriers. The authors suggest that, in order for an innovation to reach success, overcoming both functional- and psychological barriers is crucial. These two types of barriers are widely recognized as the most significant factors in explaining consumers' reluctance to embrace technological innovations (Herbig & Day, 1992).

Functional barriers arise as people evaluate the consequences of adoption (Antioco & Kleijnen, 2009). Functional barriers can be divided into three categories: usage barriers, value barriers and risk barriers. The former category, usage barriers, occurs when an individual encounters situations where the new innovation is in conflict with existing usage patterns or habits. The authors emphasize that consumers tend to favor established practices, hence to gain acceptance an innovation must provide significant value. Usage barriers thus contribute to the explanation of why new innovations tend to have a relatively long development process before gaining consumer acceptance (Ram & Sheth, 1989).

The second category of functional barriers, value barriers, refers to the notion that if an innovation does not offer additional value over existing innovations, incentives for consumers to change does not exist (Ram & Sheth, 1989). The latter category of functional barriers, risk barriers, is considered as a severe impediment for consumer adoption of technologies. Almost exclusively, all innovations involve some degree of risk (Ram & Sheth, 1989). In turn, Ram and Sheth (1989) emphasize that this risk causes individuals to avoid new innovations until they learn more about it. There exists several risk dimensions, and one dimension that is highlighted by Ram and Sheth (1989) is performance risk. This category of risk is referred to as the difficulty amongst individuals to grasp the functionality of the innovation due to the arisement of several insecurities. In these situations incomplete information is a significant factor (Ram & Sheth, 1989).

In accordance with Antioco and Kleijnen (2009) psychological barriers arise when users experience conflicts with prior beliefs. Other studies have referred to psychological barriers as arising when the perceived attributes of an innovation causes psychological conflicts or problems for consumers (Heidenreich & Handrich, 2015). Ram and Sheth (1989) divides psychological barriers into two categories: *tradition barriers* and *image barriers*. The former is referred to as the notion that individuals tend to experience discomfort when a deviation from established tradition occurs. The authors emphasize that traditions are deeply embedded in society and challenges to these can result in strong reactions from consumers, including negative word-of-mouth and boycotts. The latter category of psychological barriers, image barriers, highlights that the possession of an unfavorable image can negatively influence adoption intentions of technology (Ram & Sheth, 1989).

In addition to the functional- and psychological barriers emphasized by Ram an Sheth (1989) a third category, situational barriers, forms the theoretical framework of this thesis. This category is supported by previous research that has indicated that context specific factors such as facilitating conditions affect consumers' resistance to technology (Lu et al., 2019). Based on these findings, identified by Lu et al. (2019), a description of situational barriers has been formulated for this thesis: Situational barriers arise due to a specific situation or context that hinder individuals from adopting the technology.

3. Method

The aim of this chapter is to enhance the reliability and transparency of the study by describing how the study has been conducted and justifying the choices made. The first section presents the research design employed in this thesis. Thereafter, a discussion of the data collection is presented, followed by an explanation on how the data was processed and analyzed. Finally, the research quality of this thesis is discussed.

3.1 Research Design

This thesis aims to create an understanding of the drivers and barriers that influence the adoption or rejection of VFRs. As this implies understanding consumers' perceptions and opinions of VFRs, a qualitative research design is suitable (Bryman & Bell, 2017). The qualitative research design is further justified by the desire to create new insights regarding consumer adoption or rejection of VFRs, rather than testing already existing knowledge. In accordance, Bryman and Bell (2017) emphasize that a qualitative research design allows for flexibility and openness to the perspectives of interviewees.

The research design of this thesis takes an abductive approach. The abductive research approach is a combination of the inductive- and deductive research approaches and entails continuous switching between theory and empirical data (Patel & Davidsson, 2019). In accordance with the abductive approach, the theoretical framework was developed throughout the entire process of the thesis, which is further discussed in section 3.3 Data Analysis.

3.2 Data Collection

This thesis is based on primary data. To support the collection of data an iterative approach was employed. In accordance with Bryman & Bell (2017) the iterative approach involves the process of refining and making adjustments continuously throughout the research process as new insights emerge.

3.2.1 Semi-structured Interviews

The data was collected through semi-structured interviews, incorporating a visual elicitation technique. Using semi-structured interviews is appropriate as it puts emphasis on the

interviewees own perceptions and viewpoint This is desirable as the thesis aims to understand consumers' perceptions and opinions of VFRs. In addition the interview technique is suitable as it allows for flexibility as well as comparability (Bell & Bryman, 2017). By addressing predetermined themes, comparability between interviewees was allowed, while keeping the questions open enough to gain deep understanding of the subjects. Hence, these themes provided some degree of structure to the interviews, without limiting the interviewees' thinking. In situations where a new dimension was addressed during the interviews, follow up questions were raised to create a deeper understanding of the underlying barrier to the usage of VFRs.

3.2.2 Visual Elicitation

During the interviews interviewees were provided with a link to access a VFR, allowing them to try out the tool. This technique of visual elicitation refers to the introduction of visual mediums into interviews, in order to encourage discussion about the interpretation of the research phenomena (Given, 2008). This is suitable as VFRs are a novel phenomena and knowledge about the tool is limited. Furthermore, this technique is appropriate as it allows for observation of potential obstacles encountered by the interviewees in respect to the functionality of the VFR.

The selection of a suitable VFR for the interviews was influenced by two factors. First, since VFRs are a fairly new phenomena that is not widely implemented in Sweden, the choice was based on availability. Second, since this thesis examines consumer adoption of VFRs in Sweden, it is considered important not to use a VFRs that differs extensively from the VFRs offered in Sweden. Thus, a VFRs that has clear similarities with the tools that are currently available in the Swedish market was chosen. With these factors in consideration, a VFR providing the consumer with a customized size recommendation was chosen. The size recommendation provided by the tool is based on a body scan consisting of two pictures of the consumer from different angles. Below the functionality of the VFR chosen for this thesis is introduced step by step.

