Augmented Reality -
How it influences customer experience

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Abstract

Augmented reality (AR) has emerged as a new interactive technology that enables marketers to craft an immersive experience for customers. The technology complaints the physical environment with virtual objects, and thus have the unique power to put the (virtual) product in the hands of the consumer. This provides marketers with a new option for reaching out and engaging with customers. Although the AR market is estimated to grow exponentially by the year 2023, little is known about how AR-applications on smart devices influence customer experience. This thesis addresses the research gap by exploring how IKEA Place, an AR-application, influences customer experience. By using a conceptual framework of online customer experience we explore how different antecedents influence the experience with AR. Furthermore, the study also highlight the differences between a website and an AR-application, and thus give a more nuanced understanding about AR. As the majority of the research on AR-technology has a quantitative approach, this study was done through a qualitative study using a quasi-experimental design. The empirical result indicates that aesthetics, ease-of-use, telepresence and assortment influence customer experience extensively. Moreover, the result also suggests that hedonic value influences the augmented experience more than the utilitarian, and thus customers do not perceive the application to fulfil their utility needs.

Keywords: Augmented reality, customer experience, interactive technology, cognitive experiential state, affective experiential state, hedonic value, utility value, IKEA
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1. Introduction

1.1 Background

In today’s society we are surrounded by technology and the continuous development of new inventions. One of the most useful innovations during the last decades is probably the Internet. It provides us with tremendous search capabilities, and the ability to expand and build new online platforms (Hoffman and Novak, 1996). Other significant innovations are wireless devices, virtual reality displays, and robotics (Burke, 2002). The growth of new technologies is important; both internally and externally as it helps companies to simplify their operations and further to enhance the consumer experience and facilitate consumer adoption (Burke, 2002; Meuter, Ostrom, Bitner and Roundtree, 2003). The new media of Internet has changed aspects in everyday life, where a shift has moved from conventional buying in stores to retail e-commerce (Dittmar, Long and Meek, 2004).

Many customers still prefer physical stores when shopping (Grieder and Buck, 2014). However, the mobile disruption is not something companies can ignore, especially since e-commerce is booming. Hence they have to build a stable bridge between the digital and the real world in order to meet consumers technology-driven needs (Conick, 2017). Companies face great challenge from this new digital transformation journey, since the digital-customer experience are more complex and difficult to understand. Nevertheless, the awareness of how to build effective digital channels have increased, and in many industries this is a necessity (Yen and Lu, 2008; Asif, Hiraoka, Jones and Vohra, 2017). With such digital practices, companies have the possibility to create long-term value and a better experience for their customers, which secure the business in the future (Gandhi, Gordon, Perrey and Serra, 2017; Conick, 2017).

Improving customer experience and adapting to changing consumer behaviour are vital in today’s market. Customer experience encompasses everything in a company’s offering, such as customer care, product and service features, and reliability (Gentile, Spiller and Noci, 2007). Meyer and Schwager (2007) argue that too much time has been spent on analysing what companies think customer wants, instead of focusing on customer expectations and experiences. Companies that successfully use digital service and operations have a
competitive advantage in terms of creating increased customer experience (Bughin, LaBerge and Mellbye, 2017; Fanderl, Neher and Pulido, 2017). According to Pine and Gilmore (2011) companies that create a distinctive customer experience have the possibility to provide enormous economic value. Furthermore, Gentile, Spiller and Noci (2007) argue that it is important to have a strong customer focus in order to stay competitive. In the past, marketers predominantly argued that customers purchase decisions were based on rational motives. This view has evolved the last decades to become more logic where emotions play a larger role and where it is less focus on rational choices in decision making (Holbrook and Hirschman, 1982). This new experiential view has evolved from only being economic value for the company to a perspective that creates value for both the customer and the company (Addis and Holbrook, 2001; Prahalad and Ramaswamy, 2004).

As consumer behaviour change, companies are forced to digitalize processes to capture value and improve customer experience (Asif, Hiraoka, Jones and Vohra, 2017). Gentile, Spiller and Noci (2007) explain how companies should make use of new marketing tools to support excellent customer experience. Today, technology has given markets a huge opportunity to actually interact on a new level with consumers (Javornik, 2016a). Augmented reality marketing (ARM) is one tool that is predicted to become popular in marketing, especially since it is a mobile device solution (Yaoyuneyong et al., 2016). ARM originates from the technology augmented reality (AR), which allows computer generated virtual imagery to overlay physical objects in the real environment (Zhou et al., 2008). Unlike virtual reality (VR), where the user is totally immersed in a virtual environment (see figure 1), AR allows the user to combine real and virtual objects in real time (Azuma et al., 2001). Together, all these environments are called mixed reality (MR). AR-technology has “the power to put the product in the hand of the users” (Wood, 2009, p. 37), thus making it possible for customers to interact with the product (Al-Modwahi, Parhizkar and Lashkari, 2012).

![Diagram](image)

Figure 1. Milgram and Kishino’s (1994) simplified representation of a “virtuality continuum”
1.2 Problem statement

As new marketing tools have been developed, it has been a sharp increase in the amount of marketing research in the area (Singh, Jackson and Collinane, 2008; Trihas et al., 2013; Brown, Boon and Pitt, 2017). However, the majority of the research focuses on established marketing tools, such as social media and online communities (Agarwal and Karahanna, 2000; Kozinets et al., 2010). Therefore, there is limited knowledge within the field of the efficiency of new tools, such as ARM. The implication of this is that marketers have to choose strategies based on instinct rather than facts (Yaoyuneyong et al., 2016). Markets and Markets (2017) estimate that the AR-industry will grow $61.39 billion by 2023, and according to Digi-Capital (cf. Forbes, 2017) AR-revenues will reach $120 billion by 2020 (Welch, 2017). AR has the potential to alter a large number of consumer activities since it has the ability to deliver virtual content to them. Whereas the use of AR increases in marketing, there is a growing need to better understand its impact on consumer behaviour (Javornik, 2016a). Hence, it is vital that more research is conducted in the area.

In line with the increase of AR, the technology has been piquing marketers’ interest (Javornik, 2016b; Scholz and Smith, 2016). Hence, several ARM tools have been developed over the years (e.g. JC Penney, LazyLazy and Tobi Fashion) (Kang, 2014). However, the majority of these tools are no longer available on the market. This could be due to the low delivery of customer experience, or poor business performance (Accenture, 2014). According to Javornik (2016b) companies tend to hastily develop ARM tools, and ignore to focus on how customer will interact with this particular technology. As AR differs from other interactive technologies (e.g. websites), marketers cannot expect AR to have the same effect on customers. Previous research within AR discuss its impact on consumer behaviour (Squire and Klopfer, 2007; Kim and Forsythe, 2008; Huang and Liu, 2014). However, these studies largely investigate computer-human interaction within AR, and not as much on smart devices. As companies today are more keen to develop AR-applications for smart devices (Javornik, 2016a), it is of importance to shed more light on this area. Furthermore, the majority of the research that has been conducted on AR use quantitative approaches (Kim and Forsythe, 2008; Anderson et al., 2013), and thus there is a lack of qualitative research within the area. A qualitative research has the possibility to extend marketers’ understanding of how
AR-applications influences the customer experience, as it allows a deeper mining into customers’ mind (Wright and Crimp, 2000).

As mentioned above, AR-technology has the ability to enhance a meaningful and new customer experience, which in turn affect the purchase intention of a product (Chang and Wang, 2008; Rose et al., 2012; van Noort, Voorveld, and van Reijmersdal, 2012). According to previous research, customer experience is based on two psychological constructs: cognition (think) and affect (feel) (Rose et al., 2012; van Noort, Voorveld, and van Reijmersdal, 2012; Chang and Wang, 2008). However, the majority of the research on interactive technology argue that it foremost leads to affective responses (Rose et al., 2012; Chang and Wang, 2008), and not to cognitive responses for which limited research is reported to be a positive effect (van Noort, Voorveld, and van Reijmersdal, 2012; Cyr et al., 2009). As stated above, AR has different features than other interactive technology, and thus it would be interesting to see if AR affect customers in the same way as other technologies, or if it influences the customer experience differently.

1.3 Purpose
The purpose of the research is to explore how an AR-application influences customer experience. A conceptual framework of online customer experience will help to analyse this research area and subsequently engender propositions, which set up the stage for further research. Furthermore, we shed a light on the connection between websites and AR-applications, and the difference between the two platforms. This will give a nuanced understanding about AR’s affect on customer experience.

Since there are few AR-applications on the market available for customers, we have chosen the furniture company IKEA’s new application “IKEA Place”. The application was launched 26th of September 2017 in Sweden (Strandberg, 2017), and is therefore relatively new on the market. IKEA’s website is therefore the chosen website for the study. By focusing on the furniture industry we also have an opportunity to study a new industry within the area. Within the stated purpose, the following research question will be addressed in the thesis:

How does an augmented reality application influence customer experience?
1.4 Thesis Disposition
This thesis is structured into five sections: literature review, method discussion, empirical findings and analysis, discussion and conclusion. The literature review is presented to create an understanding within customer experience and AR-technology. After this, the method of the thesis is described with the intention to explain how the empirical material was conducted and the researchers reasoning around it. Chapter four presents the empirical findings of the conducted interviews, and analysis the findings with help of the literature review. In chapter five, we discuss our findings, and present our propositions for further research. In the final part of the thesis, the concluding remarks are presented where we sum up our findings. This chapter also presents contributions, practical implications and further research.

1.5 Definitions
This thesis presents different concepts within the technology area, and in order to get less confused, a table of definitions is presented below. In this table, important concepts that are mentioned throughout the thesis are defined.

<table>
<thead>
<tr>
<th>Concept</th>
<th>Definition</th>
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<tr>
<td>Augmented Reality (AR)</td>
<td>Augmented reality is a technology, which allows virtual imagery to overlay physical objects in a real environment. AR-technology allows the user to interact with a virtual image using real objects in a seamless way (Zhou et al., 2008).</td>
</tr>
<tr>
<td>Virtual Reality (VR)</td>
<td>Virtual reality is a computer-generated scenario where the user is totally immersed in a virtual environment. This world may mimic the properties of the real world, either existing or fictional, or it can exceed the bounds of physical reality by creating a world in which the physical laws no longer hold (Milgram and Kishino, 1994).</td>
</tr>
<tr>
<td>Interactive Technology</td>
<td>Interactive technology refers to a two-way flow of information through an interface between a user and a technology (Varadarajan et al., 2010).</td>
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Table 1. Definitions of concepts that will be used throughout the thesis.
2. Literature review

2.1 The Concept of Customer Experience

The concept of experience entered the field of marketing and consumption with Holbrook and Hirschman’s article of 1982 (Carú and Cova, 2003). More than three decades later, the concept has become one of the key elements in understanding consumer behaviour (Addis and Holbrook, 2001), our economy (Pine and Gilmore, 2011; Gupta and Vajic, 2000), and the field of marketing (Schmitt, 1999; LaSalle and Britton, 2002). By delivering a unique experience to customers, companies have the potential to enhance the value of their product or service (Schmitt, 1999; Gentile, Spiller and Noci, 2007). Thus, contributors within the subject have flourished (Novak, Hoffman and Yung, 2000; Addis and Holbrook, 2001; Berry and Carbone, 2002; Carú and Cova, 2003; Gentile, Spiller and Noci, 2007; Meyer and Schwager, 2007; Verhoef et al., 2009; Rose et al., 2012).

