An analysis of online attraction and user experience on an e-commerce website

Case Byggmax.fi

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Abstract:

The purpose of this study was to use an eye-tracking device alongside respondent interviews to explore the user experience and visual attention of Finnish consumers on the redesigned e-commerce website Byggmax.fi. Based on the authors own involvement in prelaunch testing of the website and discussions with several key person in the management of Byggmax three research questions were raised. To assess the user experience and usability of the site the frameworks of the FFF model and The UX Pyramid was reviewed, described, referred to and used. In terms of data collection, tasked eye-tracking sessions were used alongside post-session respondent interviews; background information and demographics of the respondents were collected by a brief online survey. The results of the study showed that regarding visual attention, most of it was focused on natural elements in accordance with the performed tasks; like search field, category menus, product listings, etc. Remarkable was that not much attention or mouse clicks was focused on the site's biggest element, the home page banner, even if it communicated a message directly correlating with the need in the task of the respondents. Regarding the user experience and usability of the site it occurred from watching gaze replays and analyzing post-session respondent comments that the site overall is perceived usable and nicely designed even if it does contain some issues and things to further develop. Breaking the results down, it can be said that the single largest finding concerned a trust issue within the payment phase in the websites checkout; the respondents got confused and experienced negative feelings when the checkout asked for their social security number in a way they were not accustomed to; beyond this finding also several other minor issues and insights were discovered regarding the usability. Making changes to the flow of the checkout would most certainly according to this study be in the best interest of both Byggmax and its customers.

Keywords:	Online attraction, consumer behavior online, usability, user experience, eye-tracking, visual attention, Byggmax
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1 INTRODUCTION

During the last ten years the use of internet has grown significantly worldwide as it has become a normality for many people to have access to the internet practically all the time through different types of devices. To put this statement into perspective, about 1.6 billion people used the internet in 2008 when in 2018 again the amount totaled to just slightly under 3.9 billion; an increase of 160 % in ten years (Statista 2019). The increase in internet accessibility and usage has clearly also affected online commerce positively as more and more people buy goods and services through different online channels. According to the statistical office of the European Union (EU), Eurostat (2019), 60 % of individuals aged 16 to 74 within the EU used the internet for ordering goods or services in 2018; the same number in 2008 was only 32 %. Regarding Finland the same numbers for individuals aged 16 to 74 who bought goods or services online were 51 % in 2008 and 70 % in 2018 (Eurostat 2019).

There are different online environments that are perceived and interacted with very differently by consumers, e.g. a plain online newspaper vs. an interactive e-commerce site; therefore, a website being the tool for making electronical transactions must be designed in a way so that users effectively can manage to make a purchase. Unlike non-commerce websites it is not enough for e-commerce sites to provide the users with a functioning site that has a clear and efficient layout, no, e-commerce sites must reach past this and somehow convince site visitors to commit themselves to carry out a financial transaction online. This is why e-commerce providers have to pay significant attention in their online user experiences since annoyed and frustrated users easily leave and chooses a competitors site over yours (Bergström, J.R. & Schall, A. 2014 p.187-188).

Eye-tracking is an established research method to use when wanting to understand the usability and effectiveness of a website as it both reveals problems in flows and function on the site and also collects hints on how to possibly fix them. Identifying issues regarding design and functionality both increases the site performance, optimizes the user experience as well as positively impacting conversions and sales numbers (Tobii 2018a).

This thesis is a commissioned case study in which the commissioning party, Byggmax AB, has requested an eye-tracking study to be carried out on their re-designed Finnish e-commerce website, i.e. Byggmax.fi, in order to gather data and insights on consumer behavior, user experience (UX) and usability of the website. Byggmax AB is a Swedish stock listed company focusing on sales of building materials in a retail setting with active operations in both brick & mortar and e-commerce in three Nordic countries; Sweden, Norway and Finland.

1.1 Byggmax Group AB

The business idea of Byggmax is to sell a focused assortment of building materials and other products to so-called Do-It-Yourself (DIY) customers to the lowest possible price. This is done through cost efficient operations in both brick & mortar stores functioning with a self-service oriented drive-in concept and a customer-oriented e-commerce website offering a wider assortment range and building tips and inspiration in form of DIY projects and instruction videos. In 1993 the first store was opened in the town of Täby, Sweden, and back then the company was still called Gunnars Byggnetto before permanently changing the name to Byggmax in 1999 after testing names like Byggnetto and Netto-Netto in between. In 2006 the majority of Byggmax shares was bought by a private equity firm, Altor 2003 Fund, that had a strong belief in Byggmax and wanted to further expand the concept domestically but also abroad from Sweden; Byggmax expanded to Norway in March 2007 opening the first Norwegian store in the city of Hamar and to Finland in February 2008 when Turku became the first Finnish city to host a Byggmax store. The Norwegian subsidiary is called Filialen Byggmax Norge and the subsidiary in Finland is called Filialen Byggmax AB Finland. The expansion continued with a high pace in all three operating countries and in June 2010 Byggmax was enlisted to the Stockholm OMX Nasdaq stock market. During 2013 Byggmax converted all the existing stores into a new store concept called Byggmax 2.0 alongside further expanding the Nordic store network. The majority owner, Altor 2003 Fund, sold all its Byggmax shares in 2014 after growing the business in eight years from a network of 27 stores with a combined 1.1 billion SEK turnover to a network of 107 stores with a combined turnover of 3.2 billion SEK. After Byggmax acquired Buildor.se, a company specialized in e-commerce of building materials, in late 2015 and Skånska Byggvaror, a