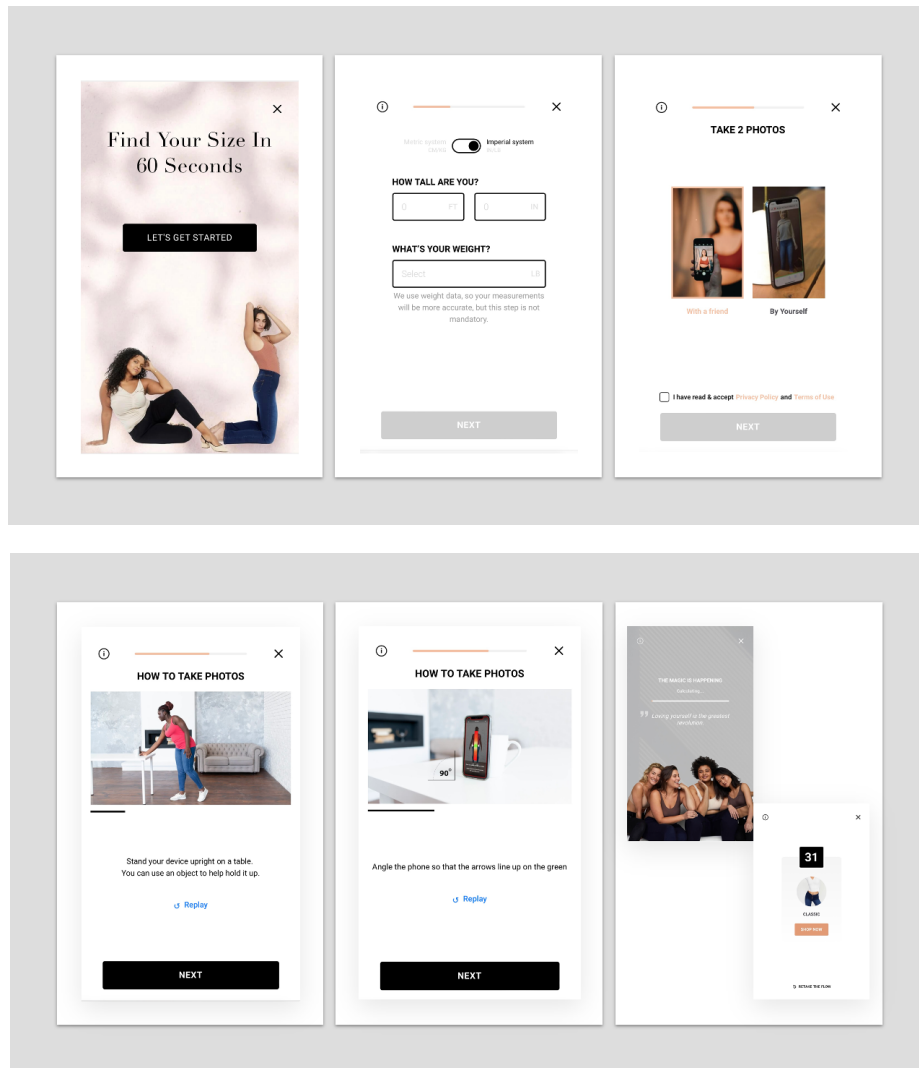


Figure 1: Virtual Fitting Room

3.2.3 Sampling Strategy

For this thesis, 15 interviews were conducted with women between the ages of 18 and 29 who regularly purchase fashion apparel online. The rationale behind this selection is that women within this specific age span constitute the segment that causes the most online returns in Sweden (Postnord, 2022). Since this study focuses on VFRs in relation to online returns, investigating this particular segment is relevant.

The sampling strategy is based on a snowball selection technique. In accordance with Bryman & Bell (2017) this technique involves initially selecting a small group of people who are relevant for the research questions, and then asking them to recommend other participants who possess relevant experiences or traits for the inquiry. The first step in the sampling strategy was to establish the selection criteria. Three selection criteria were established: 1).

Women, 2). *Age 18-29*, 3). *Frequent purchasers of fashion apparel online*. Using these criteria, interviewees were selected based on their ability to contribute to enhance the understanding of the drivers and barriers influencing adoption of VFRs. Initially, three interviewees that fulfilled the criteria were contacted and interviewed. After the performance of each interview, the interviewee was asked to recommend an individual fulfilling the above criteria. Hence, the sampling increased along with new suggestions. This continued until saturation was reached, which resulted in a total of 15 interviews.

Interviewees	Age
1	23
2	21
3	29
4	22
5	22
6	26
7	23
8	21
9	27
10	25
11	22
12	21
13	19
14	24
15	22

Table 1. Interviewees

3.2.4 Pilot Interview

For this thesis two pilot interviews were conducted to ensure that the questions were properly understood, avoid confusion and reduce the risk of bias in the questions (Bryman & Bell, 2017). Patel och Davidsson (2019) emphasizes that pilot interviews serve as a good preparation for conduction of interviews. Based on the feedback that arised, novel issues were addressed and the interview guide was revised. The adjustments included both reformulation of questions as well as reduction of the scope and number of questions. The empirical data generated from the pilot interviews were excluded from the data analysis. This since the pilot interviews were primarily used as a preparation for the conduction of interviews.

3.2.5 Interview Guide

To ensure the provision of valuable data and establish favorable conditions for thematic analysis, a pre-designed interview guide was used as the basis for the semi-structured interviews. The interview guide was divided into 4 main themes: *consumer behavior*, *return behavior*, *personality traits* and *sustainability*, and *virtual fitting rooms*. Based on these themes, sub-questions related to each theme were developed. The purpose with these questions was exclusively to provide support to the predefined themes. Therefore, not all questions were addressed during the interviews. The questions within each theme were open-ended to facilitate flexibility in the interviewees' answers (Bryman & Bell, 2019). Thus, the interviewees were given large freedom to formulate their answers within the scope of themes. Hence, the interviews were conducted with a low degree of structure to allow for flexibility and the opportunity to discover new dimensions.

3.2.6 Conduction of Interviews

In the conduction of interviews several practicalities have been thoroughly considered to enhance the reliability of the thesis. With reliability in consideration, the interviews were conducted face to face. This since face-to-face interviews tend to be more fruitful as they enable interpretation of the social context (Bryman & Bell, 2017). Further, to facilitate that the interviewees spoke unhindered, all interviews were conducted in the interviewees native language, Swedish. Hence, all quotes have been translated. The translations have been performed with high precision and only smaller modifications have been made to increase the readability.

Before the interviews were initiated interviewees were informed about ethical considerations. Initially, the interviewees were provided with a clarification that the data gathered in the interview will solely be used for the purpose of this study. Further, the interviewees had to give their consent to the interviews being recorded and transcribed. Additionally, the interviewees were informed that their participation is anonymous.

When addressing the fourth theme in the interview guide, virtual fitting rooms, visual elicitation was used. Whilst the interviewees were trying out the VFR, they were observed and notes were taken. To prevent biasing the interviewees' answers, the point in time for introducing the VFR is crucial. Therefore, the tool was purposely introduced after having

addressed the previous three themes; consumer behavior, return behavior, and personality traits and sustainability.

3.3 Data Analysis

All interviews conducted were recorded and transcribed. According to Patel and Davidsson (2019) converting the recorded data into written text facilitates the processing and analysis of the collected material. As an initial step to organize the data, keywords that summarized the content of different parts of the interviews were attached as notes using the comment function provided by Google Drive.

Once the transcription of interviews was completed, the data was analyzed using thematic analysis. Braun and Clarke (2012) describe thematic analysis as the process of systematically organizing data into patterns by searching for underlying themes in the data set. This allows for the identification of themes that can later be related to broader theoretical or conceptual issues (Braun & Clarke, 2012). Several themes were identified in relation to the two research questions posed by the thesis. The identified themes of barriers and drivers for adoption of VFRs were further grouped into categories based on their underlying cause. The process of data analysis is illustrated by the following table exemplifying how the analysis of barriers was conducted. Similar thematization technique was used for analyzing drivers.

BARRIERS		
CATEGORIES	THEMES	QUOTES
Functional	Lack of Additional Value Doubts of Accuracy Time-consuming Established Shopping Habit	"If the VFR only provides a size recommendation, then I could just as well measure myself." "I feel some skepticism about this. How is it supposed to depict my size and body type with only two pictures?"
Psychological	Negative Preconceptions of Size Guides Lack of Personalisation Body Anxiety Privacy Concern	
Situational	Location Constraint Contextual Constraint Lack of Visibility	

Table 2: Data Analysis

As previously mentioned, this thesis is characterized by an abductive approach. This was shown not least in the process of thematization. The categorization of themes was initially based on Ram and Sheth's (1989) distinction of functional- and psychological barriers. However, as the empirical data was analyzed some dimensions could not be accounted for by the two categories. Therefore the theoretical framework was complemented with a third category of barriers, situational barriers, in order to create an understanding of the empirical findings. This category is supported by previous research that has found that context specific factors influence adoption of technology.