Along with these contributors, numbers of definitions of the concept customer experience have followed (see table 1). According to Carú and Cova (2003) there is no unitary definition of customer experience. Researchers within the field of consumer behaviour perceive experience as something personal and emotional that is founded by the interaction with stimuli, such as a product or a service (Holbrook and Hirschman, 1982; Addis and Holbrook, 2001). In marketing (Schmitt, 1999; LaSalle and Britton, 2003), and economy (Pine and Gilmore, 2011; Gupta and Vajic, 2000), an experience is mainly a fourth type of offering that is added to commodities, products or services. Berry, Carbone and Haeckel (2002) state that companies are responsible for the experience, therefore they should orchestrate all the “clues” that customers detect when interacting with the company, in order to provide a satisfactory experience. This originates from the same definition that customer experience comes from, an interaction with a company (LaSalle and Britton, 2002; Gentile, Spiller and Noci, 2007). In line with this, Meyer and Schwager (2007) define customer experience as “[...] the internal and subjective response that customers have to any direct or indirect contact with the company” (p. 118). Direct contact occurs during the buying process, and is usually initiated by the customer. The indirect contact involves unplanned encounters with representatives of a company’s products or services, such as word-of-mouth, criticism, advertising, and so forth (Meyer and Schwager, 2007).
Another common topic within customer experience is what value a company can bring to its users, and what specific characteristics customers search for in their purchase (Childers, Carr, Peck and Carson, 2001). As mentioned above, the customer experience originated from a set of interactions between a customer and a company, and the value that the customer gains from the interaction (Addis and Holbrook, 2001). Following this definition, there is a distinction between two kinds of consumer value: utilitarian value (functional value) and hedonic value (experiential value). According to Gentile, Spiller and Noci (2007) products can be classified into three groups: hedonic products, utilitarian products, and balanced products where there is a balance between the two values. In line with this, Holbrook and Hirschman (1982) argue that customers are either ‘problem solvers’ and thus only seek utilitarian products, or fun and enjoyment seeker that mainly focus on hedonic products. These two values, utility and hedonic, will not be presented in our conceptual model, however it will be taken into consideration throughout our research because they are central components in customer experience.

<table>
<thead>
<tr>
<th>Author/Authors</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Holbrook and Hirschman (1982)</td>
<td>Customer experience is a personal occurrence, where emotions often plays a vital role which are founded by the interaction with a product or service consumed.</td>
</tr>
<tr>
<td>Schmitt (1999)</td>
<td>Customer experience occurs as a result of interacting, undergoing, or living through things. Experience further provides emotional, sensory, cognitive, behavioural, and relational values that in return replace functional values.</td>
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<tr>
<td>Pine and Gilmore (2011)</td>
<td>Customer experience is the fourth economic offering after commodities, goods, and services - the progression of economic value. Experience occurs “[...] when a company intentionally uses services as the stage, and goods as props, to engage individual customers in a way that creates a memorable event” (p. 98).</td>
</tr>
<tr>
<td>Gentile, Spiller and Noci (2007)</td>
<td>Customer experience originates from the interaction between a customer and a product, a company, or part of its organization, which in turn provoke a reaction.</td>
</tr>
<tr>
<td>Meyer and Schwager (2007)</td>
<td>Customer experience is the internal and subjective responses that customer have to a direct or indirect contact with a company.</td>
</tr>
<tr>
<td>Verhoef et al. (2009)</td>
<td>Customer experience is holistic in nature and include the customer’s cognitive, affective, emotional, social, and physical responses to a company.</td>
</tr>
<tr>
<td>Berry, Carbone and Haeckel (2002)</td>
<td>Customer experience originates from a set of “clues” that are sent to the customer. These clues are divided into two categories of experience: the actual functionality of the good or service, and the emotions, which include smell, sight, sound, taste, and texture.</td>
</tr>
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</table>

Table 2. Definitions of customer experience
Building on these definitions in table 2, we submit that customer experience is a psychological construct, that is holistic in nature, and include the customer’s subjective response to direct and indirect contact with a company (Carú and Cova, 2003; Gentile, Spiller and Noci, 2007; Meyer and Schwager, 2009; Verhoef et al., 2009). Consistent with Gentile, Spiller and Noci (2007) we posit that customer experience is based on two psychological constructs: cognition (think) and affect (feel). These two constructs have been identified as influential components of both customer experience and consumer behaviour (Bagozzi, Gopinath and Nyer, 1999; Schmitt, 1999; Novak, Hoffman and Yung, 2000; Frow and Payne, 2007; Verhoef et al., 2009; Rose et al., 2012; van Noort, Voorveld, and van Reijmersdal, 2012).

Moreover, the cognitive state and affective state have frequently been investigated in the field of interactive technology and customer experience (Novak, Hoffman and Yung, 2000; Chang and Wang, 2008; Rose et al., 2012; van Noort, Voorveld, and van Reijmersdal, 2012). Researchers within the area confirm that interactivity leads to affective responses (van Noort, Voorveld, and van Reijmersdal, 2012; Huang, 2012; Chang and Wang, 2008), however there is less evidence that show more cognitive responses. These previous studies on interactivity focus on computer-human interactivity, and not AR-technology on smart devices. Hence, there is limited research that shows how AR-applications influence the cognitive and the affective state of customer experience.

2.2 Augmented Reality and Customer Experience

Interactive technology is defined as a two-way flow of information through an interface between a user and a technology (Varadarajan et al., 2010). According to Javornik (2016a), interactive technology is an umbrella term for different forms of computer-mediated and digital environments. One of the most representative media characteristics of interactive technology is interactivity. The term interactivity has been extensively investigated; nevertheless, there is not a unitary definition of it (van Noort, Voorveld, and van Reijmersdal, 2012; Javornik, 2016a). It is however, often referred to as “[...] the degree to which two or more communication parties can act on each other, in the communication medium, and on the messages and the degree to which such influences are synchronised” (Liu and Shrum, 2002).
Augmented reality (AR) is perceived as an interactive technology (Javornik, 2016a). Current AR-applications are by definition interactive; however, they offer more features in terms of machine interactivity (i.e. allowing the user to access different content), than in terms of allowing communication with other people (Javornik, 2016a). In marketing theory, interactivity describes functional traits of technologies which allow objective, error-free measurements (Hoffman and Novak, 1996; Lister et al., 2008), and therefore it offers strong conceptual tools that can help to understand customer responses to their experience with technology (Sundar, 2009; Pagani and Mirabello, 2011).

One of the most confirmed effects of interactivity is flow (Chang and Wang, 2008; Hoffman and Novak, 2009; van Noort, Voorveld, van Reijmersdal, 2012), which refers to the immersion of a consumer to a highly absorbing state during an engagement with an interactive technology (Csikszentmihalyi, 1997). Flow within interactive technology has been defined as “a cognitive state experienced during online navigation” (Novak, Hoffman and Yung 2000, p. 24), and has proven to have a positive effect on the online customer experience (Rose et al., 2012; Novak, Hoffman and Yung, 2000). Hoffman and Novak (1996) confirm in their study that flow leads to positive marketing-relevant outcomes, such as increased learning, perceived behavioural control, exploratory mind-set, and positive subjective experience. Furthermore, studies has also shown that the cognitive experiential state (CES) has a positive effect on the online purchase intention (Rose et al., 2012).

Another important variable within interactive technology and customer experience is the affective experiential state (AES) (Rose et al., 2012; van Noort, Voorveld, van Reijmersdal, 2012). Gentile, Spiller and Noci (2007) explain how authors have included the affective state to give a better understanding for how emotions, moods, and feelings affect the customer experience. They further stress how companies have the ability to influence the affective system by for instance generating emotional experience, which can create a hedonic (experiential) value. According to Bagozzi, Gopinath and Nyer (1999) the affective system is affected by mental processes such as emotions, moods and even attitudes. Verhoef et al. (2009) and Schmitt (1999) mention that the affective system extend the understanding of
customer experience and how this together with the cognitive system give a more holistic view of included parts.

Previous research on virtual reality has discovered that enjoyment and hedonic value have a strong impact on consumer behaviour, while the utilitarian do not have the same impact (Kim and Forsythe, 2008; Chan and Li, 2010; Huang and Hsu Liu, 2014). Furthermore, studies also show that virtual reality is more related to affective commitment than cognitive commitment (Huang, 2012), which is also the case for customers that interact with websites (van Noort, Voorveld, and van Reijmersdal, 2012). Kim and Forsythe’s (2008) study on AR-technology further shows that users do not trust the accuracy of measurements when trying virtual clothes. Hence, trusting an AR-technology in terms of accuracy, such as measurements and colours can be crucial factors for creating an optimal customer experience. Furthermore, Javornik (2016a) calls for more research within this area in order to see if affective commitment and hedonic value are of a higher relevance than the cognitive commitment and the pursuit for utilitarian values.

In summary, we assume that customers engage in cognitive and affective processing of incoming sensory information from the augmented reality application. These two psychological states of the customer have a number of antecedent conditions that influence them. Furthermore, previous researches have shown that customer experience within an interactive technology leads to purchase intention of a product (Chang and Wang, 2008; Rose et al., 2012; van Noort, Voorveld, and van Reijmersdal, 2012), and is thus a desirable outcome of customer experience.

2.3 The Cognitive Experiential State (CES)

According to Novak, Hoffman and Yung (2000) the cognitive experiential state (CES) centres on the construct of flow. They demonstrate that this state is determined by 1) high levels of skill and control; 2) high levels of challenge and arousal; and 3) focused attention; and 4) is enhanced by telepresence. Csikszentmihalyi (1997) has further characterised this state as an ‘optimal experience’. Skadberg and Kimmel (2004) demonstrate in their survey, that website users who have a flow tend to learn more about the content presented on the website. A similar study, done by Choi, Kim and Kim (2007), show that within a training
context, the experience of flow plays a critical role in e-learning. In sum, a cognitive response is a positive effect of flow, and therefore a crucial factor in order to reach full experience when using an interactive technology. Due to the importance of flow in interactive technology and customer experience, we have chosen to include the concept when exploring customer experience with AR. As mentioned above, flow is influenced by several factors (Csikszentmihalyi, 1997). Novak, Hoffman and Yung (2000) state that skill, challenge, and telepresence are three direct influencers of flow, and in turn affect CES. These concepts will be further explored later in the literature review. Although, flow has been widely researched within computer-human interaction, it has not been widely discussed in virtual environments, such as VR and AR. Hence, Hoffman and Novak (2009) call for more research within the area of flow, customer experience and virtual worlds. According to them, virtual worlds present a rich environment for the study of flow.

Novak, Hoffman and Yung (2000) identify four direct antecedents of optimum online flow state: skill, challenge, telepresence and speed of interactivity. Although these concepts mostly have been tested on computer-human interactivity, we believe that it is important components in order to reach high customer experience when using an AR-application. In Rose et al.’s (2012) study on online shopping experience, they mention that skill and interactive speed do not influence CES. Their explanation of this is that Novak, Hoffman, and Yung (2000) original work was done more than two decades ago. Thus, the skill level of online shoppers has increased, and the interactive speed on websites is not a common problem today. Although, their result should be taken in consideration, we still argue that skill is an important factor for AR-technology due to the newness of the AR-applications. However, we will exclude interactive speed because today’s interactive speed is consistently superior, and therefore we believe that it is no obstacle for customers. In the following sections, all the antecedents of CES will be presented.

2.3.1 Skill and Challenge
Challenge and skill first appeared in Csikszentmihalyi’s (1997) model of flow. According to him, flow occurs when both skill and challenge are high. Thus, if these two concepts are not obtained, flow will not occur (Novak, Hoffman and Yung, 2000), and nor will the cognitive experiential state (CES). Skill refers to the online customer’s capacity for action during
navigation on the Internet (Ajzen, 1985). Control, the outcome of skill, comes from the user’s perception of one’s ability to successfully navigate through the online environment (Novak, Hoffman and Yung, 2000). Challenges online refer to the users opportunity to find action on the Internet (Ibid). Novak, Hoffman and Yung (2000) state that skill leads to control, which in turn leads to flow. However, as mentioned above, skill also directly influences flow. Earlier research within the concept of flow identifies four combinations of challenge and skill: 1) anxiety (high challenge/low skill); 2) flow (high challenge/high skill); 3) boredom (low challenge/high skill); and 4) apathy (low challenge/low skill) (Ellis, Voelkl and Morris 1994; Novak, Hoffman, and Yung, 2000). According to Ellis et al. (1994) customers will become bored and anxious if the website does not offer challenges congruent with their own skills.