leading Nordic company within conservatories and greenhouses, in early 2016 Byggmax Group AB was formed. The group consists of Byggmax AB (incl. the Norwegian and Finnish subsidiaries), Buildor.se and Skånska Byggvaror and in 2017 the turnover was 5.3 billion SEK. In 2018 Byggmax updated the company's visual look; the new look was presented to the public in accordance with the opening of Byggmax 100th store in Sweden on the 23rd of November 2018 in Stenungsund, Sweden. After the opening of the store in Stenungsund Byggmax has 151 stores in total; 100 in Sweden, 40 in Norway and 11 in Finland (Byggmax 2017; Byggmax 2018a; Byggmax 2018b; Byggmax 2018c; Altor 2014).

Figure 1: The new Byggmax logo at the entrance of Byggmax Stenungsund (Byggmax 2018c)

1.1.1 Byggmax e-commerce

Byggmax originally launched their e-commerce site in 2009 in all operating countries with the intention to expand the offering of sales channels for the products sold in the brick & mortar stores. In 2011 Byggmax widened the assortment of building materials and other DIY home & garden products on the e-commerce site by introducing an order selection only available for customers online. Byggmax offers its customers over 40 000 products online and the customers can also check real time prices and stock levels for products on a single store basis online at the same time when checking for product information and inspiring DIY instructions (Byggmax 2017).

The website was back in 2009 completely tailor made for Byggmax from scratch and not built using any interactive standard platform for e-commerce sites; this meant that making changes and updates to the site was going to be demanding and laborious going forward after the launch. Roughly speaking, the Byggmax e-commerce site has been the same since 2009 on to this day when it comes to design and usability. Both critical feedback about usability from the customers as well as employees and the realization internally in Byggmax that the old websites lifecycle had come to its end contributed to Byggmax making the decision of designing and building a whole new website for the company; this time using a more modern and interactive platform in the making. Byggmax worked together with e-commerce consultants on developing and building a new website for over a year and then launched the Finnish site at 14th of November 2018.

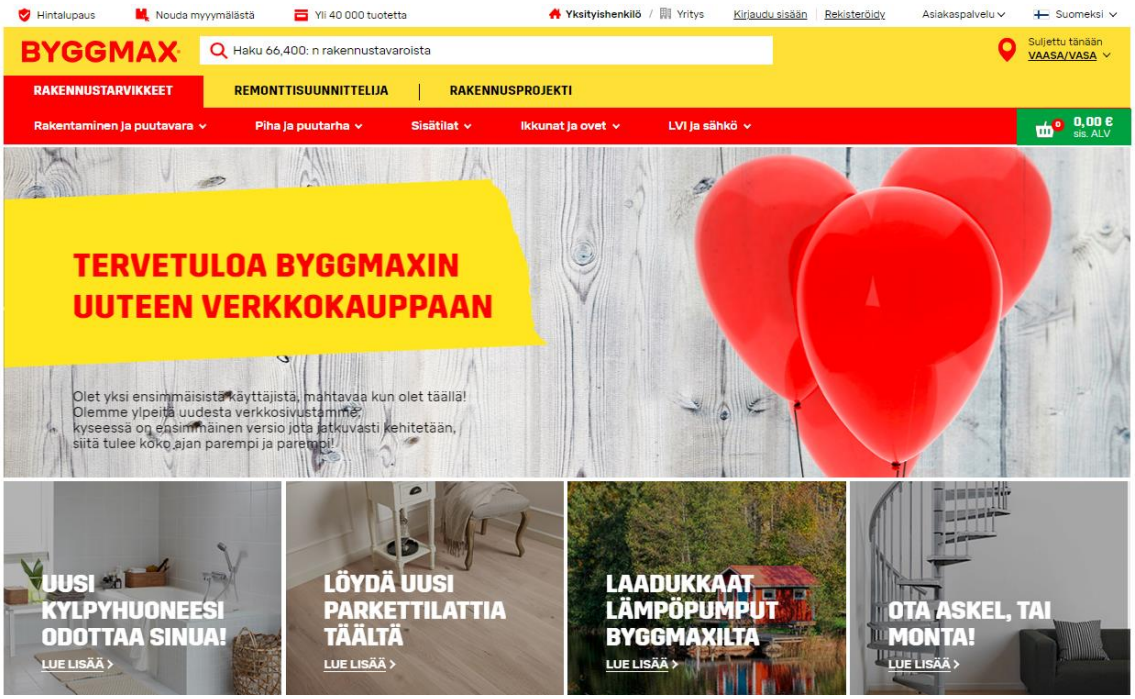

Figure 2: Byggmax re-designed e-commerce website; accessed 25.11.2018 (www.byggmax.fi)

1.2 Statement of the problem

When customers interact online with an e-commerce site the level of usability and the actual user experience play a significant role when it comes to making a purchase decision and becoming a paying customer. Therefore, it is of great importance as an actor

within e-commerce to know if your design and platform delivers a good user experience to the customers interacting with it; and if not then why? This is also exactly what the commissioning party of this thesis wants to find out regarding their re-designed e-commerce site. Therefore, the research of this thesis will try to answer questions like what attracts the customers attention on Byggmax.fi and is the interaction on Byggmax.fi perceived user friendly or does it contain clear problems that affect the usability and user experience?