3.4 Research Quality

To assure the research quality of this thesis Lincoln and Guba's (1985) criteria for qualitative studies has been considered. The authors refined the concept of trustworthiness by suggesting four alternative criteria to the established quantitative concepts of validity and reliability: credibility, transferability, dependability, and confirmability.

The first criteria, credibility, refers to the degree to which the result of the research can be trusted (Bryman & Bell, 2017). This criteria was operationalized through continuously summarizing the interviewees answers and asking them whether the interpretation was accurate. This was done to avoid potential misinterpretations and allowed the interviewees to modify their answers to assure that their answers were properly understood. This aligns with what Lincoln and Guba (1985) describes as member-checking, aiming to test the interpretations with the participants. Further, credibility was considered through dual analysis meaning that both researchers have analyzed the results. This allowed for dual interpretation before conclusions were drawn.

The second criteria, transferability, refers to whether the results can be transferred to other situations and contexts (Bryman & Bell, 2017). The criteria was considered by the provision of rich and specific descriptions of the research phenomena. This aligns with Lincoln and Guba's (1985) concept of thick description, aiming to facilitate the process of accessing the extent to which the results can be transferred to other contexts. In this thesis this is exemplified by the inclusion of an illustrative description of the specific VFR used for this thesis, provided in section 3.2.2. The inclusion of an illustrative figure of the VFR provides the reader with an overall understanding of the tool used. Hence, the reader can draw conclusions on whether the results generated in this thesis can be transferred to other VFRs.

The third criteria, dependability, refers to the extent to which the same results can be obtained if the research was repeated (Lincoln & Guba, 1985). This has been operationalised through the provision of a thorough and transparent description of the methodology employed in this study. In accordance with Lincoln and Guba (1985) this allows the reader to examine the research process.

Finally, the fourth criteria, confirmability, refers to the extent to which the findings are connected to the empirical data, rather than shaped by the researchers values and biases (Lincoln & Guba, 1985). This criteria has been considered by continuously demonstrating how decisions have been made. To exemplify, the data analysis was demonstrated by the provision of an illustrative figure, clearly demonstrating the approach for analysis. In accordance with Bryman and Bell (2017) this contributes to the objectivity of the research.

4. Empirical Findings

This chapter is divided into two main sections based on the two research questions of this thesis. The first section, presenting different themes of drivers identified in the interviews, is further divided into two categories: intrinsic- and extrinsic motivation. The second section, presenting different themes of barriers identified in the interviews, is grouped into three categories; functional-, psychological- and situational barriers. Based on the empirical findings, the following figure has been conducted summarizing the drivers and barriers for each category.

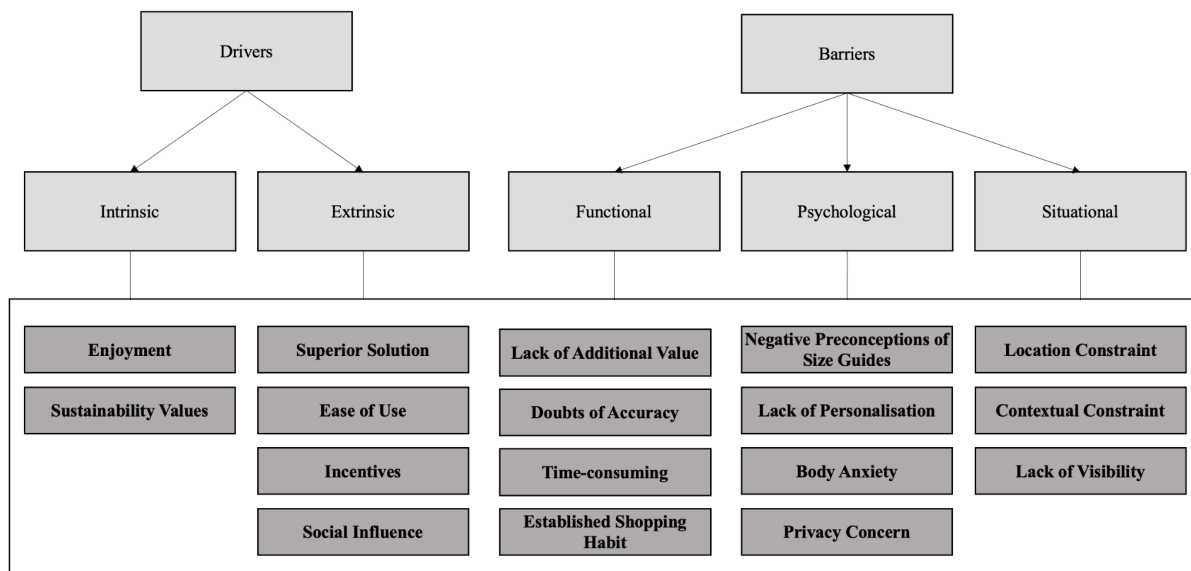


Figure 2: Empirical Findings

4.1 Drivers for adoption of VFRs

In total, this thesis has identified six drivers encouraging adoption of VFRs. These drivers are divided into two categories: intrinsic motivation and extrinsic motivation. Two drivers rooted in intrinsic motivation have been identified: *enjoyment* and *sustainability values*. Further, four drivers rooted in extrinsic motivation have been identified: *superior solution*, *ease of use*, *incentives* and *social influence*.

4.1.1 Intrinsic Motivation

Enjoyment

One identified driver for adoption of VFRs is the enjoyment derived from utilizing the tool. Several interviewees expressed that they found it enjoyable to use VFRs and that the tool would enhance the pleasure derived from their online-shopping-experience. The driver of enjoyment can be exemplified by interviewee 1 expressing: “ I thought it was fun, I laughed when I used it”. Furthermore, interviewee 4 confirmed this by expressing: “this was definitely a more entertaining way of finding my size than what I am used to”. This reasoning highlights the enjoyment derived from using the tool, acting as a driver for adoption.

Sustainability Values

It was evident that sustainability values constitute a factor driving adoption of VFRs. Some interviewees expressed significant concerns about the wide-spread environmental issue of online returns in today’s society. As a result, interviewees were motivated to use the tool due to the feeling of making sustainable choices. This was exemplified by interviewee 12 expressing: “Since I consider myself sustainability concerned, this tool would allow me to make sustainable choices, which of course feels good”. Hence, sustainability values act as a driver for adoption of VFRs due to the feelings derived from making sustainable choices.

4.1.2 Extrinsic Motivation

Superior Solution

One driver encouraging adoption of VFRs is the perception of the tool as a superior solution, providing the user with more benefits than currently available tools. Several interviewees emphasized that they would utilize the tool if it offered unique features, not offered by already existing tools. It was further suggested that one such feature could be the possibility to virtually try on clothes, to see what the garments looked like on their body. In line with this reasoning interviewee 3 expressed: “I would have considered this solution to be great if it allowed me to see the clothes on. Then I would certainly use it. But if it only provided me with a size-recommendation, I would not consider it good enough.” Moreover, with regards to this, interviewee 7 stated: “I would certainly consider using this kind of tool if it allowed me to see how the clothing fits my body.” This reasoning emphasizes the perception of the tool as a superior solution as a factor driving adoption of VFRs.

