

Utilizing Augmented Reality as a B2C Marketing Tool in the Furniture Retail Industry

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<p>This bachelor's thesis studies the utilization of augmented reality (AR) as a business to consumer marketing tool in the furniture and home accessory retail industry.</p> <p>The main purpose of this study is to be able to identify forms of augmented reality utilization currently used by market leading companies. In addition, another goal is examining the viewpoint of potential consumers to complement the company findings. The ultimate goal was to learn from the chosen companies and potential customers to be able to provide suggestions for companies in the industry that are not utilizing augmented reality yet.</p> <p>This research was conducted through mixed research methods. Both desktop research and qualitative interviews hosted after asking volunteer participants to try out IKEA's mobile AR application were employed. In addition, a quantitative questionnaire targeted at potential consumers was used to complement desktop research findings about market leading companies.</p> <p>The results of researching market leading companies were that there were two main ways of implementing augmented reality into consumer marketing, both of them through mobile applications. The first option was IKEA's way to have the AR experience as a main feature of the mobile application. The second option used by Amazon and Houzz was to have the AR experience as a side feature on their mobile applications.</p> <p>The results of interviews and questionnaire gave information about the awareness and opinions about AR as a technology option. In both respondent groups, there was interest towards the idea of applications of this kind. However, the application test users had issues with IKEA's mobile application in action, which diminished their interest towards it.</p> <p>As conclusion, furniture retail companies not yet utilizing AR as a marketing tool should focus on having a mobile application as a basis for implementing AR features. When implementing AR features, the focus should be on the quality of user experience to get the users to return to use the application or feature.</p>	
Keywords Augmented Reality, Benchmarking, IKEA Place	

Table of Contents

1	Introduction.....	1
1.1	Background.....	1
1.2	Research Question.....	2
1.3	Key Concepts.....	4
1.4	Demarcation.....	4
1.5	Benefits.....	5
2	Research Theory.....	6
2.1	Benchmarking.....	6
2.2	Customer Perception and Consumer Behaviour.....	7
2.3	Qualitative Interviews of AR Application Test Users to Gain Insight on Current AR Utilization.....	8
2.4	Quantitative Questionnaire for Capturing Consumers' Perception of AR.....	9
3	Research Methodology.....	11
3.1	Benchmarking Using Desktop Research.....	11
3.1.1	IKEA.....	11
3.1.2	Amazon.....	12
3.1.3	Houzz.....	14
3.2	IKEA Place Application Test User Interviews.....	15
3.3	Quantitative Questionnaire for Capturing Consumers' Perception of AR.....	16
4	Result Analysis.....	18
4.1	Analysis on Benchmarking.....	18
4.2	Interview Result Analysis.....	19
4.3	Questionnaire Analysis.....	21
5	Discussion.....	23
5.1	Key Findings.....	23
5.2	Development Suggestions.....	24
5.3	Validity and Reliability.....	24
5.4	Further Research Suggestions.....	25
5.5	Reflection on Learning.....	26
	References.....	28
	Attachments.....	31
	Attachment 1. Qualitative Interview Form.....	31
	Attachment 2. Interview Results.....	34
	Attachment 3. Quantitative Questionnaire Form and Results.....	39
	Attachment 4. Questionnaire results.....	42

1 Introduction

In this chapter the thesis topic is introduced through background as well as the chosen research question and sub-questions chosen for this study. This chapter also explains the demarcation, expected benefits and finally key concepts of the thesis. This chapter's goal to explain and introduce the thesis and give an idea for the reader of what are the topics in the next chapters.

1.1 Background

After researching current and future trends in the area of marketing there was one intriguing trend, which was the emerging of augmented reality (AR) and its utilisation in marketing of products to consumers. Considering this further, according to estimation augmented reality's worldwide market is going to increase from 2017's slightly under 3.5 billion U.S dollars to almost 200 billion U.S dollars by 2025. (Statista 2019a.) In addition to this estimation, there are already multiple companies which have started to utilize augmented reality in their marketing efforts towards consumers.

One example of a company already using AR, in this case in the furniture and home accessory retail industry is IKEA. IKEA has its own free AR application downloadable for smart devices, that lets the user place IKEA products into their homes by using the smartphone's camera . This way the user can look around and place object into the chosen positions and see how they look. (IKEA 2017.)

Taking the earlier mentioned growth estimation and company example into consideration, this thesis digs deeper into the realm of AR as a marketing tool option. The focus will be on the furniture and home accessory retail industry, where certain companies like IKEA have already implemented AR content into their marketing efforts, thus making it a viable industry to examine closer. In addition, this thesis involves taking a look to the awareness of potential customers of furniture and home accessory retail companies in Finland. This is conducted to gain insight of their knowledge and interest towards this kind of technology. Through these research efforts the goal is to be able to help companies in the furniture and retail industry who have not yet utilized AR technology in their marketing efforts.

1.2 Research Question

The main objective of this thesis is to find solutions for furniture and home accessory retail companies who are not yet using AR as a marketing tool in their B2C marketing efforts. The objective is that the thesis would prove beneficial to companies interested in implementing AR as part of their B2C marketing efforts, and to build the knowledge about the utilization of AR as a marketing tool. Therefore, the research question (RQ) of this thesis will be: **RQ: How Can Furniture Retail Companies Use Augmented Reality as a B2C Marketing Tool?** Investigative questions (IQ) will be as follows:

IQ 1. How do market leading companies in furniture retail use augmented reality (AR) in B2C marketing?

IQ 2. How do potential B2C customers view marketing with AR?

IQ 3. How could a furniture retail company utilize AR the best in their B2C marketing efforts?

Table 1 below presents the theoretical framework, research methods and intended results chapters for each investigative question in an overlay matrix.

Table 1. Overlay matrix

Investigative question	Knowledge base	Research Methods	Results (intended chapter)
IQ 1. How do market leading companies in furniture retail use AR in B2C marketing?	Trusted literature, Company websites, Web search	Desktop research, AR application testing with semi structured Interviews	4
IQ 2. How do potential B2C customers view marketing with AR?	Planned AR application testing with potential customers followed by a semi-structured interview. Carefully planned questionnaire to target potential customers.	AR application testing with semi-structured Interviews, Survey/Questionnaire	4
IQ 3. How could a furniture retail company utilize AR effectively in their B2C marketing efforts?	Questionnaire data, interview results, benchmark results analysis	Desktop research, Data analysis	4

1.3 Key Concepts

Augmented reality means pictures which are created by computers and they are visible in together with the real world. For example, through a camera of smart phones or tablets. (Cambridge Dictionary 2019.)

B2C marketing means marketing efforts which are targeting consumers who are making decisions on which products and services to buy and use. (Dacko 2008, 121.)

Benchmarking is a process that involves comparison of organizations and their performance, processes and practices. More specifically comparing the organizations who are market leaders and can be considered to have the best practises. The aim of the comparison is to find out how to improve the organization´s processes and performance by identifying what the market leading organizations are doing. (Dacko 2008, 52.)

Customer perception is a business concept which means the customer´s view, impression and awareness of a certain company and its products. Affecting factors of customer perception are how the companies promote and bring forward their products and the companies itself. (Business Dictionary 2019.)

Consumer Behavior means a person´s own decision-making process that leads to choosing to buy or not to buy certain product or service through evaluating one´s needs and options. (Khan 2006, 4.)

Mixed methods research is a type of multiple method research design that has both qualitative and quantitative research, meaning that the research will include both types of research to provide answers to researched topic. (Saunders 2016, 169-170.)

1.4 Demarcation

This thesis is limited to augmented reality technology´s utilization as a marketing tool option. Therefore, it will not concern virtual reality or other relatable emerging technology solutions. The reason for this is to keep the thesis topic narrow enough. In addition, the scope is to research how companies in furniture and home accessory retail industry are utilizing AR in their marketing efforts. This as mentioned earlier, narrows the thesis to mainly address the chosen industry and focus on aiding furniture retail companies in Finland and by studying companies like IKEA and their take on utilizing AR content. By sticking to these limitations, the thesis is prevented from becoming too broad.