1.3 Background and need

Since usability and user experience has been the main development areas for Byggmax re-designed e-commerce site the assumption and belief of the commissioning party is naturally that the design, usability and user experience all are on a high level; these assumptions have though never been researched or investigated in detail with actual customers. The usability has of course been tested in-house by web-designers and other Byggmax employees but not in a setting where customer behavior is observed in live sessions with the possibility to give post-session feedback. Byggmax has got all the common data, metrics and analytics in place concerning site performance like visit counts, visit duration, specific page visits, average order value, source of visit, etc. but are very interested in gaining insights also on the actual behavior, attention attraction and perceived user experience of the consumers visiting the website. To verify the assumptions and beliefs or to discover possible problems on the re-designed website regarding the design and user experience of it are the main reasons why Byggmax commissions this thesis. At writing moment of this thesis Byggmax has just launched the re-designed Finnish e-commerce site to the public which means that the time to carry out a tasked eye-tracking study to reveal flaws or so-called bottlenecks in the user experience is optimal. Byggmax will benefit from this research since this kind of a study has not been carried out before on the re-designed website and the valuable results of this research can most certainly also be applied at least in some extent on the company's Swedish and Norwegian websites; i.e. since the sites mostly only differ from each other in language and product offering and not in design or usability. The findings in this research can be valuable also for any other actor within e-commerce since good usability

and user experience are common advantages and areas of interest within the field and does therefore not only concern the specific website of Byggmax.

The author's personal connection to Byggmax started in January 2011 and has gone on ever since. During this time, the author has worked both solely within the Finnish subsidiary, Filialen Byggmax Ab Finland, and together with the Swedish parent company, Byggmax AB in positions as Salesman, Store manager, B2B-sales manager and Business Development Manager. This work experience within Byggmax has resulted in many ways of both positive and negative interaction with the company's e-commerce site from different standpoints and views together with both customers and colleagues. These experiences together with the direct involvement in proof reading, improving and usability testing of the Finnish re-designed website for Byggmax has generated a desire and interest within the author to further study websites usability and user experience.

The clear assumption by key persons in the management of Byggmax is that the re-designed website has good usability and that it delivers a smooth user experience for site visitors and potential customers; i.e. because these topics have been in the center of the development process of the re-designed website. Regarding attraction of visual attention, the assumption by key persons within Byggmax management is that customer's attention will most likely be drawn firstly towards the new logo of Byggmax as well as towards the main home page banner when entering the site; on the product pages again the large product pictures will most likely first draw the customers attention. Another thing that the commissioning party wants to find out is if it is easy for the users to find the directions to their nearest Byggmax brick-and-mortar store through the website. This is important for the commissioning party to find out since they sell products and materials that customers often want to see in reality (like e.g. flooring or tiles) before making the purchase decision; therefore, it is very normal for customers to use the Byggmax website to browse products in advance, check for the nearest physical store and later check out the products in-store. These assumptions have their origin in the author's pre-thesis discussions with several key persons within the management of Byggmax.

1.4 Purpose of the study and research questions

The purpose of this study is to use an eye-tracking device with tasked respondent sessions alongside respondent interviews in order to explore the user experience and the visual attention of Finnish consumers on the re-designed e-commerce website Byggmax.fi. The following research questions are raised for this thesis:

- **RQ1**: What attracts the customer's visual attention on Byggmax.fi?

- **RQ2**: Is the shopping process and the user experience (usability) on Byggmax.fi user friendly?

- **RQ3**: How was the visual attention and the user experience perceived post-session by the respondents and what would they change on the site?

1.5 Limitations

The geographic and empirical limitations of this thesis are to only conduct research on the Finnish e-commerce website, Byggmax.fi, and to only use a sample group of test persons that live in Finland and fit the target group of Byggmax in Finland; i.e. DIY minded people that are over 25 years of age. By limiting the research to only the Finnish website and to only use a sample group of people who live in Finland and fit the Byggmax target group will enhance the relevance of the results and findings. This research does not consider as limitations the participants earlier connection to the researched website or if they as customers are familiar with the company from before or not. Persons that have worked or are working for Byggmax are however excluded the possibility to take part in this research since their interaction with the website would not necessarily be authentic and could distort the validity of the results.

1.6 Thesis structure

This thesis consists of six chapters. Chapter one features an introduction to the topic, the background and need of this thesis, as well as a brief overlook on the commissioning

company, Byggmax AB, and its e-commerce development. In addition to this the first chapter also brings forward and elaborates on the problem statement, purpose, research questions and limitations of this thesis.

Chapter two comprises the literature review, or in other words the theoretical framework, of this thesis serving as the foundation for the research. E-commerce, online consumer behavior, online attraction and online user experience are the primary subjects of the literature review.