Ease of Use

Numerous interviewees emphasized that a driver for adoption of VFRs is that the tool is quick and easy to use. This was exemplified by interviewee 15 expressing: “For me, a crucial factor for using this kind of tool is convenience, I want my purchase to be quick.” Furthermore, in line with this reasoning, interviewees indicated that they would be more likely to adopt the VFR, if it allowed them to save the body-scan, thereby eliminating the need to repeat the procedure every time they purchase an item. This was exemplified by interviewee 14 expressing: “If the body scan had to be performed for each product considered, I would consider it as too inconvenient.” This sheds light on ease of use as a crucial factor driving adoption of VFRs.

Incentives

Some interviewees stated that incentives, provided by companies, constitute a driver for adoption of VFRs. Interviewees suggested that companies can incentivize adoption of VFRs by providing other benefits to consumers, such as discounts or free returns for customers who use the tool and encounter size issues. This was exemplified by interviewee 15 expressing: “If the company said that if you use the virtual fitting room and the items don't fit, then you get your money back, I would have actually been motivated and felt that I had received some incentive to try it out.” This reasoning emphasizes the provision of external incentives as a driver for adoption of VFRs.

Social Influence

Another driver encouraging adoption of VFRs is social influence. Some interviewees stated that the adoption of the tool could positively contribute to how they are perceived by others. Specifically, it was emphasized that adoption of the tool could result in others perceiving them as more innovative. In line with this reasoning interviewee 2 expressed: “One appears to be more up to date with technologies, smart and digital.” This exemplifies social influence as a driver for adoption of VFRs.

4.2 Barriers for Adoption of VFRs

In total, this thesis has identified eleven barriers impeding adoption of VFRs. These barriers are divided into three categories: functional-, psychological-, and situational barriers. Four functional barriers for adoption of VFRs have been identified: *lack of additional value*,

doubts of accuracy, time consuming and established shopping habit. In addition, four psychological barriers have been identified: *negative preconceptions of size guides, lack of personalisation, body anxiety and privacy concerns.* Lastly, three situational barriers impeding the adoption of VFRs have been identified: *Location constraint, contextual constraint and lack of visibility.*

4.2.1 Functional Barriers

Lack of Additional Value

One of the identified barriers for adoption of VFRs is the lack of perceived additional value. Almost all interviewees expressed that they did not think that the VFR offered any extra benefits, beyond the already available solutions, such as size charts, product descriptions and reviews. This reasoning aligns with interviewee 4 stating that: “If the VFR only provides a size recommendation, then I could just as well measure myself”. In addition, interviewee 14 expressed similar concerns stating: “This particular tool did not bring me any new insights.” This reasoning highlights that if consumers do not perceive the tool as offering additional value, resistance to adopt the technology occurs. Hence, lack of additional value acts as a barrier impeding adoption of VFRs.

Doubts of Accuracy

Additionally, doubts of accuracy were identified as a potential factor impeding adoption of VFRs. Interviewees emphasized several factors that all contributed to doubts of accuracy. These doubts refer to an overall skepticism towards the potential of the VFR to provide a correct size recommendation. The first factor contributing to accuracy concerns was the clothing worn during the body scanning process. Interviewees emphasized that there was a lack of information regarding what to wear when conducting the body scan. Thus, numerous interviewees wore loose-fitting clothes when trying the VFR, which caused doubts regarding the potential of the tool to provide interviewees with a precise size recommendation. This was exemplified by interviewee 15 expressing: “I’m thinking, now that I have a large shirt on, will it really be accurate.”

The second factor that caused accuracy concern amongst interviewees was the perception of the tool being too generic. Numerous interviewees expressed doubts regarding the ability of the VFR to accommodate unique body characteristics. With regards to this, interviewee 2

expressed: “I know that I have long legs, big thighs and a narrow waist, and then it almost always goes wrong. So no, I wouldn't trust that it would be right. I think it is too general”. Hence, interviewees raised doubts of the potential of the VFR to provide an accurate size recommendation that considers their unique body characteristics.

The third factor contributing to interviewees experiencing doubts of accuracy was the perceived difficulty to grasp the functionality of the VFR. In accordance with this interviewee 5 emphasized: “I feel some skepticism about this. How is it supposed to depict my size and body type with only two pictures?” Further, when interviewees were asked whether they would trust the size recommendation provided by the VFR, interviewee 12 expressed doubts, stating: “I prefer to understand how things work before using them, and in this case, I think the process went a bit too fast.” Hence, the lack of understanding of the underlying functionality of the VFR, caused interviewees to question the performance of the tool, and hence its accuracy.

Time-consuming

Another barrier for adoption of VFRs is the perception of the tool as being time-consuming. Several interviewees emphasized that a fast and seamless shopping experience is of great importance when buying clothes. They further stated that additional steps that must be completed before purchase are often perceived as burdensome and time-consuming, causing them to avoid them whenever possible. Some of the interviewees specifically stated that time constraints constitute one of the main reasons why they refrain from using size charts provided by companies. This was exemplified with interviewee 3 stating: “Even when the company has a size guide with different measurements, I rarely bother to pick up a measuring tape to measure myself”. In line with this reasoning, interviewee 10 also emphasized time as one of the factors that could hinder usage of VFRs: “ It sounds super silly because it didn't take that long, but all extra steps before purchase I would perceive as complicated and inefficient”. This reasoning accentuates the perception of the tool as being time-consuming, acting as a barrier impeding adoption of VFRs.

Established Shopping Habit

Another barrier impeding adoption of VFRs is the interviewees' habit to try on and purchase clothes in-store in situations where they prioritize finding the correct size. With regards to this interviewee 1 expressed: “I like to make more complicated and expensive purchases

physically to be able to try the garment on and see how it fits. I want to ensure that it will be right from the beginning.” This exemplifies the habit of trying on and purchasing clothes in physical stores when prioritizing finding the correct size.

Furthermore, several interviewees emphasized that buying clothes in-store is associated with additional benefits, besides finding the correct size, which contributes to the continued habit of buying in-store. One advantage that was commonly referred to, was that shopping in-store provided them with pleasure and enjoyment. In accordance, interviewees 6 expressed: “I think that if it is possible to try the garment in store I would always prefer that. I think that there is something more to shopping for clothes than just doing it purely instrumentally.” This reasoning highlights why consumers tend to maintain their habit of shopping in physical stores due to the additional advantages offered by this experience.

4.2.2 Psychological Barriers

Negative Preconceptions of Size Guides

One of the psychological barriers identified is negative preconceptions of size guides. Several interviewees emphasized that they had negative experiences with different size guides in the past, since they rarely turned out correct. In line with this interviewee 2 expressed: “I rarely use the size guides provided, as they usually do not turn out correct”. This previous negative experience with size guides was further emphasized by interviewee 13 expressing: “I usually don’t trust the recommendation provided by size charts. I am aware that I am 182 cm tall and then the outcome rarely turns out correct.” Hence, interviewees emphasized a general distrust in size guides, which caused them to question the potential of VFRs in offering improved results.