1.5 Benefits

The expected benefits of this thesis would be in the ideal situation that the thesis would be able to offer insight for furniture and home accessory retail companies in Finland, on how to apply and utilize AR in B2C marketing, and what do potential customers in Finland think about the technology. This would benefit companies interested on applying AR so that they would be able to utilize this form of technology in their marketing in such manner that it would appeal to potential customers. Personal benefits include building knowledge about augmented reality and its utilization as a marketing tool, which can be beneficial for future career options. Especially, if the augmented reality market will continue growing. Other benefits will include gaining more insight on how the potential customers of the furniture and home accessories retail industry welcome this technology option in Finland.

2 Research Theory

This chapter looks closer the theoretical framework for this thesis. The goal is to provide clarity on the kind of theory basis the different research methods used to conduct this thesis have. This chapter is divided into four subchapters which tackle one of the main research points each. The goal is to explain through theory, why these certain key aspects and research methods are used in conducting this research.

2.1 Benchmarking

This subchapter takes a look into the concept of benchmarking, the theory behind the concept and its suitability to be used in this study. First and foremost, it is important to define benchmarking.

Benchmarking can be seen as a process where a company or an organization recognizes what needs to be done to be successful, has an understanding of its processes, and improve its performance by learning from other companies and organizations who handle their processes better than them (Tuominen 2016, 30). Thus, benchmarking can be seen as learning from companies who are already utilizing something your company has not, or does it better than your company, but at the same time maintaining a clear understanding of your own processes.

Finding potential companies to benchmark can be divided into four different parts, internal, competitive, industry and generic benchmarking. Internal benchmarking means learning about your own company's processes by learning from different parts of your company and by studying them better the whole company's processes. Competitive benchmarking refers to learning from your closest competitors and their processes. Industry benchmarking takes a look into companies in the industry who are not your direct competitors and learning from their efforts. Generic benchmarking then again means learning from outside the industry to gain better results and/or practices. (Tuominen 2016, 54-61.)

In this thesis the main benchmarking styles used were competitive and industry benchmarking. These were selected in the aim to learn how the direct competitors of furniture and home accessory retail companies in Finland do better regarding to AR content in marketing for consumers. As well as how foreign companies of the same industry are utilizing AR. Even though AR is a relatively recent technology option, there are already companies utilizing AR in the furniture retail industry. Therefore, there is definitely room for learning from companies who have already implemented AR into their marketing efforts. Especially looking into the Finnish market, IKEA will be the main company examined closer due to its large presence. In addition, IKEA was selected due to the fact it has its own AR application called IKEA Place, which lets the users place IKEA products into the user's own home by using the smart device's camera (IKEA 2017). There are also other companies in the industry who already have their own AR features for example, Houzz and Amazon with their AR features (Marxent 2019).

2.2 Customer Perception and Consumer Behaviour

Customer perception is a business term which means the kind of feelings and knowledge the customer has towards a business and its products or services. This is affected by advertising and marketing efforts from multiple channels and the company's public image as well as customer's own experiences with the company. (Business Dictionary 2019.) In this thesis one of the main goals is to gain insight on what potential customers or consumers for furniture and home accessory retail companies think about AR content and applications utilizing it. The potential customers in this thesis will be defined to be over 18-year-old people living in Finland by the author, since the research is mainly focusing on providing help for Finnish furniture retail companies. This is due to not finding evidence that they have similar AR applications or features as the benchmarked companies. Therefore, it was essential to set up research methods which helped to gather information about Finnish consumers.

When looking into potential customers' decision making and how they react to information, according to Khan (2006, 88-89) the main affecting factors are exposure, attention, interpretation and memory which together with the person's own perception lead the people on making decisions to buy or not to buy products. Considering this for AR utilization in marketing efforts, it is important to learn what kind of ways do the benchmarked companies have to expose their potential customers to their products by using AR, and this way gain their attention.

Consumer behavior in itself is a larger concept with broader range of affecting factors. One of the affecting factors are emotions. Consumers' emotions can play a significant part when making purchase decisions so therefore this is something that needs to be paid attention to when companies are planning their marketing to consumers. One way for companies to effect these emotions is through innovative advertising. (Khan 2006, 99.)

In this thesis gaining insight on the kind of emotions and feelings the applications with AR content raise for the potential customers of furniture and home accessories retailers is being looked into closer. This was carried out by using interviews and a targeted questionnaire. It is important to learn what kind of aspects in marketing efforts utilizing AR bring forward the positive emotions to be able to recommend what kind of aspects should companies pay attention to.

2.3 Qualitative Interviews of AR Application Test Users to Gain Insight on Current AR Utilization

To complement the findings of desktop research about current AR utilization in the furniture and home accessories retail industry, the author decided to conduct a series of qualitative interviews with chosen test participants of an AR application. This was done in order to gain deeper insight on the current AR utilization of market leading companies of the industry, in this case IKEA.

The chosen application for the testing was IKEA's IKEA Place application. The reason for choosing this particular application was that it seemed the most relevant since IKEA is a player in the Finnish furniture retail market. After instructing and letting the participants test the application, the next step was to host semi-structured interviews with the participants. The goal was to gain insight on how the participants felt about the application, what were the application's strengths and what the participants felt the application could do better. In addition, the aim was to gain insight on what aspects should the companies in the industry Finnish or foreign who currently lack AR content take into consideration when planning on implementing AR features or applications.

The advantage for choosing semi-structured interview as the type of interview was that it fit well into the nature of this thesis. The semi-structured interviews allow the interviewer to have a set of key questions, but still have an option to discuss topics further if needed (Saunders 2016, 391). Due to this, the questions used in the interview were primarily open-ended. Open-ended questions were chosen because they are viable to be used in situations where the interviewer cannot or should not predict the answers of the respondents (Brace 2008, 52.). This fit well into the purpose of these interviews. It would have not been beneficial or reliable for the interviewer to assume how the participants feel about using the AR application. Therefore, by using open-ended questions in semi-structured interviews the goal was to get the most accurate understanding of how the participants felt about the IKEA Place application.

The target participant amount chosen for this research was 8-10 participants, who were adults over the age of 18 years currently living in Finland. The reason for this selection was to gain further insight, about how these participants feel about using an available application which utilises AR technology. The goal was to dig deeper on to what kind of aspects should a successful AR application have, to raise interest of potential customers towards the company's offerings. In addition, through this kind of research could help determine the aspects of the tested application should be improved.

2.4 Quantitative Questionnaire for Capturing Consumers' Perception of AR

Quantitative research has an aim to collect data from a broader number of respondents in a standardized manner by getting participants to answer pre-formulated questions with possibly pre-set answer options (McGivern 2013, 189-190). In this research thesis the quantitative research part was performed with a rather brief quantitative questionnaire.

The questionnaire consisted of questions which aimed to track how aware of AR applications and AR technology the respondents were. In addition, there were questions regarding the respondents' preference on how they would like to encounter AR technology if at all. Since the questionnaire's aim was to gather respondents' opinions the questionnaire used Likert-style questions. The reason for this was that they give respondents options on how powerfully they feel to either agree or disagree with the questions. (Saunders 2016, 457.) As mentioned, the idea of using this type of questions was to gain insight on the respondents' opinions and awareness about the topic at hand thus making these kinds of questions suitable.

The Likert-style questions in this questionnaire used a balanced scale, where the idea is that the respondents have as many positive and negative answer choices to choose the most fitting one from. This way the questionnaire questions are not tipped onto neither positive or negative side to avoid the possibility that the answer options would lead the respondents more towards either positive or negative answers. (Brace 2008, 67-69.)