The empirical context as well as the research methods used are presented in chapter three of this thesis. More specifically chapter three gives insights into eye-tracking as a research method and the specific eye-tracking device used in this case. Furthermore, also the sample group as well as the setting and procedure for data collection are described; chapter three is rounded up by the analysis of output from the eye-tracker software regarding all recorded live sessions.

Chapter four shows an overview of the findings and results of the research and elaborates in detail on findings from the eye-tracking study providing answers to the specific research questions of this thesis. The validity and reliability of the results is also discussed in this section.

In chapter five the results and findings of the research are discussed and analyzed from the standpoint of both the commissioning company as well as the purpose and literature review of this thesis. Chapter six concludes the thesis and makes recommendations for the commissioning party as well as suggestions for further research.

2 LITERATURE REVIEW

The literature review provides a theoretical framework by explaining the main topics of this research and it also serves as the foundation for the research problem from which the actual research questions then are formulated. In the figure beneath (Figure 3) the topics included in the literature review of this thesis are visualized. The first two main

topics are e-commerce (section 2.1) and consumer behavior (section 2.2) which will be further narrowed down to consumer behavior online in subsection 2.2.1. Online attraction (section 2.3) is the third main topic in the literature review and the specific aspects of website design and visual attention attraction online will be addressed in respective subsections 2.3.1 and 2.3.2. The last main topic reviewed is online user experience (section 2.4) also covering the fields of website usability as well as the levels to success in website user experience in respective subsections 2.4.1. and 2.4.2.

Figure 3: Visualization of the literature review topics in this thesis

2.1 E-commerce

Running commerce such as selling, purchasing or exchanging goods, services or information over the internet with the help of technology and electronical devices is called electronical commerce or E-commerce. Simplified, it can be said that the process of doing business online over the internet is called E-commerce. There are several dimensions of E-commerce depending on the degree of digital and online involvement in the products, services and processes offered; in general commerce all these dimensions are

physical but in E-commerce either all dimensions can be digital or only partially digital. A good example here is ordering a book vs. ordering an e-book from the Amazon.com web shop; ordering a book is partial e-commerce since everything else in the process is digital except the physical book itself when again ordering the same book as an e-book is pure e-commerce since everything in the process is digital. E-commerce occurs in several forms like for instance online banking, company intranets, information services etc. between different actors like e.g. consumers, citizens, businesses, governments and employees. The main area for E-commerce is however consumer targeted websites intended for marketing and selling products and services (Loshin, P. & Vacca, J. 2004 p.3-5; Mansoor, A 2010 p.2-9). In his book, *E-Commerce: An Introduction,* Mansoor, A. (2010 p. 10-12) categorizes E-commerce actors into these three different common forms:

Click-and-Mortar Business

These businesses have their main business processes in the physical face-to-face brick and mortar setting but are also present online to some degree. Usually these businesses have been established in brick and mortar for some time already and therefore the idea here is to take advantage of the existing operations, resources, brand name and customer base by combining them with the benefits of an E-commerce site. The challenge for Click-and-Mortar businesses is that their primary business is not E-commerce, therefore they may fail to compete with specialized actors with expertise in the competitive area of E-commerce web sites.

Virtual Business

These actors run all their business activities and processes completely digitally in the online environment. These non-physical businesses are flexible, have low operating costs and face very low entry barriers towards the online markets where they sell mostly digital but also physical products in web shops and other electronic marketplaces. The biggest challenges for solely virtual businesses are managing orders around the clock, building lasting customer relations and having the consumers making purchase decisions relying only on screen-based text, pictures and videos without any tangibility.

E-marketplace

These electronic marketplaces are platforms or cross-roads usually managed by a third-party actor where online buyers and sellers meet up to engage in doing business with products, services, information, etc. E-marketplaces can be private, public, independent or consortiums and significant is that the owner, creator or facilitator of the E-marketplace does not engage as a seller or buyer at any time.

2.2 Consumer behavior

The context of understanding consumer behavior is not simple since both consumers' behavior and decision-making factors are affected and influenced on many levels, both internally and externally, by several different actors in the process leading up to and following a purchase. Kotler et al. (2017) simply explains consumer buying behavior as when consumers like individuals or households purchase products and services for their personal use. Michael R. Solomon (2011) defines consumer behavior in a more detailed way as *"the processes involved when individuals or groups select, purchase, use, or dispose of products, services, ideas, or experiences to satisfy needs and desires"* in his book *Consumer Behavior: Buying, Having and Being*. Consumer behavior is more than only the actual transaction of money and goods between a consumer and a provider, it is of much more value, even if not easy, to understand why different types of consumers act and behave in certain ways in different situations. Consumer behavior is a process involving issues before, during and after a purchase both for the consumer and for other involved actors like e.g. marketers, companies and influencers; these are called pre-purchase, purchase and post-purchase issues. Consumers evaluate in their mind during the purchase process things like where they find information, if they really need it, how much effort needs to be put in, what does the purchase communicate to others, does the product or service really serve its intention, will the person that gets this as a gift like it, etc. In the purchase process it is notable that the person buying something and deciding what to buy is not always the person that will use it; e.g. when a mother or father buys clothes for their children or a person buying a birthday gift to a friend (Kotler et al. 2017 p.139; Solomon, M.R. 2011 p.33-35).