Lack of Personalisation

Another psychological barrier identified in this thesis is the perception of the tool as lacking personalisation. Several interviewees expressed concerns regarding the tools failure to consider individual preferences. Interviewees emphasized that fashion, at its core, is driven by personal taste, hence some people might prefer an oversized fit, whilst others prefer a slimmer fit. Consequently, interviewees emphasized that even if VFRs provided them with an accurate size recommendation, it does not imply that the size aligns with the individual's preferences, as VFRs might hold different opinions regarding what constitutes a proper fit for

a garment. In accordance, interviewee 7 emphasized that: “Even if the VFR thinks a certain size would fit me, I might feel that I want my jeans to be looser, or tighter. So the tool might have completely different opinions about what is a good size than I have.” Furthermore, similar concerns were expressed by interviewee 8 stating: "It all depends on how you want it to fit. Just because a computer recommends a size, it doesn't mean that's how I want the garment to fit me.” This reasoning emphasizes the perception of the VFR as lacking personalisation as a barrier impeding its adoption.

Body Anxiety

Another barrier hindering the adoption of VFRs is the perception of the VFR as provoking body-anxiety. Several interviewees explained that various factors contributed to them feeling uncomfortable in utilizing the tool.

One of the factors emphasized was that interviewees experienced it as psychologically distressing to receive a size recommendation from the VFR. This was exemplified by interviewee 9 expressing: “It feels terrible that a computer should tell you what size you are, it might recommend a number that I don't find flattering at all.” In line with this, interviewee 11 described her own experience of the issue from having previously worked in a clothing store: “I know how sensitive it can be among customers to be told that they should go up a size. With all the complexes that exist, I want to know for myself what size I am, I don't want someone to tell me that I am a size large, medium or small.” This reasoning emphasizes that that distress arose amongst consumers due to the fear of the VFR recommending a size that did not feel flattering or did not align with their own perception of their body.

Another contributing factor to interviewees experiencing the tool as anxiety provoking is the experienced discomfort generated by posing and being exposed to pictures of themselves from unflattering angles. With regards to this interviewee 3 expressed “As a woman, I don't think it was super nice to see myself in a front cam when I don't wear make-up, my hair is disheveled and I am in my leisure wear. And this is usually how I look when I shop for clothes online.” This exemplifies the discomfort arising from posing and being exposed to pictures from unflattering angles as a factor contributing to body anxiety.

Privacy Concern

Additionally, privacy concern was identified as a psychological barrier impeding adoption of VFRs. Several interviewees expressed insecurities about how the images captured by VFRs are processed and stored, with many raising concerns about the integrity of personal data. In line with this, interviewee 7 expressed: “My immediate concern was; where are these pictures stored? The handling of these pictures wasn’t clear to me. So privacy issues are of concern, as the images reveal some information about my appearance.” Consistent with this reasoning interviewee 9 expressed: “One concern for using the tool is the policies regarding storage of the images. I would say that this is my biggest concern.” Thus, uncertainty regarding storage of the pictures caused privacy concerns, which made interviewees hesitate to utilize the tool.

Furthermore, it was emphasized that if interviewees had distrust for the company providing the VFR, they would refrain from utilizing the tool out of privacy concerns. Interviewees stated that they are unwilling to provide the company with personal information if they did not believe that the company is reliable. In accordance with this, interviewee 10 expressed: “I wouldn’t conduct the body-scan if it was a shady website. I would never risk that. So, the credibility of the website would be crucial for me.” Hence, distrust for the company providing the tool caused privacy concerns, acting as a barrier for adoption.

4.2.3 Situational Barriers

Location Constraint

One of the situational barriers impeding adoption of VFRs is location constraints. Throughout the interviews it was revealed that interviewees often order online when they are in places where they are unable to conduct a body-scan, making the location from where consumers order online a barrier to adoption of VFRs. In line with this, interviewee 8 expressed: “One obstacle I see with the tool is that you have to be in a place where you can set up the camera and take a picture of yourself. You might be sitting on the bus and ordering and in these situations it might not be so easy to set up the camera.” Furthermore, besides the practical aspect of the location, several interviewees emphasize that it would not feel appropriate to conduct the scanning in front of a lot of people. This was exemplified by interviewee 11 expressing: “It feels like a requirement to perform the body scan at home in a quiet environment. I would not feel comfortable conducting the body scan in a public environment

with a lot of people watching.” This reasoning accentuates the location from where consumers order online as a barrier impeding the adoption of VFRs.

Contextual Constraint

Another situational barrier to adoption of VFRs is that interviewees perceive companies’ return processes as seamless and thus do not feel the need to adopt VFRs. Many interviewees stated that they usually order multiple sizes when unsure of the correct size. The reason for this behavior is referred to the fact that the return processes are often very convenient, making them reluctant to invest time in finding the right size pre-purchase.

This thesis identifies three factors contributing to this seamless return process. The first factor contributing to the seamless experience of companies' return processes, include the provision of free return options. In line with this, interviewee 1 emphasized: “I always check if returns are free, because if it is not I would never order multiple sizes of the same garment.” The second factor highlighted, contributing to the seamless return process, was the option to pay by invoice using Klarna, as this implies that you do not have to wait for your money to be refunded while the return is being processed. With regards to this interviewee 11 expressed: “I often buy multiple sizes of an item because it's convenient. With Klarna for example, I don't have to spend the money before I have received the items and know if it fits. If I had to pay immediately, I would probably be more concerned about finding the right size before making the purchase.” Lastly, the third factor mentioned, contributing to the seamless return process, was the inclusion of return labels in the order package. This was exemplified by interviewee 6 expressing: “Sometimes I find the return process a little too simple. When the return label is included in the package I find it specially convenient. Then it's just to fold up the package and hand it in again. I think that this convenience causes me to order more items, as well as returning more items.” These three factors contribute to interviewees experiencing companies’ return processes as seamless, hence acting as a barrier to adoption of VFRs.

Lack of Visibility

This thesis discovered lack of visibility as a situational barrier impeding the adoption of VFRs. Several interviewees expressed confusion about where they should click in order to access the VFR. Some interviewees expressed that they thought that the button to access the VFR referred to a traditional size chart, and thus did not click on it. In line with this, interviewee 11 expressed ” Not very good marketing for the tool’s existence, one could have

easily mistaken it for a regular size chart”. Further, several interviewees never managed to access the VFR and thus had to receive guidance from the interviewer. With regards to this, interviewee 4 expressed, “I found it difficult to locate. It would have been helpful if it said “Virtual Fitting Room Try On” or something similar”. This exemplifies that lack of visibility acts as a barrier for adoption of VFRs.

5. Discussion

This chapter is divided into two main sections based on the two two research questions. The first section, drivers for adoption of VFRs, is further divided into two categories: intrinsic and extrinsic motivation. The second section, barriers for adoption of VFRs, is divided into three categories: functional-, psychological, and situational barriers. In each section, the findings are discussed in relation to the theoretical framework employed in this thesis.

5.1 Drivers For Adoption of VFRs

As indicated above, this study suggests two drivers rooted in intrinsic motivation that encourage adoption of VFRs: *enjoyment* and *sustainability values*. Furthermore, as shown, the study suggests four drivers rooted in extrinsic motivation that encourage adoption of VFRs: *superior solution*, *ease of use*, *incentives* and *social influence*.

5.1.1 Intrinsic Motivation

The first driver, *enjoyment*, pertains to the perceived joy and pleasure derived from utilizing the tool. This driver is rooted in intrinsic motivation as it relates to the inherent satisfaction of using the tool, rather than a specific outcome. Hence, it aligns with the definition of intrinsic motivation suggested by Deci and Ryan (2020). This driver has previously been suggested as a factor driving adoption for VFRs (e.g Lee et al., 2022 ; Lee et al., 2019). Further, enjoyment has not only been proposed as an important factor driving adoption of VFRs, but rather for a variety of innovations (e.g., Davis et al. 1992; Trevino et al., 1992).