This questionnaire did not offer the respondents a totally neutral opinion to prompt respondents to bring out their feelings and opinions more. Leaving the totally neutral option out was in this case also to ensure that the respondents would pay attention to the questionnaire and not skip questions by choosing the neutral option. In addition, regarding to the nature of the questions, the author did not see a clear need for a neutral option. The targeted respondents for the questionnaire were adults over the age of 18 years who live in Finland. The questionnaire's ultimate aim was to gain insight on how aware of the AR content and applications utilizing AR the respondents are. In addition, the author used IKEA Place application as an example to describe to the respondents the type of AR applications that are currently available for use. This was done to gain insight on the respondents' interest on a mobile application which visualizes furniture and home accessories. In addition, using IKEA Place application as an example, and asking questions about respondents about their feelings towards the application aimed to support the desktop research of IKEA's AR practices.

3 Research Methodology

This chapter focuses on the methodology used to conduct this research. The chapter is divided into three subchapters which address following topics. Benchmarking using desktop research focusing on the businesses benchmarked for their AR utilisation, testing of the IKEA Place application and the semi-structured interviews following the testing. In addition, the quantitative questionnaire designed to capture insight on the respondents' awareness and opinions on AR technology is further looked into in this chapter.

3.1 Benchmarking Using Desktop Research

This subchapter addresses the benchmarking of companies in the furniture and home accessories retail industry who already utilize AR as a part of their marketing. The main objective of this subchapter is to answer the first investigative question, how do market leading companies in furniture retail utilise AR?

The benchmarking was conducted by using available information on the company websites as well as the information from the application downloading platforms like Google Play. Later on, in the thesis, the results of the benchmarking of IKEA specifically are compared with the results of the IKEA Place application test user interviews and the quantitative questionnaire. Through the comparison, the aim is to gain a clearer picture of the available AR features and the opinions and feelings of potential customers in Finland.

3.1.1 IKEA

IKEA is a giant multinational furniture and home decoration retail business originating from Sweden (IKEA 2019). IKEA is the main benchmarked company of this thesis due to its large presence in Finland. In 2018 IKEA was by far the largest retailer in Finland by turnover of approximately 334 million euros. Comparing the turnover to the second largest retailer Finnish Indoor group which is the mother company for both Asko and Sotka stores. They only had a turnover of 187 million euros. (Statista 2019c.) This large difference shown further solidifies why IKEA is a very prominent company to be examined closer about their AR implementation.

In the retrospect of AR utilisation, IKEA has an application called IKEA Place. The application utilises the user's smart device camera to create images of IKEA's products into the smart device's screen when looking around the room with the smart device camera (IKEA 2017). The application is available, and it can be downloaded on both android and IOS (Apple) devices. The application was first available for only IOS devices but was later made available for android users as well. For Android it requires the user to download Google's AR Core services to enable it to work on Android devices. The application has a large catalogue of IKEA's products and a search option for finding wanted products. The catalogue shows accurate product descriptions of IKEA's products. In addition, the application has a scanning feature where the user can scan a piece of furniture in their own room and the application shows the equivalents of the furniture from the application's catalogue. (Inter IKEA Group 2018.)

One thing that makes IKEA Place a bit uneven for different users is that it currently has more features for their IOS version than their Android equivalent. IKEA Place for the IOS devices has a possibility to go through a set of ready-made room decoration options. This feature, however, is currently missing from the version for Android application which only had the same item scanning and placing catalogue items into the room features. This feature is fairly new, and it arrived in the application via update in late September, and according the update is also planned to happen for Android devices later on. (Inter IKEA Group 2019.)

Considering promotion to potential customers, IKEA has an advertising video for the IKEA Place application, and it has received approximately 300 300 viewing times on YouTube (2019c). This way IKEA has not only launched the AR application to showcase their products to potential customers, but in addition promoted the tool for promoting their products. Looking at their application's download success, only approximate direction giving numbers were available and only for Android. According to Google Play (2019c) the application had been downloaded over 100 000 times.

3.1.2 Amazon

Amazon is much more than only furniture and home accessories retail business, but one of the world's leading retail companies in general. By brand value Amazon is the most

valuable company with the brand value of approximately 315,5 billion U.S dollars (Statista 2019b). The reason Amazon is one of the market leading companies benchmarked in this research is their Amazon AR view. Amazon AR view differs from IKEA's application, since Amazon's AR view is not a stand-alone application or a main feature, but a more of a side feature on Amazon Shopping application. (Amazon 2019.)

The idea, however, is very similar. Amazon AR view utilises the smart device's camera to create the objects on to the camera view the similar way the IKEA Place application does. When going through application's catalogue some of the furniture and other items have a feature called View in my room. The user can then select the feature to see how the chosen object looks in their room. By choosing this feature, and pointing the smart device camera to the room, it is possible to place the product into wanted spot and see how it would look or fit. (Amazon 2019.)

The Amazon Shopping application can be found for both Android and IOS devices. Similarly to IKEA Place the Amazon's AR View feature for the Android users requires to also download Google's AR Core services to enable it to work. Amazon Shopping application also has the possibility to search items by scanning them with the smart device camera the same way as IKEA Place application's feature. (Amazon 2019.)

The biggest difference comparing to IKEA Place is that the AR feature is more of a side feature rather than a main feature of the application. The applications do have many similar features as above mentioned, but the Amazon Shopping application is not pushing the AR feature as strongly as IKEA Place.

Like IKEA, Amazon has also its own advertising video of their AR feature, but with an enormous difference in viewing amounts. Amazon's video has generated approximately 96 693 000 views on YouTube (2019b). A number by far larger than IKEA's video with views in hundreds of thousands. Considering download amounts for Amazon Shopping application, according to Google Play (2019a) the application has been downloaded more

than 100 million times for Android devices which is a whopping amount. In this case however, the number of downloads does not correlate as directly to the exposure of the AR feature for the users, since the feature is not the application's main purpose.

3.1.3 Houzz

Houzz is a platform for designers, renovation specialists, home designers and consumers which gives them all an ability to either showcase their offerings, find design ideas or furniture and other home accessories for their homes. Houzz is a U.S based company which has expanded to multiple other countries and has nowadays over 40 million users in different countries. (Houzz 2019a.)

Houzz has their own mobile application called Houzz Home Design & Remodel which is available for both Android and IOS users alike. When it comes to AR, Houzz has similar approach to Amazon. They do not have a separate application for the AR, but rather have it as a side feature as part of their mobile application. The idea is similar to Amazon AR view concerning not having a separate application like IKEA. (Houzz 2019b.)

The AR feature of Houzz's application resembles Amazon AR view and IKEA Place quite a lot. The working idea is similar. The user can find furniture and home accessories from the application's catalogue and in selected cases view them in their room if the user so desires. The feature utilises the smart device's camera to place the products into the camera view similarly to the other applications. Major difference to the other benchmarked companies is that Houzz's AR features are not limited only to furniture and other home accessory objects. The feature allows a possibility to also try out different floor options, for example different kind of panels and other floor materials by placing the material over the chosen pinpointed floor area. (Houzz 2019b.)

Regarding their AR feature's promotion by video material comparing to IKEA and Amazon, Houzz too has its own introductory video. The video has not gathered as much attention than the others with only slightly over 35 thousand views on YouTube (2019a). The amount is significantly lower even when comparing it to IKEA's video. However, the number of download times of their application for Android devices according to Google Play (2019b) has reached over 10 million. In this case, as well as with Amazon's

application the amount of the users using the AR feature is difficult to tell since it is not the main feature of the application.

3.2 IKEA Place Application Test User Interviews

To gain a deeper insight on how the IKEA Place application works in practise, the potential customer's awareness and opinions of the application, and to have comparison with the quantitative questionnaire results, a series of interviews were held with selected volunteer test users of IKEA Place application.

The ultimate goal of these interviews with chosen test users was to gain insightful information on the kind of feelings and opinions arises from the participants after testing the application. Discussing the strong points of the application and which attributes of the application should be enhanced. Only relying on the information found by doing desktop research would not be as viable when trying to find answers for the above-mentioned aspects.