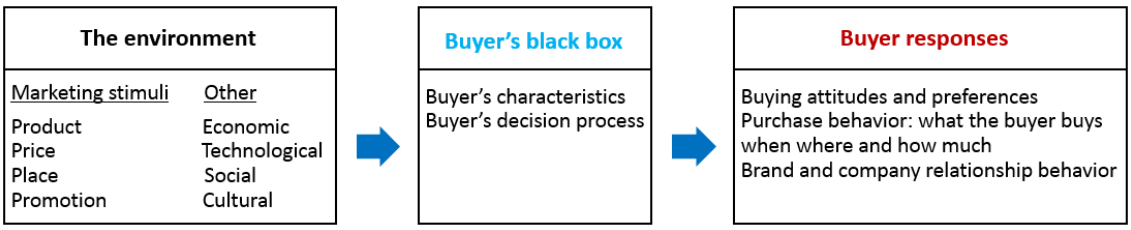

Figure 4: The model of buyer behavior (Kotler et al. 2017 p.139)

According to Kotler et al. (2017) the basis for consumer buyer behavior lies in the stimuli response model (Figure 4). Marketing stimuli that builds on the four P's (product, price, place and promotion) together with other consumer specific environmental stimuli like e.g. economic, technological, social and cultural stimuli make their way into the buyer's black box where they face the buyer's personal characteristics and decision-making features. The outcome of the activities in the buyer's black box is so called buyer responses; i.e. consumer specific buying preferences, purchase behavior and relationship behavior towards different brands and companies. It is the two activities within the buyer's black box concerning characteristics and decision-making that can specify and explain the whys that underlie consumer behavioral outcomes. Cultural, social, personal and psychological factors all impact consumer behavior and each of these factors can be broken down to individual more describing subjects (Figure 5) that are personal and cemented deeply inside consumers (Kotler et al. 2017 p.139-140).

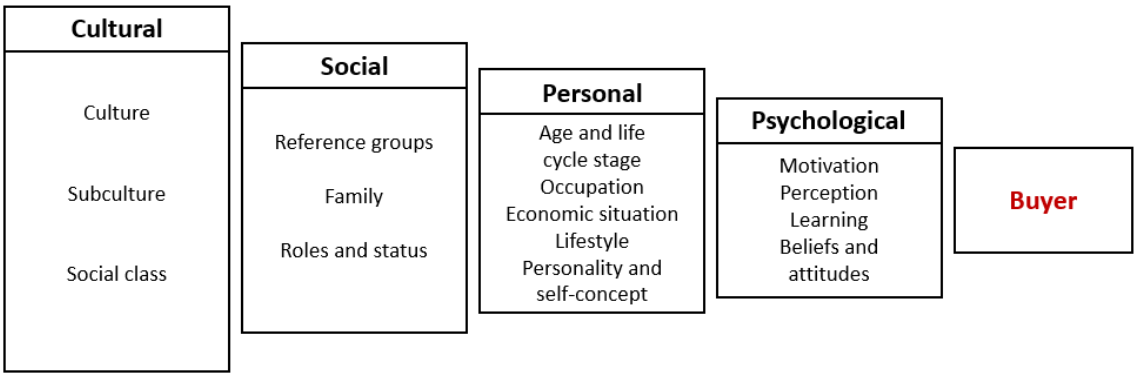

Figure 5: Factors that impact consumer behavior (Kotler et al. 2017 p.140)

Regarding the consumer decision making process there are five main steps that a con-

sumer goes through with different amounts of emphasis depending on the nature of the purchase. These steps are mentioned in a chronological order and described below:

1) **Problem or need recognition**

   The first phase in the consumer decision making process is the detection of a problem or a need that can be rectified by purchasing some certain product or service. A consumer may recognize a problem or need either through internal stimuli, i.e. when e.g. a person gets thirsty enough to buy a drink, or through external stimuli, i.e. when something outside of the consumers control like e.g. a TV show or a billboard activates a need or a buying desire. This first phase can also be explained to take place always when consumers see a big enough gap, that needs to be addressed, between their actual and their perceived ideal state no matter how big, small, easy or complicated it is to encounter. People make purchases to solve problems, satisfy needs and to adapt to shifting circumstances (Kotler et al. 2017 p.155-156; Solomon, M.R. 2011 p.336-337).

2) **Information search**

   After recognizing a need, consumers may search for information through several sources to help make a rational purchase decision; sometimes consumers though skip the information search and make purchase decisions at hand. The amount of effort and the type of information sources consumers use depends on their personal consumer characteristics as well as on the type of product or service that is being considered. Consumers can obtain information internally from personal experience and memories but mostly information is obtained from external sources like e.g. family & friends, neighbours, websites, social media, online consumer ratings, media channels and other similar personal, commercial and public sources (Kotler et al. 2017 p.156; Solomon, M.R. 2011 p.337-344).