The second intrinsically motivated driver, *sustainability values*, refers to an individuals' motivation to use VFRs based on the positive feelings derived from the alignment with their sustainability values. Hence, it relates to Deci and Ryan's (2020) description of intrinsic motivation. As shown, this thesis indicates that sustainability values amongst consumers drive adoption of VFRs as the tool allows them to make decisions that align with their values and beliefs. In accordance with Deci and Ryan (2020), making choices that align with one's values and beliefs fosters a feeling of autonomy, which in turn drives intrinsic motivation. Hence, it can be argued that adopting VFRs can be driven by an intrinsic motivation to make decisions that align with an individual's sustainability values. This finding is not frequently

suggested in studies investigating adoption of VFRs, making it an interesting contribution of this thesis.

Altogether, as discussed, this thesis has identified two drivers rooted in intrinsic motivation: *enjoyment* and *sustainability values*. However, the findings indicate that the adoption of VFRs is not solely driven by intrinsic motivation, rather various factors rooted in extrinsic motivation also influence the adoption of VFRs.

5.1.2 Extrinsic Motivation

The first extrinsically motivated driver for adoption of VFRs identified, *superior solution*, refers to the perception of the tool as offering more benefits compared to currently existing tools. Hence, this driver relates to the extrinsic desire amongst consumers to attain an improved outcome by adopting VFRs, and therefore constitutes a driver rooted in extrinsic motivation (Deci & Ryan, 2020). Similar findings have commonly been conveyed in previous studies investigating technology adoption for a variety of domains (e.g., Kwon et al., 2000; Lule et al., 2012). Further, the finding aligns with Lee et al. 's (2022) finding of utilitarian benefits, which refers to the perceived consumer usefulness as a factor influencing adoption of VFRs.

The second extrinsically motivated driver towards adoption of VFRs identified, *ease of use*, relates to the perception of the tool as convenient and simple to use. Thus, this driver is motivated by the desire to attain a certain outcome in a convenient way, aligning with the definition of extrinsic motivation introduced by Deci and Ryan (2020). The finding is consistent with previous studies investigating VFRs, which indicate that perceived ease of use plays an important role for adoption of VFRs (Li & Xu, 2020; Lee et al., 2019). Further, this finding is not limited to the adoption of VFRs, rather it has been suggested as a driver for adoption of different technologies (e.g., Kwon et al., 2000; Lule et al., 2012).

The third extrinsically motivated driver found in this thesis was *incentives* provided by online retailers. The driver refers to the provision of incentives, such as discounts or free returns, to encourage consumer adoption of VFRs. Hence, the driver is extrinsically motivated by the consumer desire to attain an external reward (Davis et al., 1992). One possible explanation for the prominence of this driver could be the limited perceived need for the intervention

amongst consumers. The empirical findings in this thesis suggest that consumers found the current return process as seamless, leading to a low necessity for adopting VFRs. Consequently, it can be argued that the adoption of VFRs can be driven by the provision of incentives by online retailers.

The fourth extrinsically motivated driver identified in this thesis is *social influence*. The driver pertains to the reward of being perceived as innovative and up to date with technologies by others through adoption of VFRs. Hence, the driver is motivated by the desire to attain an external reward, as emphasized by Davis et al. (1992). In accordance with this result, social influence was identified as a driver by Huang and Qin (2011), investigating adoption of VFRs. Furthermore, the factor has been identified by Lu et al. (2019) investigating factors driving technology adoption.

Taken together, as discussed, this thesis has identified four drivers rooted in extrinsic motivation: *superior solution*, *ease of use*, *incentives* and *social influence*. This section has discussed drivers for adoption of VFRs. In the following section barriers hindering the adoption of VFRs will be discussed.

5.2 Barriers for Adoption of VFRs

As shown, this thesis has identified four functional barriers to adoption of VFRs: *lack of additional value*, *doubts of accuracy*, *time-consuming* and *established shopping habit*. In addition, four psychological barriers have been identified: *Negative preconceptions of size guides*, *lack of personalisation*, *body anxiety* and *privacy concern*. Lastly, three situational barriers impeding the adoption of VFRs have been identified: *location constraint*, *contextual constraint* and *lack of visibility*.

5.2.1 Functional Barriers

One of the functional barriers impeding adoption of VFRs is the perception of *lack of additional value* provided by the VFR. Our findings show that there was insufficient motivation to adopt VFRs since it did not offer any new features compared to the tools that are already available, such as size guides. This reasoning aligns with what Ram and Sheth (1989) describes as a value barrier.

Another functional barrier was *doubt of accuracy*. This barrier pertains to consumers' skepticism towards the potential of the VFR to provide a correct size recommendation. The findings uncovered several dimensions of accuracy doubts, with one of the most prevalent being the perception of the tool as being overly generic. This perception caused distrust amongst consumers for the tool's ability to generate a personalized and accurate size recommendation. This barrier is consistent with Lee et al., (2022), suggesting technical concerns as a factor hindering adoption of VFRs. Various factors could explain the accuracy doubt experienced by consumers. One potential explanation is that consumers find it challenging to grasp the underlying functionality of the VFR. This aligns with Ram and Sheth's (1989) reasoning that individuals tend to question the performance of an innovation when they face difficulties in comprehending its underlying functionality. This is further referred to as perceived complexity which relates to the difficulty in understanding the idea of the innovation (Cham et al., 2021). Further, it is fair to argue that another potential explanation for the perceived accuracy doubts can be the fact that VFRs is a novel phenomena. This novelty causes consumers to question the performance as they are not familiar with similar techniques.

Another functional barrier identified in this thesis was that consumers perceive it *time-consuming* to use VFRs. The findings revealed that the perception of using VFRs as a time-consuming task causes consumers to refrain from using the tool. It was shown that consumers value a quick and seamless shopping-experience, hence any additional steps that impedes this experience are met with resistance. Contrary to the results of this thesis, Lee et al., (2022) highlight that adoption of VFRs enables time savings. One potential explanation for the contrasting results could be that different VFRs have been used in the two studies. The VFR used in this thesis provided a size recommendation, as opposed to the VFR used in the study conducted by Lee et al., (2022) which allowed consumers to virtually try on garments. It is therefore reasonable to assume that the use of different types of VFRs may have affected the results. This indicates that whether consumers perceive VFRs as time-consuming or time-saving tools might vary with various types of VFRs.

Further, the findings indicate that an *established shopping habit* constitutes a functional barrier impeding adoption of VFRs. The results revealed that consumers' ingrained habit of trying out clothes in-store when they prioritize finding the correct size, inhibits the adoption of VFRs. This barrier to adoption of VFRs aligns with Ram and Sheth's (1989) description of

usage barriers. This type of barrier occurs when individuals encounter situations where the new innovations are in conflict with existing habits (Ram & Sheth, 1989). Hence, it is fair to argue that consumers tend to favor established practices over new ones, which contributes to the explanation of why customer-usage of VFRs has been low even in the cases when the tool has been implemented amongst retailers in Sweden, as emphasized by Gustafsson (2021). In addition, habit has previously been identified as a barrier impeding adoption for a variety of other innovations (e.g., Yien et al, 2016, Alalwan et al, 2015). Hence, established habit as a barrier for adoption is not unique for the adoption of VFRs.