The testing and follow-up interviews were conducted with the total of 8 participants. The requirements set for choosing the respondents were that their age was over 18 years and living in Finland. The respondents were chosen by the interviewer by asking their consent to be a part of a bachelor's thesis research verbally. The interviewer explained that the interviewer does not publish any detailed personal data of the participants and only asks the participant's first name and age for the interviewer to differentiate participants while doing the interview process. Even these details were not mandatory, if the participant would have not wanted to give out this information. Thus, the only information provided about the participants is a rough scale of the age group of the participants to avoid publishing details that could lead to recognition.

The respondents were given instructions to download the Ikea Place application, and if needed, the Google's AR Core to enable the application to work for Android devices. The reason for asking the respondents to download the application to their own devices was that they would receive starter guidance when opening the application, the first time. The application does not require signing up, so the respondents did not have to use time to make an account if they did not wish to do so.

The participants were given instructions to test the application freely from approximately 30 minutes to an hour and a half on their free time. After testing the application for a sufficient time, the participants were asked to notify the interviewer so the interviews could be scheduled. This time span of testing time was determined around the interviewer's personal estimation of how much time a participant would need to be able to answer the interview questions and gain needed insight on what the application was about and how it worked. The interviewer did not give detailed advice or comments to the participants about how to use the application to ensure as pure results possible.

The interviews were held on four different occasions between the dates of 20.10.2019 and 26.10.2019 which were decided together with the participants. During the interviews participants were asked to answer the interviewer's pre-made questions individually. The two first questions were to determine the respondents' prior knowledge about the IKEA Place application with simple yes/no questions. Next, the respondents were asked to answer a series of open questions concerning the application's layout, user-friendliness, and the application's strengths and points of improvements.

After these questions, the latter questions were about the respondents' evaluation of the application's helpfulness in making purchase decisions of furniture and home accessories, and their opinion on would they use the application again and for what reasons. Finally, the respondents were given a chance to give open feedback by writing about the testing and the interview, but this was purely optional. The interviewer recorded the answers of the participants by taking notes into pre-made Google Forms documents. This method was chosen because it made it convenient for the interviewer to store the answers and gather them together.

3.3 Quantitative Questionnaire for Capturing Consumers' Perception of AR

To get broader insight on the awareness and opinions of the potential customers towards augmented reality and applications utilizing it. To gain this insight the author formulated a quantitative survey to target people who were over the age of 18 years living in Finland.

The questionnaire was made by using Google Forms. The reason for selecting Google forms as the questionnaire platform was that Google Forms allows the user to easily

adjust and share the created questionnaire. In addition, with Google Forms collecting the answer data together and monitoring the questionnaire was convenient. The importance of monitoring was learned rather quickly, since the survey had a slight flaw at launch which was brought into knowledge by one of the early respondents. The flaw enabled respondents to choose more than one option where it should not have been the case. However, this was fixed and checked that it had no effects on the already received data.

The questionnaire itself consisted of three main sections. The first section asked for the respondents age group, which was divided to 10-year groups with the exception of the first under 21-year-old group, and the last over 60-year-old group. The second section of the questions were testing the general knowledge of the respondents concerning augmented reality. The third main section first introduced IKEA Place application slightly more in detail, and the questions following the intro were testing respondents' interest in trying this kind of application and would they see the ability to visualize the items helpful for making purchase decisions.

Finally, the respondents were given a possibility to give out free feedback concerning the survey. This part, however, was totally optional. The Survey used the total of four different answer choice options per question in the two latter main sections. The answer choices were limited to this amount to keep the answering simple for the respondents and keep the survey short enough to maintain their focus.

4 Result Analysis

This chapter takes a closer delve into the results of used research methods. By desktop research analysis as well as analysis of the results from the interviews and the quantitative questionnaire. This chapter's aim is to provide answers to the first two investigative questions in other words share a deeper insight on how the benchmarked companies utilize AR and what could companies in the Finnish furniture and home accessory market who are not utilizing AR learn from them. In addition, the level of AR awareness and attitude towards the AR applications from both the interview participants and the questionnaire respondents are evaluated through received results.

4.1 Analysis on Benchmarking

By doing desktop research about IKEA, Amazon and Houzz it was noticeable that all these companies have made AR features a prominent option for showcasing their products. However, the information was almost solely relying on the company website and the download platform information. Without having the possibility to access deeper numbers on how successful these AR features have been it can be said that the information was fairly scarce.

The benchmarked companies were having two main ways of utilising AR in their marketing with IKEA having their separate IKEA Place application where the AR experience was a main feature, and Amazon and Houzz using AR as a side feature for their applications. Concerning approximate download amounts from the Google Play platform, by having the AR as a side feature in the company's main application reached more audience, but then again there can be no certainty on how often these users actually have tried the AR feature in Amazon's or Houzz's applications. IKEA's application had far lower download amount comparing, but then again, the Android users who downloaded the application were at far larger exposure to the AR features.

In addition, considering customer awareness, the promoting of the AR features has caught an enormous audience by Amazon. Reasons for this can be that Amazon has put more funding into their promotion than Ikea or Houzz and this way get its advertising video far more widely visible for the audience. In any case, getting widespread visibility is important when trying to catch potential customers' attention and at least by this aspect Amazon has done very well. In addition, marketing-wise it was very interesting to see how the companies have promoted their promotional tools for the audience to gain more awareness of their offerings.

Further looking into these aspects on furniture and home accessory retail companies without AR implementations. It can be a far-fetched aspect on thinking of having AR feature implementations before having a solid mobile application for a basis. However, as technology is developing, and AR usage in business and marketing is growing this can be something these companies should take into consideration while planning on possibly releasing mobile applications in the future.

4.2 Interview Result Analysis

The Interviews gave multiple interesting insights on how the participants felt about the application and what were its strong points and weaknesses. The participants' ages were in the range between 20 and 55 years. The detailed ages or names of the participants are not be published in this thesis to protect the participants' anonymity. The results discussed in the next paragraphs refer to the Attachment 2 interview results.

The participants were asked first asked about their familiarity of the application prior to the testing and have they used the application prior to the testing. The results were that a quarter of the participants had heard about the application prior, but none of the participants had tried the application prior to the testing. Thus, it can be stated that the general awareness of the IKEA Place application prior to the testing was fairly low and the prior user experience was none-existent. Of course, the fact that the participant sample was small can affect this statement, but nevertheless it was fairly surprising that the awareness of the application was this low.

When asking about the layout of the application, the participants were mostly agreeing that the general layout was fairly clear and some of the participants pointed out that the catalogue of products was clear. Then again, moving on to asking about the user-friendliness of the application, all of the participants were like-minded that there were issues. The stand-out issues were the usage of the AR feature to place the objects into the room. According to most of the participants the problems were that moving and scaling the objects was hard and the application did not run smoothly while doing this. Good comments were received on the catalogue and the starting chat which introduces the application. Therefore, taking these comments into account it can be stated that the application had issues with its user-friendliness among the participants.

Moving onto the strong points of the application, according to the participants the application's idea of utilizing AR was something that they liked. Also, the catalogue and the scanning feature to find products from the catalogue were something that the application did well according to the participants. Concerning these answers, the fact that the AR itself in use received very little praise is quite alarming since it is the main feature of the application. This is definitely something to think about since the AR experience in this particular application should be the strength of the application.

Going through the answers of what would need to be improved, the participants were quite unanimous on making the AR experience better. The participants had had the most trouble with placing the furniture and also getting them to be shown in a right size and in the correct angles. Other points of improvement revolved around the general user-friendliness and the application not running desirably. Considering these answers, IKEA should put more emphasis on making the application's AR experience more streamlined and user-friendly. Therefore, the importance of user-friendliness is very important aspect to be considered as well by companies thinking of implementing AR features in the future.

When asking about the helpfulness of the application in planning for furniture and home accessories acquisitions the participants' answers were a bit divided. Some participants saw the application helpful for shopping design items and getting a visual presentation of what the products would look like, at least approximately. Others then again, did not see the application helpful at its current state because of the earlier mentioned issues. Thinking these answers further and comparing it to what the participants were mentioning in earlier questions showed that the idea of the application is intriguing. Therefore, based on these answers, this kind of AR solution clearly has potential if the application or feature would just work in a desirable way.