2.3.2 Telepresence

Telepresence is frequently discussed within the concept of flow. Steuer (1992) defines telepresence as “[...] the experience of presence in an environment by means of communication medium” (p. 6). Mollen and Wilson (2010) further define telepresence as “[...] the psychological state of ‘being there’ in a computer-mediated environment, augmented by focused attention. It is characterised by cognitive and sensory arousal, control and immersion” (p. 921). This definition has frequently been used (Javornik, 2016a; Rose et al., 2012), and thus we will follow it in this study. Fiore et al. (2005) demonstrate that telepresence serves as an intermediate variable between website properties, virtual reality, and 3D product advertising on the one hand, and consumer behaviours and attitudes on the other. Thus, telepresence leads to customers feeling more informed about a product, and therefore have a more positive feeling towards it. They also state that telepresence is an immersive response where consumers perceive the artificial environment to provide the cognitive and sensory input comparable to that of the more concrete real environment.

2.4 The Affective Experiential State (AES)

Flavián-Blanco, Gurrea-Sarasa and Orús-Sanclemente (2011) demonstrate in their study on online behaviour that affective components play an important part in online search behaviour. They further argue that given the outcomes from their study, it is likely that emotional outcomes influence all the subsequent actions that users perform on the web. Previous
research has also shown that an affective experience online influenced the customer purchase intention (Rose et al., 2012; van Noort, Voorveld, and van Reijmersdal, 2012). There are multiple components that affect AES (Rose et al., 2012). In traditional retail context, aesthetic cues such as store layout, lighting, music, and colour scheme affect shoppers’ responses and decisions (Baker, Levy, and Grewal, 1992; Rose et al., 2012). Website aesthetics provide sensory stimuli (Eroglu, Machleit, and Davis, 2003), which results in a number of responses such as purchase, enjoyment, and satisfaction (McKinney, 2004). Therefore, it could be argued that aesthetics influence AES with an interactive technology. Another component that have been widely discussed within interactive technology and customer experience is ease-of-use (Verhoef et al. 2009; Rose et al., 2012; Noort, Voorveld and van Reijmersdal, 2012). According to Rose et al., (2012) ease-of-use include navigation and functionality of the website, and is therefore an important component as a greater ease-of-use lead to a greater perceived control, and affective experience with a website.

Moreover, a component that is important in retail environments, as well as in online environments, is service excellence (Verhoef et al., 2009). This is a component that also has proven to influence the affective state of a consumer (Verhoef et al., 2009; Bulearca and Tamarjan, 2010), and is therefore an interesting component to study within AR-technology. Two components that also affect service are ease-of-information access, and customisation (McKinney, 2004; Rose et al., 2012; Yaoyuneyong et al., 2016). The final and last, component that has proved to influence AES online is connectivity, which is the ability to connect and share knowledge with other users in the virtual community (Rose et al., 2012). In the following section the antecedents of AES will be presented.

### 2.4.1 Aesthetics and Ease-of-Use

Eroglu, Machleit and Davis (2003) state that aesthetics have a meaning not only in traditional stores but also online. They continue to explain that layout, colours and design can reflect what the retailers offer in terms of quality, target audience and how they want to influence the shopper during the online store visit. Even Pine and Gilmore (2011) identify aesthetics as one realm which influences customer experience. According to Rose et al. (2012) companies put a lot of effort on the visual design and the technological functions, however customers see these efforts as less important when shopping online.
According to van Noort, Voorveld and Reijmersdal (2012) affective responses can be enhanced when it is easier for customers to use the website. They further explain how the behavioural responses can increase by revisits on the website. Rose et al. (2012) also point out the importance of the ‘ease-of-use’, which according to them is an antecedent of AES. They further mention how complex navigation can be one factor that results in customers tendency to not return for another purchase. When investigating how customer experience is affected by the ease-of-use, it is of importance to investigate how errors and technology failures affect them (Verhoef et al., 2009). Research shows that failures and irritations have negative impacts on customers ability to process and proceed on the website (Ducoffe 1996; Tsang, Ho, and Liang, 2004). Rose et al. (2012) mention that ease-of-use is one of the most important features even though technology advances make customers feel more empowered and secure. The AR-technology is described as a technology that is easy to access and thus said to be easy to use, since it is connected to users smart devices, which can be carried around (Javornik, 2016a).

2.4.2 Ease-of-Information Access, Customisation and Service Excellence

Verhoef et al. (2009) state that there has been limited research on how new technologies influence customer experience from a service excellence perspective. They further mention that the service level affect the customer experience dependent of the technology involvement degree, either if the customer has to be passive or active in the usage. Huang and Liao (2014) explain, that when the service quality of an online experience through AR-technology is the same as a physical in-store experience, online customers will perform evaluations to enhance the quality of services and products online. The service offered through AR-applications do not replicate services offered by physical stores, but there is an uncertainty how much AR services differ from in-store services (Bulearca and Tamarjan, 2010). Customisation is suggested to influence feelings, which is one component that influences the customer experience and also gives the customer the opportunity to adapt purchases to their demands (Rose et al., 2012). The possibility to customise gives customers the opportunity to become more satisfied due to better experience (McKinney, 2004; Rose et al., 2012). How companies mediate information and how easy the information is to access is seen as an antecedent which affect the effectiveness of ease-of-information access (Yaoyuneyong et al., 2016). An
overload, limited or wrong information though, has negative impacts on customers’ feelings, which can result in no repeat purchase (Rose et al., 2016). According to Javornik (2016a) customers are more willing to search for information when the website provide accessible search functions.

2.4.3 Connectivity

Connectivity is identified as an important antecedent, which can influence the customer experience in a positive way (Verhoef et al., 2009). Customers can interact online with each other by giving advices and thus be potential influencers (Hagel and Armstrong 1998; Kozinets 1999; Hanna et al., 2011; Pescher et al., 2014). Rose et al. (2012) also mention connectivity as a factor that influences feelings of customers which further gives them confidence in online purchase decisions, and according to Calder et al. (2009) this enhance the probability that customers make a purchase immediately. Smart devices give the opportunity to interact easily due to the portability and wirelessness (Shankar and Balasubramanian, 2009; Varadarajan et al., 2010). However, Javornik (2016a) mentions that AR-applications have features for connectivity but does not yet allow connectedness with the same amount of parties.

2.5 Purchase Intention (PI) - An Outcome of Customer Experience

A proven outcome of customer experience within interactive technology is purchase intention (PI) (Chang and Wang, 2008; Rose et al., 2012; van Noort, Voorveld, and van Reijmersdal, 2012). Flow, which is a crucial component in CES, has further proven to influences the attitude towards online PI (Chang and Wang, 2008; van Noort, Voorveld, van Reijmersdal, 2012; Rose et al., 2012).

Previous research further show that direct product experience leads to a more positive attitude than an indirect product experience (Smith and Swinyard, 1983). AR-technology has the ability to show virtual products in a real environment (Zhou et al., 2008), and can thus be compared to a direct contact. Moreover, Huang and Liao (2015) state that visual appeal and hedonic value of AR foster the sustainable usage of the application. The visual attractiveness influences the rational purchase decision of customers (Geissler and Zinkhan, 1998). However, it also exists contradictory studies that questions if PI is affected by interactivity
3. Virtual Product Experience (AR)

Schwartz (2011) further shows that virtual product experience of AR can influence the attitude and PI negatively because the customer does not prefer the virtual objects. Bulearca and Tamarjan (2010) also find that the majority of their respondents value the timesaving and the convenience of an online AR-application. However, some users were uncertain if AR could be a substitute to their traditional purchase process due to the absence of sensory elements, such as touching the product. Although studies show different results, there is still lack of research within customer experience and AR-applications, and its affect on PI.

2.6 The Conceptual Model of Augmented Reality Customer Experience (ARCE)

To summarise the literature review, we present a conceptual model of augmented reality customer experience (ARCE). The model contains the presented antecedents, and the outcome of the cognitive experiential state (CES) and the affective experiential state (AES). As previously mentioned, the components in the model have been identified and proposed to directly and indirectly affect the cognitive and affective experiential state. Skill, challenge, and telepresence are proposed to directly affect CES (Novak, Hoffman and Yung, 2000). Furthermore, aesthetics, ease-of-use, service excellence and connectivity are perceived to directly influence the emotional state of the customer, and thus affect AES. Additionally, customisation, and ease-of-information access are by previous research stated to influence service excellence, and therefore suggested to indirectly influence AES. CES and AES are further two vital components of customer experience (Gentile, Spiller and Noci, 2007; Rose et al., 2012; van Noort, Voorveld, and van Reijmersdal, 2012), and thus proposed to affect the purchase intention (PI) of a product or a service.
Figur 1. A conceptual model of augmented reality customer experience (ARCE).
3. Method

3.1 Research Approach

In line with the literature review, the aim of this study is to increase the understanding of how an augmented reality application affects the customer experience. The few studies that have been conducted within the area have used a quantitative approach (e.g. Michaelidou and Dibb, 2006; Kim and Forsythe, 2007), which was one of the motives when choosing a qualitative approach. When using a qualitative method it can be difficult to replicate the study since the answers given by the respondents are subjective (Bryman and Bell, 2013). However, this approach will extend marketers understanding of AR-technology, and its effect on customer experience. Furthermore, a qualitative research has the ability to allow a deeper study of the respondents’ mind, and thus provide a more accurate representation of the customers’ subjectivity (Bulearca and Tamarjan, 2010; Bryman and Bell, 2013). The qualitative study was further influenced by a deductive approach in order to conceptualise the relationship between the conceptual model (see figure 1 in “Literature Review”) and research. According to Bryman and Bell (2013) a deductive approach possesses several important characteristics, such as testing concepts from a theory by operationalize them to interview questions, which in turn could enable empirical findings to be generalised.

3.2 Research Design

Research design has different implications in a study, especially on the reliability and validity. Therefore, it is vital that the researcher choose the most suitable research design to answer the posed research question (Bryman and Bell, 2011). Our research question: How does an augmented reality application influence customer experience? Required a search for an AR-application that was available for customers on the Swedish market. As stated in the purpose, IKEA’s new AR-application “IKEA Place” was selected as the research object. This application was chosen due to the limited number of AR-applications on the Swedish market. Furthermore, the furniture industry is a less explored area within AR, and therefore we found it interesting to study it. However, this application was rather new on the market, and thus it was not simple to find customers that had a long period of experience with the application. Consequently, respondents were contacted four to five weeks prior to the data collection in order to give them the possibility to gain experience with the technology. This kind of
approach fall into the category of quasi-experiment due to its certain characteristics of experimental design (Bryman and Bell, 2013). As this study had a qualitative structure, and thus did not fulfil all the internal validity requirements of an experiment, it was argued that the research question was best answered through a quasi-experiment with a qualitative approach. The aim of the study is not to draw general conclusions to all AR-application, but rather to make an in-depth study to understand the underlying aspects of how the technology can affect the customer experience. Another aim with this study is to shed a light on the difference between a website and an AR-application. The advantage of comparisons is that it gives a better understanding of the phenomenon when it is compared with something that is similar to it (Bryman and Bell, 2011). A central feature of any experiment is that it entails a comparison of result between different groups of the experiment (Ibid; Bryman and Bell, 2013), and therefore we argue that a research design with experimental nature is the right approach. The antecedents in the conceptual model were studied in-depth, and thus the study of these had an exploratory nature (Saunders et al., 2007). Furthermore, the focus of our research question is customer experience, and thus the outcome purchase intention (PI) will not be as extensively research as the antecedents. Therefore no proper conclusion can be drawn from this component. In sum, the choice of this method enabled us to gain deeper understanding on how an AR-application influences customer experience and further identify and build propositions for further research. Since we develop propositions on rich empirical data, Eisenhardt (2007) states that such propositions most likely are accurate, testable and interesting.