Altogether, as discussed, this thesis has identified four functional barriers impeding adoption of VFRs: *lack of additional value*, *doubts of accuracy*, *time-consuming* and *established shopping habit*. However, the findings indicate that not only functional barriers impede the adoption of VFRs. Following, the psychological barriers indicated in this thesis will be discussed.

5.2.2 Psychological Barriers

As evidenced, the first psychological barrier identified was *negative preconceptions of size guides*. The findings revealed that negative experiences with various types of size guides caused distrust in the performance of VFRs. This reasoning aligns with Antioco and Kleijnen (2009) emphasizing that psychological barriers impeding adoption of technologies arise when conflicts arise with consumers' prior beliefs. Hence, it can be argued that negative experience with size guides have contributed to the belief that VFRs could not provide any better outcomes, ultimately impeding adoption of the tool.

The second psychological barrier identified in this thesis was *lack of personalisation*. It was revealed that the concern about the tool's failure to incorporate individual preferences constitutes a factor that hinder the adoption of the tool. Hence, in line Heidrenreich and Handrich (2015) definition of psychological barriers, the perceived attributes of VFRs caused psychological problems for consumers, ultimately contributing to the resistance towards adoption. This finding aligns with Gustafsson (2021) emphasizing the fact that determination of fit is subjective in nature, as a factor impeding adoption of VFRs.

The third psychological barrier identified in this thesis was *body anxiety*. The findings revealed that the experience of psychological distress when utilizing the tool hindered consumers from adopting the tool. Hence, the experience of negative emotions causes a psychological problem that hinders adoption, which aligns with Heidenreich and Handrich (2015) definition of psychological barriers. This psychological barrier is not commonly observed for other technical innovations, nor when investigating barriers for adoption of VFRs. The distinctiveness of the findings in this thesis can possibly be explained by the sample selection of women within the age range of 18-29 used in this thesis. It is fair to argue that this segment is more prone to physical discomfort and body image concerns, due to social pressures and norms. Hence, this finding may not be representative for a general population, but rather a strong barrier for young women.

The fourth psychological barrier identified in this thesis was *privacy concerns*. The findings revealed that insecurities regarding how the tool stores and manages personal body metrics act as a barrier impeding adoption of VFRs. Thus, in line with Heidenreich and Handrich (2015) it can be argued these privacy concerns caused a psychological conflict impeding adoption of VFRs. This finding is consistent with the results presented by Lee et al. (2022) stating that personal concerns impede adoption of VFRs. Additionally, this finding aligns with Cham et al. (2021), declaring that perceived privacy risk constitutes a barrier for adoption of mobile payments. Common for VFRs and mobile payments, is the requirement of sharing personal information. Hence, it is reasonable to assert that privacy risk is a significant concern for technologies that involve the omission of personal information.

However, psychological barriers are commonly divided into two categories: tradition barriers and image barriers (Ram & Sheth, 1989). Yet, in the context of VFRs, these categories appear to be of less importance. One possible reason for the minor significance of the image could be that the use of VFRs is primarily done in solitude. Hence, the use of VFRs does not jeopardize the image of the consumer. With this in consideration, it is fair to argue that the image barrier might hold greater influence over technologies that are noticeable by people in the surrounding, as opposed to VFRs. Furthermore, tradition barriers might be less prominent in the context of VFRs, due to the fast moving nature of e-commerce. Hence, consumers might not hold strong traditions toward a certain way of shopping.

Taken together, as discussed, this thesis has identified four psychological barriers impeding adoption of VFRs: *negative preconceptions of size guides*, *lack of personalisation*, *body anxiety* and *privacy concern*. In the following section the situational barriers revealed in this thesis is discussed.

5.2.3 Situational Barriers

In addition to the functional- and psychological barriers as introduced by Ram and Sheth (1989), this thesis has identified a third category impeding adoption of VFRs. This since some of the identified themes could not be categorized as either functional- or psychological barriers. Therefore a third category emerged. This category of barriers is rarely emphasized in previous research investigating technology adoption. However, support for this category was found in previous studies indicating that context specific factors such as facilitating conditions affect consumers' resistance to technology. Hence this thesis emphasizes the importance of not only functional- and psychological, but also situational barriers for adoption of VFRs.

The first situational barrier identified, *location constraint*, refers to the challenges to conduct a body scan in the specific location from which consumers commonly place their orders. The findings revealed that consumers often perform their online shopping when commuting from school or work and that it would be infeasible to set up a camera to conduct the scanning in this specific situation. Hence, this acknowledges that context specific factors affect the adoption, which aligns with the findings of Lu et al. (2019).

The second situational barrier identified in this study, *contextual constraint*, refers to the prevailing circumstances within e-commerce which contributes to the experience of a smooth and seamless return process. The provision of free returns, opportunity to pay by Klarna and the inclusion of return labels was emphasized as conditions contributing to a seamless return process. Altogether, these conditions contributed to lacking motivation amongst consumers to carry out a thorough evaluation when selecting the appropriate size. One can hence argue that these context specific circumstances impede adoption of VFRs.

The third situational barrier identified, *lack of visibility*, refers to the experienced difficulty in locating the VFR. It is fair to argue that this barrier is dependent on the specific website

providing the specific VFR used for this thesis, and hence does not constitute a barrier for all VFRs. The findings revealed that lack of visibility impedes the adoption of VFRs as consumers might not be aware of the tools' existence. This aligns with Lee et al. (2020), emphasizing technology visibility and consumer awareness as significant factors explaining consumers intention to use VFRs.

Altogether, as discussed, this thesis has identified three situational barriers impeding the adoption of VFRs: *location constraint*, *contextual constraint* and *lack of visibility*.

6. Conclusion

The following chapter presents the conclusion of the thesis and consists of five sections. The first section demonstrates the main findings of this study. Further, the second section presents the theoretical contributions of the thesis. Subsequently, the third section presents the practical implications of the thesis. In the fourth section the limitations of the thesis are discussed. Lastly, the chapter concludes by raising suggestions for future research.

6.1 Main Findings

The purpose of this study was to create an understanding into the barriers and drivers that influence the adoption or rejection of VFRs among consumers in the Swedish online fashion retail market. This thesis clearly indicates that various drivers foster adoption of VFRs. These drivers can be divided into two categories: intrinsic and extrinsic motivation. The thesis found two drivers rooted in intrinsic motivation: *enjoyment and sustainability values*. Further, the study found four drivers rooted in extrinsic motivation: *superior solution, ease of use, incentives and social influence*. Taken together, these drivers show that various factors encourage the adoption of VFRs.

Further, this study discovered various barriers impeding the adoption of VFRs. These barriers can be divided into three categories: Functional, psychological and situational. This thesis found four functional barriers to adoption of VFRs: *lack of additional value, doubts of accuracy, time-consuming and established shopping habit*. In addition, this study identified four psychological barriers: *Negative preconceptions of size guides, lack of personalisation, body anxiety and privacy concern*. Lastly, three situational barriers impeding the adoption of VFRs were found: *location constraint, contextual constraint and lack of visibility*. Altogether, these barriers show that numerous factors hinder the adoption of VFRs.

Altogether, this thesis indicates that even though drivers exist for the adoption of VFRs, the barriers identified appear to explain the low usage amongst consumers, as highlighted by Gustafsson (2021).