As the last question on participants' interest to return to this application and the reasons behind their decision, roughly three quarters of the participants would not use the application again at least not in its current state. However, some of the participants who were not going back to the application were still on the mindset that if the application would be enhanced, they could possibly return to the application. The main reasons for the participants who would return to the application were in a nutshell the possibility to check up on certain items on their looks.

Looking further to the answers, the participants did not find the application enjoyable or helpful in most occasions due to the application being difficult to use. This then again means that the application is not providing what it promises too well. Matching the users' expectations and getting the user experience onto a desirable level is something that IKEA as well as furniture retail companies not yet utilising AR have to take into consideration. Otherwise the users might not return to the application thus weakening the purpose of having one.

4.3 Questionnaire Analysis

The quantitative questionnaire concerning potential furniture retail customers' awareness and opinions regarding to AR technology was released in mid-October 2019 and it remained open until the end of October 2019. During this time span the questionnaire received a total of 43 responses. The questionnaire was shared to approximately 300 potential respondents, so the response rate was under 15% which was lower than expected.

The number of responses was slightly lower than the estimated target limit of at 50-100 responses. Therefore, as the answer amount received was low it does put stress on the viability of the analysis. However, the responses still give some outline of potential customers' current state of awareness and attitude towards AR technology and applications utilising it.

Thus, analysing the answers concerning the respondents age group in this case had to be seized due to the generally small amount of responses and by the fact that most of the different age group sets did not receive enough responses for viable analysis. Therefore, the response results will be analysed as a whole disregarding the respondents age. The numbers presented in the analysis refer to figures found on Attachment 4.

By the responses received concerning familiarity with AR content, more than half of the respondents were slightly familiar (44,2%) or not familiar at all (14%) with AR content in general. Then again asking about familiarity about applications utilising AR the amount of slightly familiar respondents grew larger (51,2%) and the respondents who were not familiar at all grew as well (16.3%). Considering these numbers more than a half out of the 43 respondents had at best a low level of familiarity regarding to AR content and applications utilizing AR technology.

Moving on to analysing the respondents' interest towards trying an application utilising augmented reality majority of the respondents were fairly interested or very interested on trying AR applications and only very few respondents were not interested at all. Considering this it can be said that majority of the respondents had interest towards AR applications. Comparing these results to the general awareness, even though the awareness level of the respondents was not that high majority of the respondents were still keen on getting to try this kind of technology option.

Moreover, after providing a short description of the IKEA Place application, over three quarters of the respondents were either fairly or very interested to try the application. Considering this information in together with the interview results where participants were mentioning about the application's idea being good, it seems that both respondent groups were intrigued by the idea of the application. This was further enhanced by the fact that almost all of the respondents of the questionnaire were either agreeing or strongly agreeing that being able to visualize products has effect on making purchase decisions. Considering this further, the idea of being able to visualize products and interest in trying this type of AR application interested the respondents.

Finally, looking back at the quantitative questionnaire results it can be stated that the level of current awareness of AR technology and applications utilising it was on a low level for over half of the respondents, but interest in the topic and trying applications like IKEA Place application was quite high among the respondents. However, it has to be stated that this information gained from the quantitative analysis is not fully viable since the amount of respondents was low and the age spread of the respondents was not as wide as hoped.

5 Discussion

In this chapter the key findings of this thesis are presented in together with found developments suggestions and thoughts on further research. In addition, this chapter takes a look into the reliability and validity of this thesis and finally, evaluation of the author's own learning and the thesis process as a whole.

5.1 Key Findings

In this thesis key findings were that there are currently two main ways of AR utilisation used by the benchmarked companies IKEA, Amazon and Houzz. IKEA has a dedicated application for its AR implementation called the IKEA Place which has the AR experience as its main feature. Amazon and Houzz have taken a slightly different approach by having the AR feature as a side element to their mobile applications. All of these companies have made their applications are downloadable for both Android and IOS devices and they are free. These companies have also promoted their AR features by using videos in order to reach consumers about their AR features.

Interviews with the IKEA Place application testing participants revealed that the application in its current form is not desirable due to multiple issues with the main AR feature of placing the products into one's room. The flaws affected the participants' user experience negatively thus making majority of the participants conclude that they would not return to the application at its current condition. However, multiple participants felt that the application's idea was rather good. Therefore, thinking this from a consumer behavioural view it is important that when trying to promote one's products with this kind of tool, the execution should be very close to the level of the users' expectations. Otherwise, like in this case, the users won't necessarily return to the application thus weakening its the purpose as a promotional tool.

Considering the quantitative research in this thesis the findings have to be handled with criticism since the overall amount of the respondents was lower than expected, thus negating the age group aspect and hindering the overall viability. The key findings from the questionnaire were that the overall awareness of the respondents considering AR technology and applications was more on the lower level, but the interest towards these kinds of applications was present. In addition, the vast majority of the respondents were agreeable that being able to visualize products does have an effect on making purchase decisions.

5.2 Development Suggestions

Companies in the furniture retail industry who have not yet utilised AR in their marketing should carefully evaluate of their capabilities to match the current AR features available. IKEA's method of having a dedicated application for the AR features did not collect as much downloads than having the AR as a side feature for the applications, but then again, this option pushes the AR experience stronger for the users. Another point to be considered is that the execution of the AR features. This should be as polished as possible to get potential customers to return to the application after trying it thus proving to be viable tool. Otherwise, the potential customers might shun the application because it did not meet their expectations like in this research among the test users.

For companies not yet utilizing AR in the furniture retail industry, the first step would be to look into having mobile application presence. Based on the actions of the benchmarked companies they all have utilized AR through mobile applications. Therefore, furniture retail companies who currently lack mobile applications for their products should first look into having the AR implementation through mobile application. However, they should pay attention to having the application easy to use for the consumers that there would be reason for them to use it.

Something for IKEA to develop considering the responses from the interviews of the test participants, IKEA should focus on enhancing their application to be more user-friendly and streamlined. This would help keep the users interested of the application and make them return to it.

5.3 Validity and Reliability

Both the validity and reliability of this thesis research could have been on a higher level due to multiple reasons. The mixed method research chosen for this thesis did not work as desirably as expected leaving the results of the quantitative questionnaire slim due to low level of answers. This was probably due to not effective enough distribution and promotion of the questionnaire. In addition, relying on heavily on scarce desktop research information further hindered the reliability of this work.

In addition, by doing the desktop research the found information was mostly based on what was found from the benchmarked companies' websites and approximate statistics found from download platform Google Play. Furthermore, the numbers provided by Google Play were only direction giving. However, the benchmarking of IKEA's, Amazon's and Houzz's practices still offered some basis of their current actions and insight on what kind of promoting they have done in order to catch the consumers eyes.

Considering the reliability of the interviews of the test users, it can be said that it was on a fairly high level. Especially, since the participants did not have strong prior knowledge or user history of the IKEA Place application. This aspect lowered the possibility of the respondents having strong prejudice or precaution towards the application. Considering validity, the chosen participants were from the chosen examined which was the over 18-year-old personnel living in Finland in both qualitative and quantitative research. The chosen application used was from the main benchmarked company of this research since IKEA is a one of the market leaders in the furniture retail in Finland. Considering these facts, the selection of the targeted population for testing the AR application and the questionnaire was justified.

The quantitative questionnaire then again, had issues with its viability due to a low response rate as mentioned in the analysis section. This could have possibly been avoided by enhanced promotion of the survey, and consider having the language of the survey to be Finnish instead of English since the target population was personnel living in Finland.

All in all, this thesis has lacks on both viability and reliability due to above mentioned issues and therefore the results especially from the quantitative questionnaire have to be handled with a fair amount of criticism.

5.4 Further Research Suggestions

For further research, it would be beneficial to perform a larger scale, and more in dept questionnaire about consumer awareness and attitudes towards AR technology to even further map out the level of awareness and opinions towards augmented reality content and applications. Comparing to this quantitative questionnaire the amount of responses should be far larger to be able to also pinpoint effects of age on the awareness and opinions.