3.3 Data Collection

3.3.1 Interviews

Bryman and Bell (2013) provide information and principles of what should be done prior, during, and after a research study. For example, they suggest that all respondents should be provided with material prior to the interview, with information about the aim of the study as well as what topic the questions concern. Therefore, information was given to all the respondents to make sure they had an understanding why they were selected, the importance of their participation, and how the information from the interviews was going to be handled (Hermerén, 1938; 2011; Saunders et al., 2016). As mentioned above, the research design had characteristics of a quasi-experiment, thus all the respondents were asked to try IKEA’s
AR-application and/or their website four to five weeks before the interview. All the respondents were divided into three groups with six people in two groups and five people in one group. The first group was asked to only try the application, the second group’s task was to try IKEA’s website, and the last group was asked to try both the application and the website. The reason why two thirds were asked to try the technologies separately, was to minor an eventual Hawthorne effect. The Hawthorne effect occur when people within an investigation tend to look for clues and hints how they should adapt their behaviour according to probable expectations of the research (Bryman and Bell, 2013). Thus, three different tasks were handed out, in order to find data that was not affected by such impacts.

Semi-structured interviews were used to collect the data from the respondents. This kind of approach was chosen due to the exploratory nature of the research, which according to Saunders et al. (2016) is an appropriate data collecting method for this kind of study. Semi-structured interviews allowed the interviewers to ask follow up questions and moreover gain deeper knowledge about the subject. It is important to take into consideration that this method has some reliability issues due to its open nature (Kvale and Brinkmann, 2009). However, this approach was vital since the respondents were allowed to develop, interpret, and explain their thoughts when they answered, which is mentioned by Kvale and Brinkmann (2009) as positive aspects of the method.

Prior to the interview the respondents were informed that they would be anonymous, and the only thing we would take into consideration was their age, gender, and occupation. As stated above, all the respondents were contacted before the interview, and one more time a few days before the interview in order to provide them with all information. Furthermore, they were informed that the interview was voluntary, and that they could stop it if they wanted. All the respondents also gave consent that the interviews were recorded.

3.3.2 Interview Guides

Three interview guides were made prior to the interviews. The majority of the questions were related to the conceptual model ARCE (turn to “Operationalization”), and grouped to the twelve concepts: skill, challenge, telepresence, aesthetics, ease-of-use, customisation, ease-of-information access, service excellence, connectivity, cognitive experiential state
(CES), affective experiential state (AES) and purchase intention (PI) (see appendix 1). Due to the semi-structured nature of the interviews, the grouped questions around all the components can be questioned in various sequences dependent on the configuration of the interview (Corbin and Strauss, 2015). The nature of such interviews also gives the ability to add or take away questions during the interview session, and is dependent on the situation (Saunders et al., 2016). This was done during the interviews since the respondents had tried several or different technology areas prior the interviews. Therefore, assumptions were made and assessed since the respondents built their answers on different knowledge levels and might perceived questions in various ways. The interview guides (see appendix 1) are designed with questions that are connected to the theory. These questions were the foundation of the interviews, however, it was space for follow up questions and flexibility. This diminishes the problem with sticking to the subject during the interview, and at the same time makes space for unexpected answers (Kvale and Brinkmann, 2009).

Pilot studies were conducted prior the interviews, one for each interview guide. These pilot interviews gave valuable information, for instance questions that the respondents did not understand and questions that were too similar to each other. Furthermore, it was noticed that the time of the interviews were longer than predicted and therefore all the respondents were informed about the new approximately time of the interview. Kvale and Brinkmann (2009) state that a pilot study is valuable, as it makes sure that the researcher gain prompting, probing and accuracy experience. Furthermore it can discover any potential “blind spots” in the creation of the interview guides.

3.3.3 Conducting the Interviews

Some of the interviews were held through Skype due to difficulties to meet up for a face-to-face interview. Bryman and Bell (2011) on the one hand, state that interviews conducted through telephone and/or Skype might reduce bias effects for the respondent that come from the interviewer's body language or facial expression. On the other hand they mention the limitations with interviews when the interviewer and the respondent cannot see each other. These are for instance the difficulties to see how the respondent reacts to the questions, such as observations of confusion or facial expressions (Bryman and Bell 2011). To reduce such incidents some of the respondents used a camera during the call, and they
were also contacted via email with clarifications of the purpose to make them feel more comfortable.

All 17 interviews were conducted in different places, however it was secured that there were places where the respondent felt comfortable, in which they could speak freely. The duration of the interviews varied between 25 to 65 minutes and all interviews were recorded and transcribed, to ensure better accuracy and quality in the analysis of the interview material. This is in line with Alvehus (2013) who explains that it will help the interviewer to no forget important content from the conversation, which is one of the positive sides of transcribing interviews. The majority of the interviews were conducted in Swedish because the respondent felt more comfortable with that language. According to Kvale and Brinkmann (2014) different languages might lead to misinterpretations. A study is to a high degree based on interpretations and therefore an open-minded attitude was used, and according to Corbin and Strauss (2015) this is something the researchers should be conscious about. All the respondents were informed that they had the possibility to read the transcription to minor the risk of misinterpretations.

3.3.4 Finding and Selecting Respondents

In order to find and select respondents for the groups that required AR-technology, we needed to find respondents that owned an iPhone 6s or a newer version with the operative system IOS 11. The application “IKEA Place” did not work with other phones, and therefore it was crucial to find 11 respondents that possessed these requirements. It was easier to find respondents for the Online group because they only needed to visit the website, which was not a problem for them. Regarding the age of the respondents, we searched for young people that belonged to Generation Y (around 18-35 years old), who according to Fromm (2017) are mostly targeted by AR-applications. Generation Y is considered as an important group for companies, due to its significant purchasing power and they are often called digital natives (Parment, 2013). Furthermore, this generation belongs to the early adopters and therefore it is more likely that they adopt augmented reality (Fromm, 2017). The selection of the respondents is a limitation of the study. Age might have been a important factor and as we only picked respondents from Generation Y, we were not able to further explore this area.
<table>
<thead>
<tr>
<th>Respondent</th>
<th>Age</th>
<th>Occupation</th>
<th>Gender</th>
<th>Technology</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR1</td>
<td>26</td>
<td>Midwife</td>
<td>Female</td>
<td>AR-application</td>
<td>26 minutes</td>
</tr>
<tr>
<td>AR2</td>
<td>25</td>
<td>Customer Simplicity Manager</td>
<td>Male</td>
<td>AR-application</td>
<td>28 minutes</td>
</tr>
<tr>
<td>AR3</td>
<td>35</td>
<td>Web Director</td>
<td>Female</td>
<td>AR-application</td>
<td>27 minutes</td>
</tr>
<tr>
<td>AR4</td>
<td>24</td>
<td>Student</td>
<td>Male</td>
<td>AR-application</td>
<td>32 minutes</td>
</tr>
<tr>
<td>AR5</td>
<td>27</td>
<td>Customer Service Associate</td>
<td>Male</td>
<td>AR-application</td>
<td>38 minutes</td>
</tr>
<tr>
<td>AR6</td>
<td>23</td>
<td>Student</td>
<td>Male</td>
<td>AR-application</td>
<td>50 minutes</td>
</tr>
<tr>
<td>ON1</td>
<td>26</td>
<td>Teacher</td>
<td>Female</td>
<td>Online</td>
<td>42 minutes</td>
</tr>
<tr>
<td>ON2</td>
<td>25</td>
<td>Student</td>
<td>Female</td>
<td>Online</td>
<td>40 minutes</td>
</tr>
<tr>
<td>ON3</td>
<td>25</td>
<td>Project Leader</td>
<td>Female</td>
<td>Online</td>
<td>28 minutes</td>
</tr>
<tr>
<td>ON4</td>
<td>25</td>
<td>Student</td>
<td>Male</td>
<td>Online</td>
<td>56 minutes</td>
</tr>
<tr>
<td>ON5</td>
<td>27</td>
<td>Social Worker</td>
<td>Male</td>
<td>Online</td>
<td>33 minutes</td>
</tr>
<tr>
<td>ON6</td>
<td>27</td>
<td>Social Worker</td>
<td>Female</td>
<td>Online</td>
<td>35 minutes</td>
</tr>
<tr>
<td>ARON1</td>
<td>29</td>
<td>Journalist</td>
<td>Female</td>
<td>AR-Application + Online</td>
<td>57 minutes</td>
</tr>
<tr>
<td>ARON2</td>
<td>32</td>
<td>Buyer</td>
<td>Male</td>
<td>AR-application + Online</td>
<td>46 minutes</td>
</tr>
<tr>
<td>ARON3</td>
<td>24</td>
<td>Student</td>
<td>Female</td>
<td>AR-application + Online</td>
<td>65 minutes</td>
</tr>
<tr>
<td>ARON4</td>
<td>27</td>
<td>Consultant</td>
<td>Female</td>
<td>AR-application + Online</td>
<td>42 minutes</td>
</tr>
<tr>
<td>ARON5</td>
<td>26</td>
<td>Student</td>
<td>Female</td>
<td>AR-application + Online</td>
<td>48 minutes</td>
</tr>
</tbody>
</table>

Table 4. Illustrates an overview of the respondents and how they are referred to in the analysis.

### 3.4 Operationalization

The operationalization, illustrated in table 5, was made to form the theoretical concepts into interview questions. By breaking down the conceptual model (see figure 2), and transforming it to questions, it illustrates how the components from the literature review were defined, and how they were intended to be measured throughout the interviews. The interview guides were divided into three: AR-application, Online and, AR-application and Online. Furthermore, the questions were broken down into the theoretical model’s twelve concepts.
<table>
<thead>
<tr>
<th>Component</th>
<th>Key supporting literature</th>
<th>Question/Questions</th>
</tr>
</thead>
</table>
| Skill             | Novak, Hoffman and Yung (2000) | 3. Do you have any previous experience with AR and/or online shopping?  
4. Have you used an AR-application for shopping purposes before IKEA Place?  
5. How comfortable are you with your technology skills?  
6. Did your previous technology skills enhance the experience with the application and the website? |
| Challenge         | Novak, Hoffman and Yung (2000) | 7. How challenging do you think IKEA’s AR-application/website is? Did you feel that you had to use your capabilities to the maximum limit?  
8. With regard of your previous experience with technology, how did the application and website test your skills? |
| Telepresence      | Novak, Hoffman and Yung (2000); Mollen and Wilson (2010) | 9. Did you feel that you entered a new world while using the application/website?  
10. If you experienced this, did the real world come back when you stopped using the app and/or website? If you didn’t experience this, what limited you to not fall into this world? |
| Aesthetics        | Rose et al. (2012)          | 11. How important is the aesthetic feeling for you in an AR-application/on a website?  
12. What was your first impression of the look and feel of the application/website?  
13. How important is the aesthetics from a quality perspective? |
| Ease-of-Use       | Gefen (2003); Rose et al. (2012) | 14. How did you perceive the navigation of IKEA Place and IKEA’s website?  
15. How easy was it to use the application/website?  
16. How long did it take for you to learn how it operated and how it was structured? How did this affect the use of it? |
| Customisation     | McKinney (2004); Rose et al. (2012) | 17. How well did the application/website fulfil your personal demands? If the application/website did not fulfil your demands, what was missing?  
18. How important is it that the application/website meet your demands?  
19. Would you like to be able to customise the information in the application/website according to your own personal data? |
<table>
<thead>
<tr>
<th>Category</th>
<th>Reference</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ease-of-Information Access</td>
<td>Rose et al. (2012); Yaoyuneyong et al. (2016)</td>
<td>20. How easy was it to find the right information in the application/on the website?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>21. How easy was it to search for information in the application/website?</td>
</tr>
<tr>
<td>Service Excellence</td>
<td>Verhoef et al. (2009); Bulearca and Tamarjan (2010); Huang and Liao (2014)</td>
<td>22. How did you experience the service quality of the application and the website?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23. What was the service level if you compare it to the service in a physical store?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>24. How important do you think it is with provided service in an AR-application/on a website?</td>
</tr>
<tr>
<td>Connectivity</td>
<td>Rose et al. (2012)</td>
<td>25. How could the connection to other customers enhance your experience with the application/website?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26. How helpful do you think it is to see product recommendation from other customers?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28. How important is the overall flow to get a better experience while using the app/website?</td>
</tr>
<tr>
<td>Affective Experiential State (AES)</td>
<td>Rose et al. (2012)</td>
<td>29. How did you feel when you used the application/website?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30. How did your feelings affect the experience with the application/website?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>32. Did the application help your decision to buy a product online, for example a big furniture like a couch? (AR and Online)</td>
</tr>
</tbody>
</table>

Table 5. Operationalization of the interview guides.