3) **Evaluation of alternatives**

   After obtaining information about a product or service consumers use the information to evaluate the alternatives and brands that have come up and are considered as possible or suitable personally for them. Consumers use several different processes to evaluate and consider between alternatives and emphasize different

attributes more and others less depending again on their personal preferences and the nature of the situation. Usually the number of alternatives consumers finally choose from is quite small and sometimes consumers also use the help of external sources when evaluating a set of alternatives to form purchase intentions. Purchases are though also made constantly based on complete intuition or by impulse and therefore also the evaluation process is sometimes skipped (Kotler et al. 2017 p.156-15; Solomon, M.R. 2011 p.346-350).

4) **Purchase decision and product choice**

   To determine what product or service to finally buy after forming purchase intentions is getting harder and harder for consumers since companies and providers offer ever more features and aspects to choose from in their products and offerings. In most cases consumers choose the most preferred alternative from the evaluation process but the attitude of others, e.g. if a close person or relative disagrees with the decision, or unexpected events, like sudden changes in personal economy or unexpected price campaigns by other actors or brands, may step in and alter the final purchase decision; a purchase decision can also be reversed as it is a choice also to decide not to buy at all (Kotler et al. 2017 p.157; Solomon, M.R. 2011 p.351).

5) **Outcomes and post-purchase behavior**

   After purchasing, consumers will find out how their decision came out and that experience will determine how similar decisions are built up and made in the future. Post-purchase consumers will be either disappointed, satisfied or delighted with the outcome depending on how the purchase met the expectations set up in the pre-purchase phases. The amount of delight or dissatisfaction depends on how much over or under expectations the purchase delivered; consumers do however still evaluate post-purchase what they got and what they did not get by choosing one brand or product over another (Kotler et al. 2017 p.157; Solomon, M.R. 2011 p.332).

The decision-making process is an essential part in consumer behavior and the methods and processes used within the decision making varies broadly between consumers since

people are different and prefer or desire various attributes. The process of deciding involves many steps and the final decision may not always be the most rational, the type of purchase that is considered defines how much effort, if any at all, consumers put into each step before finally making the purchase. The internet has made it both easier and harder for consumers to make purchase decisions today; internet makes it easier and more accessible to get information and evaluate alternatives but at the same time also may overwhelm some consumers with too detailed information and too much alternatives to choose from (Solomon, M.R. 2011 p.362-363).

2.2.1 Consumer behavior online

Nowadays it is difficult to imagine a world without internet, smartphones, social media, etc. since the digital revolution has had such an enormous impact on how consumers behave, search for information, make decisions and interact with both providers and other consumers. The digital revolution has in a way eliminated all restrictions caused by time and location as it has enabled access, around the clock, to e.g. information, shopping & entertainment for consumers no matter where they are the moment a need or problem arises. Online consumers are increasing in number all the time and it is not only interaction between consumers and companies or service providers that increases since consumers also engage in activities with other consumers in different ways when seeking for information, opinions, products, services, friends, interests, etc. online (Demangeot, C. & Broderick, A.J. 2007 p.878; Solomon, M.R. 2011 p.46-47, 353-354).

Activity affiliated with consumption of products, services and information over the internet is known as online consumer behavior and it contains all from passive exposure to online content and marketing, browsing, shopping and information search to the selection of alternatives and execution of final purchase. The processes and factors affecting consumer behavior online are quite like the ones offline even if there are differences and therefore the frameworks of offline or general consumer behavior need alteration to be applicable for online consumer behavior. From a consumer perspective the online world differs from real life environments mostly by being virtual and somewhat flat or slim and not that tangible and vivid; the main reason for this is that an online environment only satisfies two of the basic human senses, i.e. sight and hearing, when a real life

environment adds on also the senses of smell and taste. It is notable though that there are different online environments that are perceived and interacted with very differently by consumers, e.g. a plain online newspaper vs. an interactive e-commerce site (Mansoor, A. 2010 p.223; Demangeot, C. & Broderick, A.J. 2007 p.878-879).

Consumers go through a decision-making process also online and the process is similar, but not identical, to the general five step decision-making model of identifying a need, searching for information, evaluating alternatives, making a purchase and evaluating the outcome post-purchase; online consumers may as well go back and forth between these steps or completely skip some step. There are factors beneath these general steps affecting online consumer behavior and decision-making; such factors influencing consumers online are e.g. the standard of website features like content, design, trustworthiness and functionality as well as the access to rating sites, consumer recommendations and other similar so-called online consumer purchase decision aids (Mansoor, A. 2010 p.224-226). A model regarding online consumer behavior was presented in 2012 by Dr. Ujwala Dange from Priyadarshini Engineering College and professor Vinay Kumar from S.B. Patil Institute of Management (2012) in their paper *A Study of Factors Affecting Online Buying Behavior: A Conceptual Model*. The model is called the FFF model and it is presented and described below:

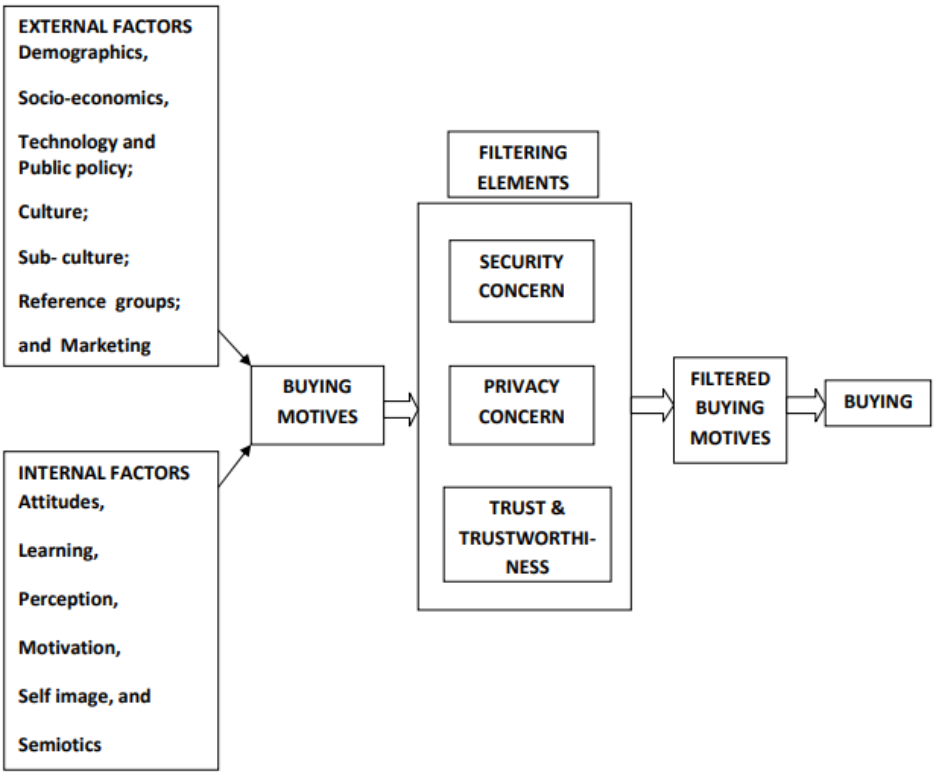

Figure 6: The FFF model describing online consumer buying behavior (Dange, U. & Kumar, V. 2012)

The three F's in the model stand for factors, filtering elements and filtered buying motives. The first stage of the model shows internal and external factors that motivate or drive consumers towards buying online; the external factors are such that cannot be controlled by the consumer, e.g. marketing, when internal factors like motivation or attitude again can be controlled. In the second stage these internal and external factors form consumer buying motives that are either functional, based on e.g. convenience, time or price, or non-functional that are based on brand preference or cultural and social values. The online purchase process offers consumers a lot of convenience but at the same time it also involves greater risks and concerns than the ordinary purchase process in brick & mortar stores for the consumer mainly considering areas of security, privacy and trust.

Security

Unfortunately both personal information and payment details can be lost in transactions done over the internet even if most actors use encryption, passwords and third-party providers to enhance security in activities between the web platform and the consumers interacting with it. Consumers are aware of the possible

security issues and therefore filter alternatives by evaluating them from a security perspective.

Privacy

Sites and online actors giving up consumers personal information to third-parties which then start contacting consumers with spam e-mails etc. are not appreciated by consumers and therefore consumers also filter the alternatives at hand from a privacy perspective by checking privacy policies and making sure their private information will be kept safe.

Trust

The most basic and essential element for people making online purchases is trust, without it the consumers will not engage and start a relationship with an online actor. Consumers tend to trust well known online actors more than smaller ones and overall trust is on a lower level online than in brick & mortar interaction.

These three elements of security, privacy and trust are all highly emphasized by todays aware online consumers and are therefore also the three main elements consumers use to filter between alternatives and form new so-called filtered buying motives before then finally making a purchase decision and eventually buying (Dange, U. & Kumar, V. 2012; Grabowski, P. 2017).

2.3 Online attraction

For ventures in the online environment there are two very constant challenges; firstly, how to attract the visitors' attention and secondly how to convince them to stay and start interacting with the site, both happening in only a timeframe of seconds after visitors' entering of the site. According to Andrew Kucheriavy (2018), who is a member of the Forbes Technology Council, the founder and CEO of Intechnic and one of the few person in the world who has been awarded the Master of User Experience certification, this window or span of the visitors' attention is decreasing all the time since people in today's world are being swamped with information coming in various forms from sev-

eral different sources or channels. Due to this fact people have learned to quickly process and filter out excess content and information that they do not perceive as valuable or interesting; the case of banner blindness, i.e. when people consciously avoid to even look at banners when browsing, is a good example of this fact. In his blogpost titled *Best Ways to Attract and Hold Online Users' Attention, Part 1* (2018) Kucheriavy, A. states that people only can pay attention to and deal with a single piece of content at once and he presents the following useful techniques specifically for capturing and holding the visitors' visual attention online:

- **Capture the eyes of your audience**; this can be done effectively by e.g. emphasizing movement or faces of other humans in the design of a website since people's eyes and attention naturally are drawn towards both these elements. Apart from these it is also effective to use bright or lively coloring, sizable images as well as simply bolding important text on the site.

- **Tap into primal urges**; the reptile part of the human brain all the time unconsciously assesses the surroundings for possible threats, companions and things to eat. That is why it can be helpful for websites to use these primal urges of danger, sex and food in different ways to acquire people's attention online. It is not however possible or suitable for everyone to take advantage of these human primal urges since they do not make enough or any sense in some circumstances.