In addition, for companies in the furniture and home accessories retail industry who have not yet utilised AR in their marketing efforts towards the consumers, research delving deeper into the kind of requirements there are to be able to set up mobile applications which implement AR features would be beneficial. Furthermore, a deeper investigation of possibilities outside of mobile applications could prove beneficial as well.

5.5 Reflection on Learning

Reflecting my own learning during this thesis process, I feel that I have gained quite a lot on how AR as a technology option considering promoting products has been utilised. During the thesis process I got to develop my personal knowledge about AR technology utilisation in marketing, especially in the form of mobile applications. I have also learned the difficulties of gathering viable information to be able to produce concrete answers to self-set questions. Also, using the mixed research approach was not the best choice for this thesis. Better results could have been reached by solely focusing on either qualitative or quantitative research. By doing both in a rather short amount of time hurt the viability and quality of both research methods and thus affected the end result negatively.

The thesis did not quite play out as was originally planned and the results gained from the used methods were not as solid as I would have hoped. But nevertheless, there were still positive sides in the process as well. For example, getting volunteer participants to test IKEA's AR application and having qualitative interviews with the participants proved to be fruitful in a sense of gaining insight on the viewpoints regarding user experience and current state of available AR content.

Thinking about this thesis process as a whole, it had a lot to be enhanced to be generally better. Personally, I did not anticipate the thesis process to be quite this demanding both mentally and workwise which was an overlook on my part. Planning and sticking with time schedules proved hard due to working, other studies and unexpected hardships in personal life outside of studying, which dwindled the chances to work as efficiently with the thesis research as I would have hoped. This along with undetailed planning and expecting to be able to perform better in shorter time frames than in reality caused the thesis process to be elongated and still towards the end rushed.

All in all, this thesis process did not go quite as planned and the end result expected versus the result that was produced left a lot to be desired with. The long process has still taught me patience and has given me better understanding of my own working capabilities. Last but not least I want to express my gratitude to all the questionnaire respondents and interview participants for their contribution to this thesis.

References

Amazon 2019. View In Your Room. URL: <https://www.amazon.com/adlp/arview> Accessed: 26 October 2019

Brace, I. 2018. Questionnaire design: How to plan, structure and write survey material for effective market research. 2nd edition. Kogan Page. London.

Business Dictionary 2019. Customer perception. URL: <http://www.businessdictionary.com/definition/customer-perception.html>
Accessed: 14 August 2019

Cambridge Dictionary 2019. Augmented reality. URL: <https://dictionary.cambridge.org/dictionary/english/augmented-reality?q=Augmented+reality> Accessed: 14 August 2019

Dacko, S. 2008. The Advanced Dictionary of Marketing. Oxford University Press. New York.

Google Play 2019a. Amazon Shopping – Search Fast, Browse Deals Easy. URL: <https://play.google.com/store/apps/details?id=com.amazon.mShop.android.shopping>
Accessed: 30 October 2019

Google Play 2019b. Houzz -Home Design & Remodel. URL: <https://play.google.com/store/apps/details?id=com.houzz.app> Accessed: 30 October 2019

Google Play 2019c. IKEA Place.
URL: https://play.google.com/store/apps/details?id=com.inter_ikea.place&gl=FI Accessed: 30 October 2019

Houzz 2019a. About Houzz. URL: <https://www.houzz.com/aboutUs> Accessed: 26 October 2019

Houzz 2019b. Cover Your Floor in Virtual Tile Using Houzz's Enhanced App.
URL: <https://www.houzz.com/magazine/cover-your-floor-in-virtual-tile-using-houzzs-enhanced-app-stsetivw-vs~120321326> Accessed: 26 October 2019

IKEA 2019. IKEA About Us. URL: <https://www.ikea.com/gb/en/this-is-ikea/about-us/>

accessed: 26 October 2019

IKEA 2017. IKEA Place -sovellus. URL: <https://www.ikea.com/fi/fi/news/ikea-place-sovellus-pub74be1e00> Accessed: 14 August 2019

Inter IKEA Group 2018. IKEA Place launches on Android allowing millions of people to reimagine home furnishings using AR. URL: <https://newsroom.inter.ikea.com/news/ikea-place-app-launches-on-android--allowing-millions-of-people-to-reimagine-home-furnishings-using-/s/28215cac-8f4e-4ee5-87a4-56a998290856> Accessed: 26 October 2019

Inter IKEA Group 2019. IKEA sparks home furnishing ideas and inspiration through Artificial Intelligence. URL: <https://newsroom.inter.ikea.com/news/ikea-sparks-home-furnishing-ideas-and-inspiration-through-artificial-intelligence/s/77ed5adf-d6b> Accessed: 30 October 2019

Khan, M. 2006. Consumer Behavior and Advertising Management. New Age International Publishers. New Delhi.

Marxent 2019. 40 AR Examples -The Definitive Guide to Augmented Reality in Retail. URL: <https://www.marxentlabs.com/ar-in-retail-top-augmented-reality-retail-apps-guide/> Accessed: 27 September 2019

McGivern, Y. 2013. The Practice of Market research: An Introduction. 4th Edition. Pearson. Harlow.

Saunders, M. 2016. Research Methods for business students. 7th edition. Pearson Education. Harlow.

Statista 2019a. Augmented reality (AR) market size worldwide in 2017,2018 and 2025 (in billions U.S. dollars). URL: <https://www-statista-com./statistics/897587/world-augmented-reality-market-value/> Accessed: 27 September 2019.

Statista 2019b. Brand value of the leading 20 most valuable retail brands worldwide in 2019 (in million U.S.dollars). URL: <https://www.statista.com/statistics/267870/brand-value-of-the-leading-20-most-valuable-retailers-worldwide/> Accessed: 29 October 2019

Statista 2019c. Leading furniture and home decoration retailers Finland as of 2018, by Turnover (in million euros). URL:<https://www-statista-com./statistics/947137/leading-furniture-retailers-turnover-finland/> Accessed: 20 October 2019

Tuominen, K. 2016. Introducing Benchmarking. Oy Benchmarking Ltd. Turku.

YouTube 2019a. Houzz View In My Room 3D: meet the team. URL:
<https://www.youtube.com/watch?v=NKdS9xyj6co&t=70s> Accessed: 30 October 2019

YouTube 2019b. Introducing AR view. URL:
<https://www.youtube.com/watch?v=uhdOzpbIrm0> Accessed: 30 October 2019

YouTube 2019c. Say Hej to IKEA Place. URL:
<https://www.youtube.com/watch?v=UudV1VdFtuQ> Accessed: 30 October 2019

Attachments

Attachment 1. Qualitative Interview Form

Interview about the IKEA Place AR application user experience

This Interview is a follow up after the testing of IKEA Place application on a smart device. This interview's aim is to determine and analyse how the test users felt about using the application, which attributes the application has that the test users found useful and what could be done better. This Interview does not collect the test user's detailed personal data. Only demographics asked will be first name and age only for the interviewer to identify different test users. This however, is not mandatory, if the participant does not wish to give out this information.

In the testing the participants were instructed to test the application approx. 30 minutes up to 1.5 hours during their own free time. After the participants had tested the application, individual interviews were scheduled with each of the participants. The test users were free to use the application with the smart device of their choice and they were given a short introduction what the application was about without going into detail how exactly the application worked.

The ultimate goal of this interview is to contribute to a bachelor's thesis about AR technology's usage in marketing in the furniture and home accessory retail industry where the goal is to determine how could Finnish furniture and home accessory retail companies could enhance their business to customer marketing by implementing AR tech into their marketing efforts.

This Interview consists of three parts. The demographics for research, user experience, and finally optional free feedback.

Lauri Lindén
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*Pakollinen

Part 1: Demographics for the research

Participant details and prior knowledge of the IKEA Place app

1. First Name

2. Age

3. Did you know about the Ikea Place application prior to this testing? *

Merkitse vain yksi soikio.

Yes

No

4. Have you used the Ikea application prior to this testing session? *

Merkitse vain yksi soikio.