As exposed in the table above, the cognitive components were mostly based on Novak, Hoffman, and Yung’s (2000) study. Their article is the first one that tried to connect the flow state with online shopping behaviour; therefore we argued that their work was most suitable for our study. However, they did not consider the affective concepts, and therefore Rose et al.’s (2012) study was used when operationalizing these concepts. Furthermore, other studies within the area were also taken into consideration when forming the questions. As mentioned in the literature review, there were a lack of qualitative studies on AR and customer
experience, as with online and customer experience, therefore all of these studies were based on a quantitative approach. Hence we had to transform the questions to a more qualitative nature as written in the interview guides (see appendix 1).

3.5 Data Analysis
Apart from the operationalization, coding of the material was done in order to make it more structured (Aspers, 2011). Kvale and Brinkmann (2014) state that by coding the material, the analysis will become more perspicuous. Aspers (2011) recommends to first do an inductive coding where the theoretical aspects are excluded from the material. By following this approach the researcher may detect surprising results that is not included in the theory, which can be difficult to discover with deductive coding (Ibid). Therefore, an inductive coding was chosen first. It should however be stated that the inductive coding was affected by the knowledge of the theoretical aspects, and the operationalization of the questions.

The research question and extensive literature review influenced the deductive coding process. This was mostly reflected in the operationalization of the conceptual model, which gave more pre-analytical concepts that was useful during the coding process (Bryman and Bell, 2011). According to Aspers (2011) colour coding is a popular and effective tool and therefore such method was chosen. The codes, as stated above, derived from the operationalization and conceptual model, and divided into twelve different colours. The inductive coding was mainly done through a coding protocol where we wrote down the codes that were detected. We believe that the method for analysing the data provided the result to answer the research question. Furthermore, given the fact that the data was first analysed through an inductive approach, and then applied with a deductive approach, the data have been analysed in a thorough way, which probably improved the result.
4. Empirical Findings and Analysis

4.1 Cognitive Experiential State (CES)

4.1.1 Skill

All AR-respondents considered themselves to have at least average technology skills. They all had previous experience with smartphones, and thus they know how to operate them. It was only one respondent, AR4, who had tried AR-technology for shopping purposes before, however his experience was from a human-computer interaction and not from a smart device. This encounter was not a positive experience due to the use of a webcam, which made it, according to him, both “unstable and difficult”. The rest of the respondents within the AR-groups had only tried AR-applications that were not linked to shopping sites, such as Pokémon-GO\(^1\), and Snapchat\(^2\). ARON3 did not think this lack of experience with AR-technology when shopping was an obstacle while using the application. She explained that due to her previous experience with mobile phones, she knew how to move the virtual objects, and how to change their size by touching the screen, and thus she thought IKEA Place was quite easy to operate. It was therefore evident that due to the respondents’ skills, and previous experience with smart devices, the majority of the respondents had a form of control over IKEA Place (Csikszentmihalyi, 1997; Novak Hoffman, and Yung, 2000):

> I am pretty used to smartphones and other applications, so I know how to navigate through it [IKEA Place]. It might be more difficult for someone who has not used smartphones, or an application before. (ARON4)

As stated in the quote, ARON4 knew how to navigate and control the navigation due to her previous experience with smart devices (Ajzen, 1985; Novak Hoffman and Yung, 2000). AR1 and ARON3 argued that their technology skills definitely enhanced the experience with IKEA Place, and thus skill might be an important factor. However, none of the respondents perceived themselves to have poor technology skills, which might indicate that skill is not a vital factor for their generation (Rose et al., 2012):

\(^1\) Pokémon GO is an augmented reality game that lets people catch Pokémons (virtual objects) in the real environment (Denham, 2016).
\(^2\) Snapchat is an AR-application that allows the user to apply virtual filters and objects in the real environment (Snapchat, 2018).
I would say that I am above average [skill]. If I compare myself with my parents, then I am a hundred times better than they are [...] If I would give it [IKEA Place] to someone who is not used to smartphones, then that person would probably not be able to know how to move things around. (ARON3)

Despite the advantage Generation Y is perceived to have with interactive technology, a few of the AR-respondents found it somewhat tricky to learn how IKEA Place operated. For example AR3, who was the oldest respondent, did not know if it was the application or her skills that hindered her from having control over the application:

*It really tested my skills. I had to think: ‘What is wrong? Or is it me, or what?’* (AR3)

It could be argued that her age played a central part when she questioned her skills. However, other similar uncertainties arose among younger respondents. ARON3 and ARON5 quickly brought up their technology skills when something did not work. ARON3 stated that her skills might have hindered her to combine two virtual objects. Furthermore, ARON5 explained that she felt much more comfortable with the website than the AR-application, which could be due to her lack of experience with AR-technology. Hence, skill may be an important factor for the customer experience. However, in today’s society, the majority of the customers that operate AR-technology are foremost from Generation Y (Fromm, 2017), and younger generations, thus skill might become less of a problem in the future.

It was evident when comparing the website with the AR-application that skill was not as important for the website. None of the respondents questioned their technology skills when they encountered a problem with IKEA’s website. ON2 and ON4 stated that they sometimes had to think a little bit harder when discovering new tools on the website, such as 3D planning. However, they never questioned their skills when a problem occurred, instead they blamed the structure of the website. Furthermore, all the respondents from the online-groups had visited a website before, and therefore knew how it operated:

*I know how a website works [...] How it is structured. I know how to navigate to come to the stuff that I am looking for.* (ON1)
All websites are structured in the same way. You know why you are there. You expect to see what you see [...] (ON4)

This confirms previous studies on online customer experience, which show that skill is not an important factor for online experience (Rose et al., 2012), since customers today are more comfortable with websites than in the 1990s when Novak and Hoffman first conducted their study. However, this is not as evident in the case of the AR-application. All of the AR-respondent perceived to have average skills. Nevertheless, a few of them questioned their skills when they encountered a problem, which was not the case with the website.

4.1.2 Challenge

According to Ellis et al. (1994) users will become bored and anxious online if a website does not offer them some sort of challenge that is congruent with their skills. This was however not the case for 15 out of 17 respondents. It was only two of them, AR4 and AR5, who did not, as Novak, Hoffman and Yung (2000) call it, find any action with the application, and therefore quite quickly lost the interest in it:

It did not test my skills. I thought it was too simple to find it stimulating. (AR4)

It can be argued that AR4 reached a state of boredom due to the low level of challenge and high level of skill (Ellis et al., 1994; Wells, 1988; Novak, Hoffman and Yung, 2000). However, the rest of the respondents did not have any objection to the low level of challenge of IKEA Place. For example, ARON3 argued that action in the application is not an important factor, on the contrary; she thought that more challenge would disrupt the utility aspect of it. This is similar to what the rest of the respondents thought when asked about the challenge level. It is clear when comparing the application with the website, that the majority of the online respondents found IKEA’s website to be boring, which can be compared to the feeling of high skill level and low challenge (Novak, Hoffman and Yung, 2000):

It [the website] was so boring. So boring. It also became so hands-on when you compared the application with the website. (ARON3)
This can further be backed up with Rose et al. (2012), who find that challenge is an important factor for the customers’ online experience. However, as mentioned above, only two of the AR-respondents expressed the feeling of boredom during for the application, the rest did not perceive this to be of importance. It can be argued that all the ARON-respondents who found the website to be more boring than the application, thought that it was due to the higher “action-level” on IKEA Place which the website not offer to the same extent.

4.1.3 Telepresence and Flow

Regarding the telepresence of IKEA Place, only two respondents, ARON3 and ARON4, experienced some kind of telepresence. Their feelings were similar to how Mollen and Wilson (2010) define it, that it is a psychological state of ‘being there’ in a computer-mediated environment:

- It feels like the The Sims[^1], and I really imagined how it looked like in my room and it became like integration between reality and the application. (ARON4)

- It is like stepping into a new world because it feels like a game. (ARON3)

These two respondents further expressed a positive feeling with the application, which Fiore et al. (2005) argue to be a common outcome of telepresence. ARON3 and ARON4 were the only respondents that experienced some sort of flow in the application. This confirms Novak, Hoffman and Yung’s (2000) study, which conclude that flow is enhanced by telepresence. To have flow, as ARON3 and ARON4 had, is according to Csikszentmihalyi (1997), an ‘optimal experience’, which probably was the case for these two respondents who are the only ones who had a clear positive subjective experience (Novak, Hoffman and Yung, 2000) towards IKEA Place.

However, as stated above, the majority of the respondents did not experience telepresence or flow. When asked what hindered them to feel it, AR1, ARON2 and ARON5 argued that it was due to the aesthetics and/or the “clumsiness” of IKEA Place. The poor quality of the

[^1]: The Sims is a game where the player can create virtual people and place them in virtual houses that the player has constructed (Mahardy, 2014).
virtual objects distracted them from getting sucked into the virtual world. Furthermore, the way the application operated also led them to only be presence in the real world:

Zero [flow]. So far away from flow you could get. It is a clumsy application, and it is not so good-looking either so... I absolutely did not experience any kind of flow with that application [...]. (ARON2)

All the respondents had similar feelings towards IKEA’s website. According to the majority of the respondents, the website had too much information. ON4, ON5 and ON6 argued that there were so many steps to reach the goal, that they constantly got interrupted. ARON3 further thought the website to be boring, especially when she compared it to IKEA Place. She just wanted to do what was necessary on the website, and then leave. ON5 had similar feelings:

I did not experience flow. It was not flow-friendly [the website]. You want to be able to sit and scroll around without getting disturbed with problems, and it was not appealing aesthetically. It is more informative than ‘flow-friendly. (ON5)

It is evident that both flow and telepresence to some extent influence customer experience. This further support the concept of flow, which states that telepresence is an antecedent of online customer experience (Novak, Hoffman and Yung, 2000). Rose et al. (2012) also find this to be true for shopping online, which proves to be in line with this study.

4.2 Affective Experiential State (AES)

4.2.1 Aesthetics

Pine and Gilmore (2011) mention aesthetics as a core factor that influence customer experience. AR2, AR3, AR4 and AR5 stressed the importance for an application to have a good design. This might be an indication that all of them value aesthetics to establish a better experience with the application. AR4 stated that the better aesthetics and interactivity an application has, the more you will use it. He further explained that he had used more inviting applications than IKEA Place. According to Eroglu, Machleit and Davis (2003) aesthetics are of importance in online stores, which almost all of the respondents agreed on. However, some of them thought the aesthetics within the application were good, while the majority of the
respondents’ thought the application was less well designed and that improvements were needed.