6.2 Theoretical Contribution

This study enhances the research field within technological adoption of VFRs through its theoretical contribution. First, this thesis contributes theoretically by identifying drivers and barriers specific for the adoption of VFRs. By employing a qualitative research design, this thesis was able to provide insights that had not previously been addressed by quantitative studies within the field (e.g., Li & Xu, 2020; Lee et al., 2020; Huang & Qin, 2011). For instance, the finding of body anxiety and location constraints has not previously been identified as barriers impeding adoption of VFRs. Likewise, sustainability values have not previously been identified as a driver for adoption of VFRs. Secondly, in comparison to previous quantitative studies, this thesis contributes by providing a deep understanding of the identified drivers and barriers influencing adoption of VFRs. Third, this study contributes theoretically by highlighting the importance of the situational aspects in adoption of VFRs.

Previously researchers have commonly referred to Ram & Sheth's (1989) established division of functional and psychological aspects, when investigating barriers to technology adoption. This study, however, contributes by suggesting a third category, situational barriers, in addition to the established divisions. The importance of situational aspects has not previously been mentioned in the field of VFRs, however Lu et al. (2019) emphasized that facilitating and contextual factors might influence the adoption of other technologies. Lastly, the barriers identified in this thesis contribute by providing an alternative explanation to why customer usage has been low even when implemented amongst online retailers in Sweden, as highlighted by Gustafsson (2021).

6.3 Practical Implications

In addition to the theoretical contributions, this thesis further holds practical implications. As previously mentioned, VFRs have potential to reduce the number of returns (e.g., Cullinane, 2019a; Gustafsson, 2021). However, given that customer usage of VFRs has been low (Gustafsson, 2021), the drivers and barriers discovered in this study can be used to develop VFRs tailored to consumer needs. The identified drivers and barriers provide companies with useful insights to overcome consumer resistance and enhance adoption. This in turn, has potential to result in a more sustainable consumer behavior by facilitating sustainable choices. By that means, the prevailing return culture, as emphasized by Cullinane (2019a) might be mitigated. Ultimately, this could reduce online retailers' return rates and hence the

negative environmental externalities caused by this behavior (Bring, n.d; Cullinane, 2019a; Frei, 2020). This in turn, contributes to achieving the Sustainable Development Goal 12 of responsible production and consumption (UN, 2023).

6.4 Limitations

The most prevalent limitation of the thesis is that VFRs is a novel phenomena which is not yet established in the Swedish market. Therefore, the knowledge and awareness of the intervention amongst interviewees were low and only a few had previously utilized the tool in a buying situation online. As a consequence, the interviewees' reasoning and perceptions of VFRs are hypothetical in nature. It is thus important to acknowledge that this might have impacted the reliability of the results in this thesis. However, this limitation was addressed by enabling interviewees to try out a VFR, allowing them to comprehend the overall idea of the concept.

This thesis was further limited by the sample selection. As the interviews were exclusively conducted with women within the age span of 18-29 it is relevant to consider that this might have impacted the results. However, it is fair to argue that the selection is motivated by the fact that women within the age range of 18-29 constitute the segment that causes the most online returns in Sweden (Postnord, 2022). Since this study focuses on VFRs in relation to online returns, investigating this particular segment is deemed relevant.

Additionally, the thesis is limited to investigating a specific type of VFR. However, it is important to acknowledge that various types of VFRs exist. Hence, it should be noted that conclusions about VFRs in general can not be drawn. Rather, the thesis exclusively provides insights regarding the chosen VFR.

Lastly, as previously mentioned, the researchers have been transparent about themselves when conducting interviews and have therefore provided the interviewees with information regarding the researchers field of education, namely Corporate Sustainability. This in turn might have affected the interviewees to portray themselves as more sustainability conscious than they truly are.

6.5 Future Research

As the results in this thesis is limited to the sample selection of women within the age span of 18-29. Therefore, additional research is needed to investigate other consumer segments, as there might be additional factors influencing adoption and rejection of VFRs amongst these consumers. Interesting segments to investigate include other age spans and genders. By doing so it is possible to obtain a richer field of drivers and barriers for adoption of VFRs.

Furthermore, as discussed, the findings are limited to investigating one specific type of VFR. Therefore, attention is called to future research investigating drivers and barriers for other types of VFRs, as there might be additional factors influencing adoption of these alternatives.

In addition, as this thesis has employed a consumer perspective to adoption of VFRs, further research is needed to examine the company perspective. Given that Gustafsson (2021) emphasizes that only a few retailers have implemented VFRs, it would be interesting to investigate what factors cause companies' resistance to VFRs.

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Appendix A: Interview Guide

Information

- Management of interview data
- Recording
- Transcription
- Ethical considerations

Demographics

- What is your name?
- How old are you?

Consumer Behavior

- General buying habits of clothes
 - Elaborate on how you normally shop for clothes
 - How often do you buy clothes?
 - Through what channels do you buy clothes?
- Online vs. offline:
 - When do you buy clothes in a physical store and when do you buy clothes online?
 - Are there differences between what you shop online vs. in store? If so, what are the differences?
- Online buying behavior
 - Describe the process of how you go about completing an online clothing order. (Describe a regular purchase or the most recent purchase).
 - How often do you buy clothes online?
 - At what point in time and at what location do you typically find yourself when placing clothing orders online?
 - How much time would you estimate that an average online order of clothes takes for you?
 - Elaborate on the time aspect of buying clothes online.
 - Do you perceive it riskful to purchase clothes online?
 - If so, why?
 - What factors contribute to you experiencing it riskful?

Personality traits and Sustainability

- Do you consider yourself sustainability conscious? Elaborate on this
- Do you consider sustainability aspects when buying clothes online? If so, how?

- In terms of online returns, how do you approach sustainability aspects?
- Do you like using new technology?

Virtual Fitting Room

- Have you ever heard of Virtual Fitting Rooms?
 - If yes, how?
- Have you ever used a Virtual Fitting Room?
 - If not, do you know approximately how it works?
- *Visual Elicitation:* Let the interviewee try the Virtual Fitting Room.
 - Observe and document how it goes

First impression:

- How did you experience the Virtual Fitting Room?
- Have you used any similar tools before?
 - If yes, how does this tool differ from the tools you have previously tried?

Drivers:

- What benefits do you think you could obtain from utilizing the tool?
 - Do you think that the Virtual Fitting Room could save you time?
 - Do you think that the Virtual Fitting Room could help you find the correct size?
 - Would you find enjoyment from utilizing the tool in a buying situation?

Barriers:

- What obstacles do you perceive when it comes to using the Virtual Fitting Room?
- What disadvantages/challenges do you perceive when it comes to using Virtual Fitting Rooms?
 - How would you consider the user-friendliness of the Virtual Fitting Room?
 - Do you find any concerns with the use of body scanning? Elaborate on this
 - Would you trust the size recommendation provided by the Virtual Fitting Room? Why/ Why not?

- Do you think that the use of Virtual Fitting Rooms would affect how others perceive you?
- Would it feel burdensome/inconvenient for you to switch from the current approach of finding the correct size?
- Do you think that it would take time for you to learn how to use a Virtual Fitting Room?

Intention to use:

- Are Virtual Fitting Rooms something you would consider when buying clothes online in the future?
 - If yes/no, how come?
 - If not, what would convince you to start using the tool?

Concluding questions:

- Is there anything else concerning online purchases, returns and Virtual Fitting Rooms that we have not asked you about but you think we should know?
- Can you provide us with a recommendation of a person who would be suitable for interviewing?
 - Criteria: Woman, Age 18-29 & shop fashion online