Yes

No

Part 2: IKEA Place application test user experience

5. In your opinion, what did you think of the layout of the application? *

6. What do you think of the application's user friendliness? *

7. In your opinion, what was good in this application? *

8. In your opinion what are the points of improvement for this application? *

9. How do you feel about the helpfulness of this application in planning for buying furnitures and home accessories? *

10. Would you use this application again, why? *

Feedback (Optional)

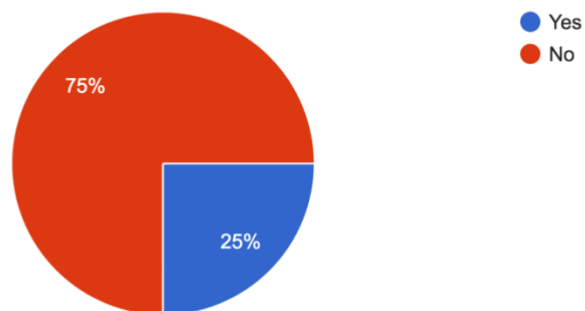
11. Feedback (Optional)

Palvelun tarjoaa
 Google Forms

Attachment 2. Interview Results

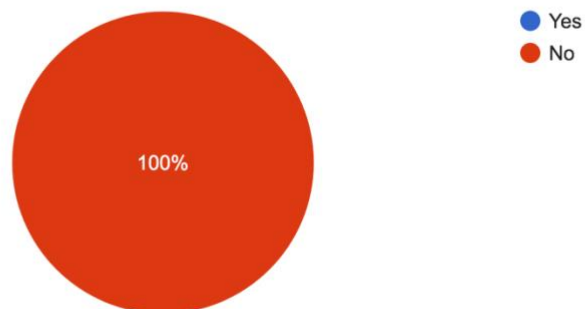
Did you know about the Ikea Place application prior to this testing?

8 vastausta



Have you used the Ikea application prior to this testing session?

8 vastausta



In your opinion, what did you think of the layout of the application?

8 vastausta

It was at the start a bit confusing. After figuring out how the application worked it seemed much clearer.

The start felt really weird with the text message kind of intro but otherwise the layout of the application seemed clear.

It was clear when checking the product catalogue or which object to show.

The catalogue part was clear, but using the application otherwise did not generate trust.

It was okay, there was nothing that special about it. It was pretty clear.

The layout was mostly the application guided the start pretty well, but the it could have had explanations what the different buttons do.

It was bad there was clearly no UX design used.

The general layout was pretty clear. No mentionable issues with it.

What do you think of the application's user friendliness?

8 vastausta

It could be better, sometimes there was trouble moving and scaling the objects. The idea of point and drop the items is nice but it would need enhancing.

The scanning of the room felt really unclear on whether you would need to scan the whole room or just a part otherwise picking the products and placing them felt nice.

The catalogue part was good but the otherwise the application was bad. It was hard to move and turn the objects and scaling and sizing was off.

Using the application was hard. The selected pieces of furniture did not stay put and they were hard to manoeuvre. The selected furniture's measurements were only somewhat giving an idea of their size.

It was garbage, the application was hard to use, laggy and inaccurate.

The starting chat with the application was very user-friendly but after the start the application was pretty complicated and hard to use.

Unfriendly, it was hard to use and it did not work smoothly.

The chat-like start was good, but other than that the application was not working as it should. The objects were hard to place the way you wanted and the size was not correct.

In your opinion, what was good in this application?

8 vastausta

It has a look up feature where you can point to a piece of furniture and then the app gives you suggestions from Ikea's catalogue. Also the information about the products right away available in the application is really nice. The idea of the application of furnishing your room with the app is nice but it would be nicer if the app would work better.

The sizing of the furniture was not quite correct but it was still pretty close to a real one so it was quite impressive.

The catalogue of products and the product information was good. Also seeing the colour of different objects against the surroundings was nice.

The idea of the application is really good. It is nice that you can visualise the furniture. This application can be good for planning to buy some specific decorative objects.

The idea behind the app is good but at this state there is not any mentionable positive sides.

The fact that it uses AR so you do not need to leave home to check the Ikea furniture out.

Choosing the products and the catalogue of products was good.

The scanning of your own furniture to get suggestions from the catalogue was nice.

In your opinion what are the points of improvement for this application?

8 vastausta

User friendliness, scaling, sizing and moving the objects works poorly.

Placing the furniture was annoying cause sometimes the objects floated mid-air or they didn't stay put. Also if you want to redecorate your room it would need to be empty with this app. One great improvement would be the ability to scan your room you want to decorate, and while you are in Ikea store and you find something you like you could place it into your room in the app while at the store.

The objects should be easier to rotate and move around the room. The scaling and sizing of the objects should be done better to match the real world objects.

General user friendliness like manoeuvring the pieces of furniture, and scaling and the sizing of the furniture.

Making the application run well, sizing and moving the furniture around.

Explaining the different features of the application more accurately and to have closer to real models for the products.

Making the user experience (UX) clearer, so the application would be easier to use.

Moving the objects and the sizing should be fixed. Also sometimes the objects start moving by themselves, float mid-air or disappear.

How do you feel about the helpfulness of this application in planning for buying furnitures and home accessories?

8 vastausta

It could be useful, especially if you want to see if some furniture fit in your room, if it would work correctly. It is also nice to see the products and how they look without the need to actually go to Ikea.

It is nice to kind of see what are the proportions of furniture and see how they looks, but it is still more helpful to see them in the store.

It's not currently helpful because it doesn't work as it should.

It is helpful when using it for finding decorative products which you do not need to test unlike chairs or beds. It is good for checking the colour world of the products.

It is currently useless. It is way too inaccurate to be useful.

It is actually quite helpful because it helps Ikea to compete with other furniture stores and it helps online shopping because you can do the shopping from home and don't need to go to the store first and then return the products if you don't like them.

It would be helpful if it would work properly and smoothly.

It's currently helpful if you search something specific with the scanning and the catalogue. Otherwise the application is not that helpful cause it's working poorly.

Would you use this application again, why?

8 vastausta

I probably would, just for the fun of seeing what the different products look like.

Maybe, i might use it if I wanted to quickly check the close to proportions of the piece of furniture and how it would look in my room.

No because the application is bad, and I do not have the patience to play with it. Maybe then if I want to check how the colour of some furniture fits into my decoration.

Yes, if the issues with the user-friendliness are fixed in the future. As said earlier the idea of the application is good.

No, because the application does not work well at the moment, the inaccuracies and the laginess made it frustrating to use.

I think I would use it again if the application would generally be better, more features and the products would look more realistic. Then I could use it for shopping from home, but currently I would not use it, because it is not feeling ready yet.

No, because the sizing of the products was not accurate, so I see no use for it

Probably not. I can look up Ikea's products elsewhere. I could use the application again if it would work better, and the size of the products would be more realistic.

Feedback (Optional)

2 vastausta

Thanks for the interview! I think it was well done and made me realize that I was glad I don't have to rely on technology that isn't ready yet in my life. Maybe one day it'll actually be useful though so best of luck!

The interview covered the usage of the app thoroughly and gave insight to the improving of the app, which would give the app and the company advantage in the market. Overall, a great interview, which was enjoyable to answer.

Attachment 3. Quantitative Questionnaire Form and Results

Questionnaire about Augmented Reality Content Experiences

This questionnaire is targeted to people over the age of 18 years living in Finland to determine the awareness and opinions the respondents have about augmented reality technology (AR).

Description of Augmented reality content: AR content means added images visible using a smart device camera or smart glasses that only appear on the device screen but not in the real world. Some examples of AR content are a popular smart device game called Pokémon GO which shows the Pokémon figures on the device screen while the user uses the smart device camera to look around, or Ikea's Place application that gives the users the possibility to place furnitures and other home accessories into their homes while using a smart device camera.