Today, customers do not highly value companies efforts on creating great visual design on their websites (Rose et al., 2012). However, AR5 and ARON4 mentioned aesthetics as a factor that has the possibility to create a realistic picture of the products. According to AR2, good aesthetics are taken for granted, and this might be one reason to why customers are less interested in companies’ efforts. Nonetheless, according to the majority of the respondents the virtual objects did not attain their expectations, and this could be a sign of customers interest in companies actual effort to design good applications. ARON1 also mentioned that she will use IKEA Place to a larger extent if the quality of the objects will be improved and that the application worsening the image of the products, since it looked ugly. ARON2 stressed how important it is that IKEA look over this problem as it is vital that they deliver a well-designed application. AR1 further agreed on this:

*The objects look fake, copy-pasted and unreal. This annoyed me when I used IKEA Place. (AR1)*

ARON5 demonstrated the differences that applications have to be more well-designed than “a simple website as IKEA’s”, since the AR-technology is created to show how virtual objects fit into the reality. However, all of the online respondents, ON1 - ON6, also stated the importance of the aesthetics for websites.

*Aesthetics are of importance, especially when it comes to furniture, otherwise it might be difficult to visualise what it can look like. (ON1)*

This might be a sign that the layout, colours and design as Erouglu, Machleit and Davis (2003) mention, are to some degree factors that affected the respondents online experience. ON3, ON6 and ARON3 further argued that if the quality of the website or the application is not as good as it can be, it might reduce the image of what quality a company’s products have. ARON5 explained the fact that IKEA Place had some similarities to a “Snapchat filter”,

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since the virtual objects felt dishonest and unfaithful. This might be an additional sign of the importance to design and create platforms with preferably aesthetics.

4.2.2 Ease-of-Use

According to Rose et al. (2012) ease-of-use includes the navigation and how this affects the affective behaviour. This seems to be the case for AR1, AR2 and ARON4 who mentioned how easy it was to start using the application and how the uncomplicated navigation enhanced their experience:

IKEA Place had good instructions, I understood it quite quick and I think it was a manageable application. The experience was enhanced due to the applications simplicity. (AR2)

However, AR3 and AR5, who struggled with the application’s scanning process, also seemed to have less perceived control over the application. The time it took to understand how it operated reduced the continued interest of the application (AR3 and AR5). ARON2 and ARON5 further explained how they struggled with the size of both the room and the furniture they wanted to place in it. In accordance with this, Rose et al. (2012) explain that ease-of-use is related to problems with navigation and less control of the technology. This might have been the feeling for the respondents when they struggled with IKEA Place. Rose et al. (2012) also mention that this can affect their willing to revisit the platform, which might be an eventual outcome for these respondents. According to AR4, IKEA Place was the best AR-technology experience he ever had for shopping purposes. This was mostly due to the portability of the application, which Javornik (2016a) argues to be one of the positive aspects with mobile AR-technology. Almost all respondents in all the three groups, thought the application and the website were easy to use, with some exceptions:

The website is super intricacies while the application is much easier. (ARON3)

As previously mentioned AR3 and AR5 had some difficulties with the application, and ARON2 had some limitations due to his small apartment. According to ON2-5 there were too many steps on the website to find the right products, and some of them had problems to
return to previous visited products. ON4 further expressed the importance of having simple online stores to enhance customers’ willingness to buy online. According to Ducoffe (1996), Tsang, Ho, and Liang (2004) and Verhoef et al. (2009) it is important to take into consideration how technology failures and errors affect customers’ further use of the platform. Therefore, the problems some of the respondents had might affect their proceed using IKEA Place and IKEAs website in the future.

4.2.3 Ease-of Information Access, Customisation and Service Excellence

The majority of the respondents in the AR-groups mentioned that they had some troubles to find information about the products in the application. This is according to Yaoyuneyong et al. (2016) a factor that might reduce their patience. According to AR1 she had to use the website to complement with more information that the application did not provide her with. Such action might have negative impacts on the customer, which is in line with what Rose et al. (2012) point out; that wrong or limited information can reduce the purchase intention. According to Javornik (2016a) it is good with visible and easy search functions. However, ARON1-5 mentioned that it was difficult to find it on IKEA Place compared to the website. Furthermore, ARON3 and ARON5 pointed out that by combining the website and the application they get the most valuable information. From their point of view this might be a proof that the application does not provide customers with enough information:

*It is easier to see what material a couch has when looking at the images on the website.* (ARON3)

Moreover, AR2 and AR5 explained that their demands were not fully met, since the application was not fully developed. However, they mentioned that since IKEA Place is quite new on the market, it has good potential for improvements:

*I do not want to place all products all over again, it has to be efficient.* (AR2)

AR4 and ARON3 thought the application met their demands when they were able to “try” the furniture at home. According to Rose et al. (2012) the customer experience is enhanced when
the platforms can meet the customers’ demands. It is visible in this case that the application needs a lot of functionalities due to various demands from different customers. McKinney (2004) and Rose et al. (2012) mention that the possibility to customise enhance the customer experience. According to the majority of the respondents customised suggestions would be good. ARON5 argued that customised recommendations might enhance customers willingness to stay longer on the website or on IKEA Place. However, some of them pointed out the importance to achieve relevant customised information. ON1, ON5 and ON6 argued that this is not important when buying furniture, since one already know what to buy when looking for such products which results in high-involvement purchases. Thus, customised suggestions and recommendations might depend on the industry.

According to ARON4 the service availability was clearer on the website than in the application. However, she preferred to visit a physical store. ARON5 stressed that the customer service should be more visible on the application, and AR4 and AR5 called for for a service where IKEA send a message such as: “do you need help?” AR4 further mentioned the importance of providing service in the application since you were not able to physically talk to someone when using it. AR5 explained that he used applications and websites generally to get quick service. Overall the respondents mentioned how in-store service is better than the service provided in the application and online. This is in line with Bulearca and Tamarjan (2010) who state that the AR-applications do not provide the same service level as the in-store services. However, they further state that it is unclear how much it differ between the application and in-store service. Nevertheless, some of the respondents mentioned that it is one kind of service to be able to buy online instead of going to a store to make a purchase. It might be a sign that as long as customers are satisfied with the service online and in the application, they see the online buy as the best service. However, ARON1 and ARON5 stated that the service on IKEA’s website compared to IKEA Place’s was easier to access. Verhoef et al. (2009) highlight the fact that the service level affects the customer experience, however they state that the involvement might change it. This is something that is connected to what ON6 mentioned, that the in-store service is better to answer more complex questions.
4.2.4 Connectivity

Verhoef et al. (2009) state that connectivity is important for the experience, and previous research explain it; as customers who give advices and interact with each other online (Hagel and Armstrong, 1998; Kozinets, 1999; Hanna et al., 2011; Pescher et al, 2014). According to AR1, AR3, AR4, AR5, AR6 and ON2-6 reviews and advices are of importance when shopping online, since it helps them to make a better judgement about the product and hopefully one can do better purchase decisions. AR2 explained how other customers’ involvement can enhance the experience:

 [...] it would be good if you were able to see how other customers have done with their previous purchases. For example how they have matched the chosen table with chairs and further how they have placed it in their home. (AR2)

This is in line with Rose et al. (2012) who explain that connectivity gives a better confidence and Calder et al. (2009) who mention that this enhance the purchase probability. According to Shankar and Balasubramanian (2009) and Varadarajan et al. (2010) smart devices give the opportunity to easily interact with other customers. In line with this ARON3 explained how sharing functions can be valuable for the application since you might want to share the furniture you have placed in the room, before you make a purchase. ARON4 further mentioned that this is of importance for both the application and the website, and thus it might need to be as easy for both platforms. However, it should be noted that the majority of the respondents did not think about the connectivity before the interviewers mentioned it, and thus it was not perceived to affect their experience to a larger extent.

4.3 Utility and Hedonic Value

During the interviews some emotional benefits with the application emerged, that primarily was related to IKEA Place’s perceived playfulness (AR1, AR3, ARON1, ARON3, ARON4). This hedonic aspect is similar to other studies on AR (Javornik, 2016a; Kim and Forsythe, 2008), where the technology has been perceived as too ‘gimmicky’. For example, ARON1 mentioned how the application was more of an entertainment tool:

I had a The Sims feeling when I used IKEA Place, I played around a bit. (ARON1)
This playfulness of the application was however not a reason why ARON1 was interested in IKEA Place. She was not a fun and enjoyment seeker (Holbrook and Hirschman, 1982). Instead she craved some kind of utilitarian benefits with the application. According to AR1, ARON1, ARON2, the application felt like a game due to the poor quality of the virtual objects, and thus the hedonic aspect seemed to affected their experience (Javornik, 2016a; Kim and Forsythe, 2008). However, ARON3 and ARON4 perceived the playfulness of the application to be a positive aspect:

You can really see how it fits. You save both time and energy, and the application makes you want to use it even more and buy more things. On the website, you only want to do the basic stuff. It is no experience at all. (ARON3)

AR4, AR6 and ARON4 further mentioned how the application was a good complement to the website and how the application enhanced the positive attitude to IKEA since you were able to “try” the products at home. According to ARON4 and ARON3, IKEA Place fulfilled both the values, and it could be argued that they perceived it as a balanced platform (Gentile, Spiller Noci, 2007). However, few of the respondents saw the utilitarian benefits with IKEA Place. This supports the literature review on how enjoyment and hedonic value had a stronger impact on the consumer behaviour than the utility value (Kim and Forsythe, 2008; Chan and Li, 2010; Huang and Hsu Liu, 2014). Although some of the respondents found it to have features of a game, they still craved the utility aspects, as this was a main reason why they needed the application. For example, AR1 did not trust the application, as she was not sure it gave the right measurements (Kim and Forsythe, 2008). As for the website, the online respondents found the website to only have utilitarian value but no hedonic, which the majority of the respondents seemed to perceive as a negative aspect.

4.4 Purchase Intention (PI)

The application really enhanced the willingness to buy a product. I can quickly see if it [the furniture] fit or not, style wise, but also if it fit in a practical matter. Thus, I can do a fast purchase decision. (ARON3)
As stated in the quote, ARON3 explained that IKEA Place enhanced her willingness to buy a product. AR4, AR6, and ARON4 also argued that the application inspired them, and triggered their willingness to buy a product, as you were able to see the furniture at home. As mentioned above, ARON3 and ARON4 were the only respondents that experienced some kind of flow in the application, and therefore it can be argued that flow influenced their purchase intentions (Chang and Wang, 2008; van Noort, Voorveld and van Reijmersdal, 2012; Rose et al., 2012). However, AR4, ON1, ON2, ON4, ON6, and ARON5, stressed the importance to be able to touch and feel the product before making a purchase decision, and therefore neither the application and/or the website enhanced the willingness to buy a product (Bulearca and Tamarjan, 2010). AR1 and ARON2 further explained that they did not feel any purchase intention when they used the application and that it was mainly due to the poor quality of the virtual objects (Schwartz, 2011).

4.5 A New Component: Assortment

A new component that surfaced during the interviews was assortment. This component proved to be an important factor for the AR-application, and clearly influenced the experience of IKEA Place:

[…] All the products on the website did not exist on the application. For example, I looked at a couch on the website and wanted to see how it looked like in my room but I could not find it in the application (ARON4)

ARON4 mentioned that the large amount of products on the website did not match with the application and therefore she was not able to try them when using IKEA Place. Furthermore, AR3 stated that she probably would not use the application again due to the lack of assortment. ARON2 and ARON5 also mentioned the problem with the range of products, and how they became frustrated when their products were not available. This might be a sign that the ones who tried both the website and the application noticed the lack of products to a larger extent than the respondents who only tried the application.
4.6 Summarisation of Findings

This thesis was set to answer the research question: *How does an augmented reality application influence customer experience?* To do so, IKEA’s AR-application IKEA Place was studied. The result showed that the antecedents of both the cognitive and affective experiential state had an impact on the customer experience. Furthermore, by comparing IKEA Place with IKEA’s website, there were proved similarities and differences between the platforms. In the table below we have done a summarisation of the most important findings between the AR-application and the website.