The goal of this questionnaire is to determine what kind of AR content have the respondents encountered, how aware they are of this technology, and what kind of opinions the respondents have considering this technology. The data from this questionnaire will be used for a bachelor's thesis about Augmented reality's utilisation in the furniture retail industry, to gain insight on the awareness and the opinions the respondents have about augmented reality content.

This questionnaire will not collect any detailed personal data from the respondents. The only demographic asked is the respondents age to determine the age spread of the respondents.

Please answer all the questions marked mandatory, and at the end of the questionnaire there is a possibility to give free feedback about this survey. The feedback is totally optional but much appreciated! And last but not least, thank you for answering!

Lauri Lindén
Haaga-Helia University of Applied Sciences

*Pakollinen

Demographics for Research

1. Age Group *

Merkitse vain yksi soikio.

- under 21-years-old
- 21-30-year-old
- 31-40-year-old
- 41-50-year old
- 51-60-year old
- over 60-years-old

Questions about familiarity with augmented reality content and applications utilising it

In this part there are questions that will determine your familiarity and interest towards augmented reality content and applications that utilise this technology.

2. How familiar are you with AR content in general? *

Merkitse vain yksi soikio.

- Very familiar
- fairly familiar
- slightly familiar
- not at all familiar

3. How familiar are you with applications that utilise AR technology? *

Merkitse vain yksi soikio.

- Very familiar
- Fairly familiar
- slightly familiar
- not at all familiar

4. In your opinion, would you be interested on using a smart device application that utilises AR technology? *

Merkitse vain yksi soikio.

- Very interested
- fairly interested
- slightly interested
- not at all interested

Questions regarding Ikea Place application

Ikea has a smart device application that utilises AR technology called Ikea Place. The Idea of the application is that the user can place various Ikea products into their own houses by using the smart device's camera.

The user can look around the space with the smart device's camera and drag and drop wanted items into the wanted places and through this give the user an idea, what would the products look like in the space where users would want to place them.

5. In your opinion would you be interested to try this kind of application?

Merkitse vain yksi soikio.

- Very interested
- fairly interested
- slightly interested
- not at all interested

6. In your opinion, would being able to visualise the products in your own home affect your purchase decisions?

Merkitse vain yksi soikio.

- Strongly agree
- Agree
- Disagree
- Strongly disagree

FeedBack (Optional)

In this part you can give free feedback about the survey. All feedback is much appreciated!

7. Feedback (Optional)

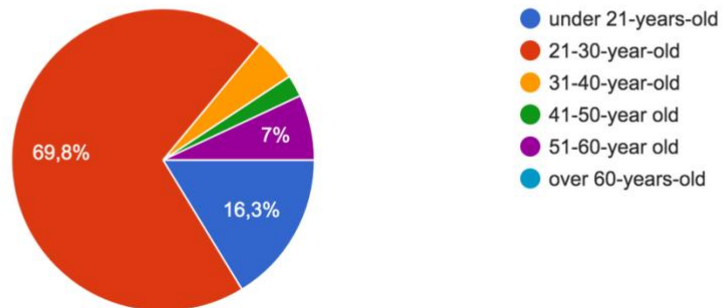
Thank you for Answering!

Palvelun tarjoaa
 Google Forms

Attachment 4. Questionnaire results

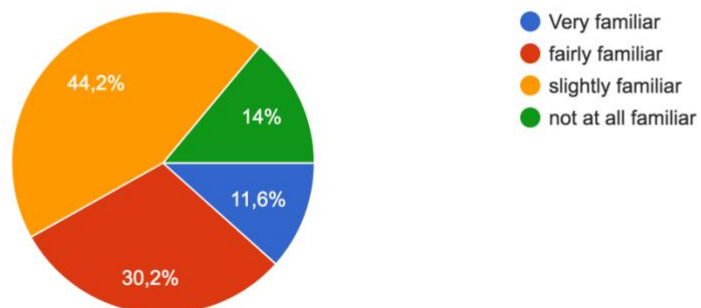
Age Group

43 vastausta



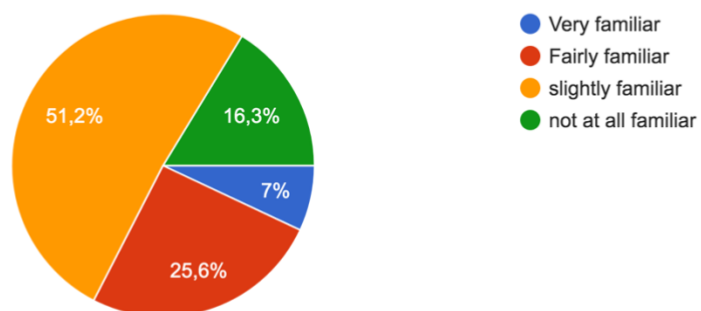
How familiar are you with AR content in general?

43 vastausta



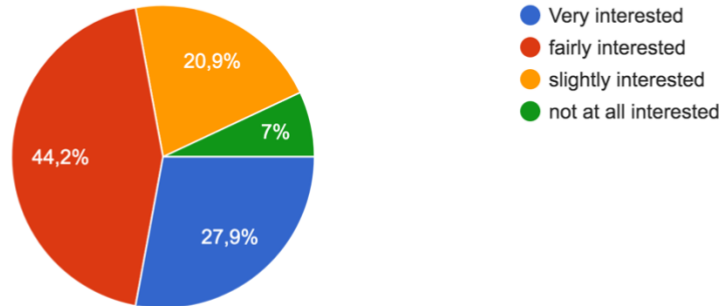
How familiar are you with applications that utilise AR technology?

43 vastausta



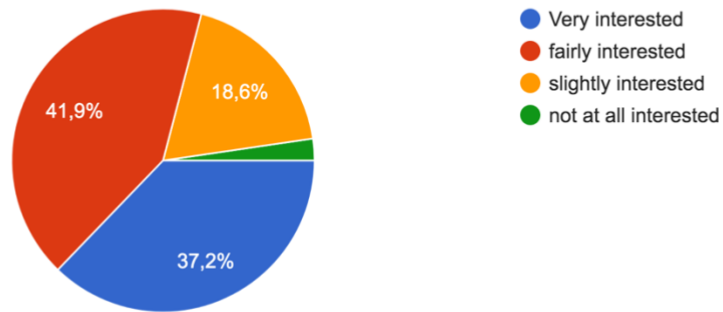
In your opinion, would you be interested on using a smart device application that utilises AR technology?

43 vastausta



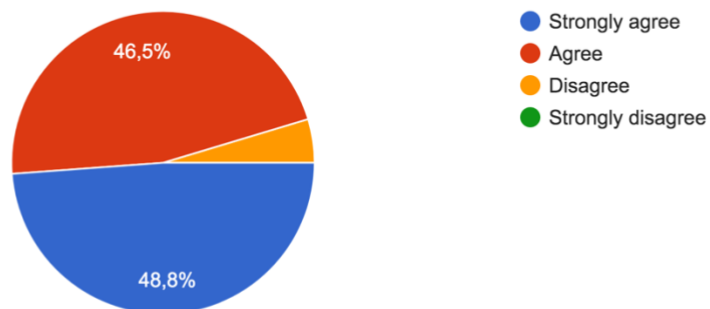
In your opinion would you be interested to try this kind of application?

43 vastausta



In your opinion, would being able to visualise the products in your own home affect your purchase decisions?

43 vastausta



Feedback (Optional)

10 vastausta

Very well-written survey with nicely pointed questions. Good length of the survey and worded well. Great job!

I'm able to choose several options at the same time, i.e. "not familiar at all" AND "slightly familiar". This might skew the data.

Im really looking forward to seeing what AR has to offer in the future and Im really glad to be on the forefront of innovation like this. I believe this will have fantastic real world application in the long run and I wish the best for you and your research!

Thanks for the survey and good job!

I dont really need anything right now but if i did i would definitely use this. Anything that helps me stay at home is a huge plus in my book.

Good questions interesting topic!

Tsemppiä 👍

Tsemppiä :)

Clear survey, could have been more complex and go deeper in the subject

Great survey! Good explanations etc. :)