<table>
<thead>
<tr>
<th>Component</th>
<th>IKEA Place</th>
<th>IKEA’s website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skill</td>
<td>The majority of the respondents had average technology skills. However, some respondents questioned their skills when problem occurred, and thus it could be suggested that skill did to some extent affect the customer experience</td>
<td>The majority of the respondents had average technology skills. They never questioned their skills, and thus skill did not affect the cognitive experiential state.</td>
</tr>
<tr>
<td>Challenge</td>
<td>None of the respondents perceived it to be challenging.</td>
<td>None of the respondents perceived it to be challenging.</td>
</tr>
<tr>
<td>Telepresence</td>
<td>Two respondents (ARON3 and ARON4) experienced telepresence.</td>
<td>None of the respondents experienced telepresence</td>
</tr>
<tr>
<td>Flow</td>
<td>Two respondents (ARON3 and ARON4) experienced flow.</td>
<td>None of the respondents experienced flow</td>
</tr>
<tr>
<td>Aesthetics</td>
<td>The majority of the respondents found the aesthetics of the virtual objects to be of poor quality.</td>
<td>The majority did not like the aesthetics of the website, e.g. text, logo, colours.</td>
</tr>
<tr>
<td>Service Excellence</td>
<td>The respondents hinted of limited service within the application.</td>
<td>The majority of the respondents found it easy to access service in terms of a chat, good information etc.</td>
</tr>
<tr>
<td>Ease-of-Use</td>
<td>The majority of the respondents found it easy. However some of the respondents (AR1, ARON2 and ARON5) found it “clumsy” and had difficulties with the scanner.</td>
<td>The general response was that it was easy to use, and nothing special hindered them to use it.</td>
</tr>
<tr>
<td>Ease-of-Information Access</td>
<td>It was not that easy to access information, many felt that it was limited product information.</td>
<td>Good information access, where all of the respondents found necessary information.</td>
</tr>
<tr>
<td>Customisation</td>
<td>No customisation, but the majority of the respondents preferred customised service and suggestions.</td>
<td>No customisation, but the majority of the respondents preferred customised service and suggestions</td>
</tr>
<tr>
<td>Connectivity</td>
<td>None of the respondents accessed it. However, many liked the idea of it.</td>
<td>None of the respondents accessed it. However, many liked the idea of it.</td>
</tr>
<tr>
<td>Purchase Intention</td>
<td>The majority of the respondents did not perceive it to enhance their purchase intention by only using the application.</td>
<td>The majority of the respondents did not perceive it to enhance their purchase intention by only visiting the website.</td>
</tr>
</tbody>
</table>

Table 6. Summarisation of the empirical findings
5. Discussion

In the following chapter we will highlight the most vital findings of the study. The chapter will further elaborate on the findings from the qualitative study, which will in turn lead to formulation of proposition for further research within the area of augmented reality.

5.1 General Perception of IKEA Place

After analysing the findings we can conclude that the study to some extent support previous research within the field of interactive technology. Similar to other studies within online customer experience (e.g. Rose et al., 2012), skill proved to not have any great impact on the customer experience. However, as stated in the analysis, a few of the respondents did question their skills when using the application. This was especially evident when we compared it to the website, where none of the respondents questioned their skills when a problem occurred. Therefore, we can assume that there is still a lack of hands-on experience with AR among members of Generation Y. Hence, companies should take this aspect in consideration when developing AR-applications. However, AR is constantly growing in popularity and customers become more and more familiar with it. Thus, it can be suggested that skill is not a critical component when developing an AR-application.

Moreover, the absence of challenge was not perceived as a problem. However, a vital definition of challenge is the lack of boredom, which was the case for the website, not the application. Thus, some of the respondents’ skill level might have been in balance with IKEA Place’s challenge level, but not with the website’s. However, to draw more conclusions around this component, further studies need to be conducted. The boredom of the website could also be due to the lack of fun and new features that the AR-technology provided them with, as this was especially evident for the respondents who both tried the website and the application. However, the fun (hedonic) feature also made the application to be perceived as more ‘gimmicky’, than utilitarian (Javornik, 2016a; Javornik, 2016b).

As for the affective antecedents it was evident that aesthetics and ease-of-use were the most important components, as these perceived to affect the affective experiential state (AES) and also cognitive components such as telepresence. Ease-of-information was also a factor that
was perceived to be absent from the application and thus in some way, influenced the experience level. The findings indicated that connectivity was of interest when the topic came up during the interviews. However, none of them perceived it to influence their experience, since none of them thought about the connectivity when using the application. The rest of the components; customisation and service excellence, were not easy to analyse due to the various responses we got from the respondents. Hence, no pattern could be drawn from them. In the following sections we will further explore the most vital components that perceived to influence the augmented reality experience.

5.2 Augmented Reality as a Utility Tool for Customers

Our main focus for this study was to explore the antecedents of customer experience. However, as mentioned in the theory, value is of great importance when exploring the customer experience, both the hedonic and the utilitarian value. These components were not a part of our conceptual model, but proved to be of importance when coding the interviews.

In order for companies to enhance the customer experience they need to provide the right value for their customers. If this kind of application only provides the customer with a hedonic value, the users will quite quickly become bored of it. By enhancing the quality of the virtual objects in AR-applications, and maybe improve the liability by including measurements of the objects, and enhancing the colour of the products, customers might find it to provide more of a utilitarian value. If the respondents were primarily fun and enjoyment seekers (Holbrook and Hirschman, 1982) then they might have enjoyed IKEA Place. Therefore, companies, which develop AR-applications, will probably not provide their customers with a full experience, if the gaming features overcome the functional benefits with the technology. By excluding the utility tool, the customers might not perceive the objects as trustworthy, and thus they will not see the point of using the application. However, this does not suggest that all the hedonic features should be removed, because the fun aspects are also perceived to attract the customers. Hence, they should provide a balanced platform where both the hedonic and the utility value are presented (Gentile, Spiller and Noci, 2007).

Proposition 1: Both hedonic and utilitarian values are needed to enhance the customer experience in an shopping environment when using an AR-application.
**Proposition 2:** The greater level of utilitarian value of an AR-application, the greater level of enhanced purchase intention (PI).

### 5.3 AR-Technologies Connection to Enhanced Purchase Intention

As mentioned in the method section, purchase intention was not the main focus in this thesis. Nevertheless, it was an interesting component to study. The findings indicated that only four of the respondents found that the application enhanced their willingness to buy a product. It could be further argued that two of these respondents reached both the affective and cognitive experiential state, which might have enhanced their purchase intention. However, due to limitations of chosen method, we cannot draw any general conclusions for this component.

The findings supported previous studies on purchase intention where customers prefer to visit a physical store before making a purchase. This proved to concern both the website and the application. The customers still want to be able to touch and try the product before buying it, especially high involvement products such as big furniture. Furthermore, two respondents stressed that the quality of the virtual objects in the application hindered their willingness to buy a product. In order to determine if an AR-application actually influences the purchase intention, more quantitative analysis should be conducted in the area. It is not possible for us to see a pattern from our qualitative study. However, we made a proposition from our findings that can be used in future studies within this area.

**Proposition 2:** The greater level of customer experience for an AR-application, the greater level of purchase intention (PI).

### 5.4 Better Assortment - For a Better Experience

As mentioned in the analysis, a new concept surfaced during the interviews: assortment. This concept should not be ignored, as it seemed to affect the majority of the respondents in some way, when having shopping purposes. Therefore, we state that this component is of importance as the rest of the components in the model, and thus it should be included in the conceptual model ARCE. As the assortment affected the respondent’s emotional state, we
argue that it should be an antecedent of AES. We are aware about the AR-applications early development stage and that improvements probably are around the corner. However, companies should be attentive of an eventual loss of customers, especially since the findings suggest that assortment is of importance. In terms of IKEA, they can potentially see greater assortment as a competitive advantage, and further enhance customers experience with the AR-application. If IKEA does not improve their assortment in the application, their customers will probably visit the stores and website to fulfil their demands better, since all the products are available there.

**Proposition 3:** The greater level of assortment in an AR-application, the greater level of affective experiential state (AES).

### 5.5 Telepresence - An Important Antecedent for Better Customer Experience

As previous research has shown, our findings demonstrate that telepresence seemed to affect the flow state more than other cognitive antecedents. The majority of the respondents argued that they did not experience any telepresence due to the poor quality of the virtual objects (aesthetics) and the “clumsiness” (ease-of-use) of the application. Prior to the research we did not expect this connection between these three components. Hence, we argue that aesthetics and ease-of-use affect telepresence, which in turn might potentially improve the customer experience. IKEA Place should therefore take into consideration the quality of the virtual objects and eliminate any form of ‘clumsiness’ in the application. By working towards the goal to create better telepresence for customers, platforms would probably be better recognised and appreciated. In today’s society this is vital due to the large amount of platforms and the on-going digitalization.

**Proposition 4:** The greater level of aesthetics, the greater level of telepresence in an AR-application.

**Proposition 5:** The greater level of ease-of-use, the greater level of telepresence in an AR-application.
6. Concluding Remarks

The purpose of this thesis was to explore how an AR-application influences customer experience. Since there was limited research within AR and customer experience, we had to build our own conceptual model (ARCE). As the model derived from literature within interactive technology (e.g. websites) and AR, the study also explored the connection and differences between the two technologies, in this case a website. As already concluded in the discussion, an AR-application perceived to influence the customer experience, and it did to some extent influence the experience in similar ways as a website. However, due to different features between the platforms, certain antecedents of the ARCE-model were more influential than others (aesthetics, ease-of-use and ease-of-information access), and as stated in the discussion a new antecedent emerged: assortment. Additionally, the hedonic utility value of the AR-application are also perceived to be of importance for the customer experience.

The findings indicated that aesthetics and ease-of-use influenced the affective experiential state, and also the cognitive state in terms of telepresence. Aesthetics was also perceived as an important factor for the utility value of the application, as the poor quality of the virtual objects decreased the trustworthiness and increased the hedonic aspect. In line with this, the utility value was also reduced due to the limited information access and limited assortment in the application, which can be found on the company’s shopping website. Consequently, customers today perceive AR-applications to offer more hedonic than utility value. However, the hedonic value had also to some extent a positive impact on the experience. Hence, in order to deliver the ultimate augmented experience, it is suggested that companies should find a balance between these two values, and not focus solely on one. By improving the aesthetics of the application, add more information about the products and expand the assortment, the customer experience will most likely increase.

In sum, AR-applications today do not seem to influence the customers in the best possible way. Hence, before companies develop AR-applications they should take these vital components into consideration. Without these insights, customers will probably not find any use with the application and thus the investment of the application will not be as good as it potentially can be.
6.1 Contribution
While the results for this study are particularly connected to IKEA Place and IKEA’s website, it makes some contributions to our understanding of how AR-applications influence the customer experience. The study provides empirical support for a comprehensive model of augmented reality customer experience (ARCE) not previously found in the literature, and also evidence what antecedents that may potentially influence the augmented reality experience. AR-technology cannot be perceived as another interactive technology, and thus this study extends the research within the area by contributing with a new model of customer experience for AR. Furthermore, the qualitative methodological approach contributes to a deeper understanding about AR-technology. Another contribution is the new component assortment that emerged during the study, which previous literature had not taken into consideration. The findings further indicated that aesthetics and ease-of-use directly influenced the cognitive antecedent telepresence, which opens for further research within this area (turn to propositions).

We also believe that the findings will be of interest for companies that plan to develop their shopping online platforms. These findings can probably be valuable contributions for companies due to the rapid on-going technology developments in today’s society. In sum, this study has created a piece of the holistic understanding on how AR-applications influence customer experience, which contributes both to the theoretical knowledge within this area as well as for companies on the market.

6.2 Implications for Practitioners
For companies that use AR-applications it is of importance to be aware of how they can utilise the antecedents that influence customer experience. By using the findings from this study they will receive better control how these can enhance and impact their customers who potentially will use the application. As mentioned in the concluding remarks, this study shows what antecedents that create distinct difference to a better AR-application experience. Companies that have an AR-application for shopping purposes or contemplate to develop one should ask themselves questions as: How can we create an application that provides our customers with utility value? How can we make the application as an independent tool, and
not only as a complement to other platforms? How can we make it credible for customers? Overall, how can we develop an application that influence and incorporate all demands a customer needs to get a good customer experience? When it comes to such questions this study and the findings hopefully can enhance their understanding how they should adapt the application to the market.

6.3 Further Research

Our propositions have built a base for further research within the area. In addition to these propositions, we have also identified that further in-depth studies have to be done in order to provide a generalisable result, be able to explore more variables and also how or to what extent variables are connected to each other. It would also be of interest to further study the weight of each variable, in other words how important each variable is compared to the others by making a quantitative research. Since this study does not take the respondents previous technological skill into consideration, it might be an idea to further investigate how their current skills affect the result. Finally it would be interesting to study how different industries need to work with AR-applications to create greater customer experience and also how these industries would differ from each other.
References


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Appendix 1: Interview Guides

Interview Guide 1: Augmented Reality-Application (IKEA Place)

General Questions

1. How old are you?
2. What is your current occupation?

Skill

3. What kind of previous experience do you have with augmented reality?
4. Have you used an AR-application for shopping purposes before IKEA Place? If so, what kind of application? How did you experience it? If no, why haven’t you tried one?
5. How comfortable are you with your technology skills? For example with computers, mobile phones, games etc.
6. How did you experience IKEA’s AR-application? Did your previous technology skills enhance the experience? If so, how? If not, why?

Challenge

7. How challenging did you think IKEA’s AR-application was? Did you feel that you had to use your capabilities to the maximum limit? If so, how? If not, why?
8. With regard to your previous experience with technology, how did the application test your skills?

Telepresence

9. Did you feel that you entered a new world while using the application? For example; forget your surroundings, and where you were? Please elaborate on this experience.
10. If you experienced this, did the real world come back when you stopped using the app? Please elaborate. If you didn’t experience this, what limited you to not fall into this virtual world?

Aesthetics

11. How important is the aesthetic feeling for you in an AR- application? For example, the virtual objects and the design of the application.
12. What was your first impression of the look and feel in the application? Did something bothered you? If so, what?
13. How important is the aesthetics from a quality perspective?

Ease-of-Use

14. How did you perceive the navigation of IKEA Place?
15. How easy was it to use the application? Is it quick, easy, or difficult?
16. How long did it take for you to learn how it operated and how it was structured? How did this affect the use of it?

Customisation

17. How well did the application fulfil your personal demands? Give an example. If the application did not fulfil your demands, what was missing?
18. How important is it that the application meet your demands? For example, remembering your previous shopping data, personal information etc?
19. Would you like to be able to customize the information in the application according to your own personal data?

Ease-of-Information Access
20. How easy was it to find the right information in the application? For example: Product information etc.

21. How easy was it to search for information in the application? Could you think of any possible improvements regarding the search function?

**Service Excellence**

22. How did you experience the service quality in the application? Was it easy to get help from IKEA?

23. What was the service level if you compare it to the service in a physical store? For example, if you had any questions about the product.

24. How important do you think it is with provided service in an AR-application?

**Connectivity**

25. How could the connection to other customers enhance your experience with the application?

26. How helpful do you think it is to see product recommendations from other customers?

**Cognitive Experiential State (CES)**

*Description of Flow*

Flow is used to describe a state that is sometimes experienced by people who are deeply involved in an activity. One example of flow is when a person plays a video-game and is playing it exceptionally well and achieve a state of mind where nothing else matters but the game; he or she is completely and totally immersed in it. The experience is not exclusive to gamers; many people report this state of mind when they do sports, are engaged in hobbies, or working. It is an activity that captivate the person for some period of time. When a person experience flow, the time seems to stand still, and nothing else seems to matter. Flow has been described as an enjoyable experience (Novak, Hoffman, and Yung, 2000; Rose et al., 2012).

27. How did you experience *flow* when using the application?

28. How important is the overall flow to get a better experience when using the application?

**Affective Experiential State (AES)**

29. How did you feel when you used the application? For example, did you feel happy, annoyed, pleased etc. Please elaborate.

30. How did your feelings affect the experience with the application?

**Purchase Intention (PI)**

31. Did the application enhance the willingness to buy a product? If so, why? If not, why?

**General Questions**

32. What are the probability that you will use IKEA Place again?

33. Do you have any recommendation to improve the application experience? If so, what improvements?
## Interview Guide 2: Online (IKEA’s Website)

### General Questions

1. How old are you?
2. What is your current occupation?

### Skill

3. What kind of previous experience do you have with online shopping?
4. Have you used online websites for shopping purposes before you visited IKEA’s online store? If so, how did you experience it? If no, why haven’t you tried one?
5. How comfortable are you with your technology skills? For example with computers, mobile phones, games etc.
6. How did you experience IKEA’s website? Did your previous technology skills enhance the experience? If so, how? If not, why?

### Challenge

7. How challenging did you think IKEA’s website was? Did you feel that you had to use your capabilities to the maximum limit? If so, how? If not, why?
8. With regard of your previous experience with technology, how did the website test your skills?

### Telepresence

9. Did you feel that you entered a new world while using the website? For example forget your surroundings, and where you were? Please elaborate on this experience.
10. If you experienced this, did the real world come back when you stopped browsing on the website? Please elaborate. If you didn’t experience this, what limited you to not fall into this unreal world?

### Aesthetics

11. How important is the aesthetic feeling for you in an online shopping store? For example, the design of the website.
12. What was your first impression of the look and feel on IKEA’s website? Did something bothered you? If so, what?
13. How important is the aesthetics from a quality perspective?

### Ease-of-Use

14. How did you perceive the navigation of IKEA’s website?
15. How easy was it to use the website? Is it quick, easy, or difficult?
16. How long did it take for you to learn how it operated and how it was structured? How did this affect the use of it?

### Customisation

17. How well did the website fulfil your personal demands? Give an example. If the website did not fulfil your demands, what was missing?
18. How important is it that the website meet your demands? For example, remembering your previous shopping data, personal information etc?
19. Would you like to be able to customize the information on the website according to your own personal data?

### Ease-of-Information Access

20. How easy was it to find the right information on the website? For example: Product information etc.
21. How easy was it to search for information on the website? Could you think of any possible improvements regarding the search function?

### Service Excellence
22. How did you experience the service quality of the website? Was it easy to get help from IKEA?
23. What was the service level if you compare it to the service in a physical store? For example, if you had any questions about the product.
24. How important do you think it is with provided service when shopping online?

**Connectivity**

25. How could the connection to other customers enhance your experience on IKEA’s website?
26. How helpful do you think it is to see product recommendation from other customers?

**Cognitive Experiential State (CES)**

*Description of Flow*
Flow is used to describe a state that is sometimes experienced by people who are deeply involved in an activity. One example of flow is when a person plays a video-game and is playing it exceptionally well and achieve a state of mind where nothing else matters but the game; he or she is completely and totally immersed in it. The experience is not exclusive to gamers; many people report this state of mind when they do sports, are engaged in hobbies, or working. It is an activity that captivate the person for some period of time. When a person experience flow, the time seems to stand still, and nothing else seems to matter. Flow has been described as an enjoyable experience (Novak, Hoffman, and Yung, 2000; Rose et al., 2012).

27. How did you experience flow when using the website?
28. How important is the overall flow to get a better experience when using the website?

**Affective Experiential State (AES)**

29. How did you feel when you used the website? For example, did you feel happy, annoyed, pleased etc. Please elaborate.
30. How did your feelings affect the experience with the website?

**Purchase Intention (PI)**

31. Did the online store visit enhance the willingness to buy a product? If so, why? If not, why?

**General Questions**

32. What are the probability that you will use IKEA’s online store again?
33. Do you have any recommendations to improve the website experience? If so, what improvements?
Interview Guide 3: AR-Application and Online (IKEA Place and IKEA’s Website)

General Questions

1. How old are you?
2. What is your current occupation?

Skill

3. Do you have any previous experience with augmented reality and/or online shopping?
4. Have you used an AR-application for shopping purposes before IKEA Place? If so, what kind of application? How did you experience it? If no, why haven’t you tried one?
5. How comfortable are you with your technology skills? For example with computers, mobile phones, games etc.
6. How did you experience IKEA’s AR-application and IKEA’s website? Did your previous technology skills enhance the experience with the application and the website? If so, how? If not, why?

Challenge

7. How challenging do you think IKEA’s AR-application/website is? Did you feel that you had to use your capabilities to the maximum limit? If so, how? If not, why?
8. With regard of your previous experience with technology, how did the application and website test your skills?

Telepresence

9. Did you feel that you entered a new world while using the application/website? For example forget your surroundings, and where you were? Please elaborate on this experience and compare the experience between AR and Online.
10. If you experienced this, did the real world come back when you stopped using the app and/or website? Please elaborate. If you didn’t experience this, what limited you to not fall into this world?

Aesthetics

11. How important is the aesthetic feeling for you in an AR- application/on a website? For example, the virtual objects and the design of the application/website.
12. What was your first impression of the look and feel of the application/website? Did something bothered you? If so, what?
13. How important is the aesthetics from a quality perspective (application/website)?

Ease-of-Use

14. How did you perceive the navigation of IKEA Place and IKEA’s website?
15. How easy was it to use the application/website? Is it quick, easy, or difficult?
16. How long did it take for you to learn how it operated and how it was structured (application/website)? How did this affect the use of it?

Customisation

17. How well did the application/website fulfil your personal demands? Give an example. If the application/website did not fulfil your demands, what was missing?
18. How important is it that the application/website meet your demands? For example, remembering your previous shopping data?
19. Would you like to be able to customize the information in the application/website according to your own personal data?

Ease-of-Information Access
20. How easy was it to find the right information in the application/on the website? For example: Product information etc.
21. How easy was it to search for information in the application/website? Could you think of any possible improvements regarding the search function?

**Service Excellence**

22. How did you experience the service quality of the application and the website? Was it easy to get help from IKEA? (AR/Website)
23. What was the service level if you compare it to the service in a physical store? For example, if you had any questions about a product.
24. How important do you think it is with provided service in an AR-application/on a website?

**Connectivity**

25. How could the connection to other customers enhance your experience with the application/website?
26. How helpful do you think it is to see product recommendation from other customers (application/website)?

**Cognitive Experiential State (CES)**

*Description of Flow*
Flow is used to describe a state that is sometimes experienced by people who are deeply involved in an activity. One example of flow is when a person plays a video-game and is playing it exceptionally well and achieve a state of mind where nothing else matters but the game; he or she is completely and totally immersed in it. The experience is not exclusive to gamers; many people report this state of mind when they do sports, are engaged in hobbies, or working. It is an activity that captivates the person for some period of time. When a person experience flow, the time seems to stand still, and nothing else seems to matter. Flow has been described as an enjoyable experience (Novak, Hoffman, and Yung, 2000; Rose et al., 2012).

27. How did you experience flow when using the application/website?
28. How important is the overall flow to get a better experience while using the using the app/website?

**Affective Experiential State (AES)**

29. How did you feel when you used the application/website? For example, did you feel happy, annoyed, pleased etc. Please elaborate.
30. How did your feelings affect the experience with the application/website?

**Purchase Intention (PI)**

31. Did the application/website enhance the willingness to buy a product? If so, why? If not, why?
32. Did the application help your decision to buy a product online, for example a big furniture like a couch? If yes, why? If no, why not?

**General Questions**

33. What are the probability that you will use IKEA PLACE/IKEA’s website again? And for what purpose?
34. Do you have any recommendation to improve the application/website experience? If so, what improvements?
35. Did the application complement the website, and vice versa? If so, why? If not, why not?