- **Harness the power of emotion and storytelling**; creating positive or negative emotions through videos, pictures, sound, etc. will capture the attention of people and make them engage and take actions in some way. This part has a lot in common with the part "Capturing the eyes of your audience" presented above and as well emphasizes the use of a narrative throughout both the online and offline channels to make the experience more of an emotional story than just some occasional nice pictures or videos.

- **Provide your audience salient information**; people hardly pay any attention to information that is of no value or interest to them and therefore it is very im-

portant to provide as much prominent and noteworthy information that is easily accessible for the users and avoid putting up nonessential or irrelevant information online. Characteristics for prominent information are that it reflects empathy and understanding, it indicates expertise, the reader can relate to it and that it signals willingness to help and communicate. This part does not on its own catch people's attention online but together with the earlier techniques presented it will help to keep the users interested and create emotions.

- **Leverage the power of contrast**; displaying things in the way of e.g. before and after or good and bad etc. grabs the attention of people because they are in contrast with each other and can easily be compared by the user. Contrasts are therefore also effective for the concept of storytelling since they guide users towards better decision-making (good vs. bad) and implies attention raising progressive narratives (before vs. after).

Providing actual and truthful content and information is at the end of the day the most important thing when it comes to attracting and holding the users' attention online. Users do not appreciate being tricked or fooled into coming across irrelevant and invaluable content and will easily lose their trust towards any online actor guilty of doing so to them; the key is to provide valuable and interesting content that stands out, is easily findable and helps the user perform their task conveniently (Kucheriavy, A. 2018).

2.3.1 Website design

When it comes to websites it is of great importance that companies design their sites so that the site clearly symbolizes and demonstrates the company's ambition, background, vision, products, etc. and that the site is experienced as attractive by users at their first visit in order for them to stay; or even better if the site inspires users to make repeat visits to the site. Users of a website assess the site based on its ease of use and physical looks or attractiveness. Ease of use is evaluated by how fast the website loads; how easy the landing page is understood and how easy and quick it is to navigate pages further on the site. Physical attractiveness is reached by clean pages with good colors and absence

of excess content together with use of readable and size wise optimized fonts and typefaces. Regarding E-commerce the website design plays a significant role in the process of aiding, guiding and convincing the user towards successfully making a purchase and becoming a paying customer. Apart from ease of use and physical attractiveness companies also should pay close attention to designing security and privacy elements of the website as customer-oriented as possible. (Bergström, J.R. & Schall, A. 2014 p.187-188; Kotler, P. & Keller, K.L. 2016 p.639-640).

Jeffrey F. Rayport and Bernard J. Jaworski suggests in their book *E-Commerce* (2001 p.116) that effective E-commerce websites promote seven key design elements that the authors call the 7C's, these key design elements are:

1) **Context –** Presentation of the website's layout and design
2) **Content –** Text, pictures, sound and videos that the site contains
3) **Community –** How the website enables communication between users
4) **Customization –** The websites capability of customizing itself according to different users or allowing itself to be personalized by the users themselves
5) **Communication –** How the website facilitates communication from itself towards users or from users towards itself
6) **Connection –** The degree of which the website is linked and connected to other sites and pages
7) **Commerce –** The websites ability to enable commercial transactions

Website design is particularly crucial for e-commerce sites since the user firstly needs to understand what is sold on the site and secondly locate an item of interest in order to make a purchase and turn from a potential customer into a paying customer; no difference if the user already knows exactly what they are looking for or as more commonly just reckon on browsing to see what is offered and find something to purchase. The route to finding a product to purchase often goes through a home or landing page, category pages and product listing pages and therefore a thoughtful design of these requiring as little time and effort from the user as possible often result in a positive browsing and shopping experience. The home or landing page represents the same thing for an e-commerce site that a display window represents for a brick-and-mortar store; i.e. not

only the first thing a customer sees when approaching a store but also the first thing introducing the store or site, its offerings and how it is different from others. A home or landing page should only communicate the most essential things of the company and its products and avoid too much content and excessive information in order to keep the users interested and make them proceed with their browsing; less is more in this context of website design. All visitors however do not enter an e-commerce site through its homepage since they often land directly on a category or product page when arriving e.g. through a search engine, hence it is as important to apply a thoughtful and easy to use design on these so-called midlevel pages than it is on the homepage itself (Harley, A. 2018). Aspects of significance within design on these midlevel pages in e-commerce are according to Aurora Harley from Nielsen Norman Group (2018):

- **Clear organization and labeling regarding products and categories** so that they can be understood both on their own and in relation to other content on the site and allow the user to quickly navigate and click themselves forward.

- **Promotion of subcategories** in combination with search filters to help the users narrow down their searches to faster and more easily find what they are looking for; this is of most significance on sites offering broad product assortments.

- **Differentiating product information** to help the customers make their decision and answer their questions regarding the products without having to leave the site. This kind of information is e.g. brief but informative product names, quality product images, information on options of color, size, etc., clear pricing, indicators for new arrivals and sales, information on stock levels, etc.

2.3.2 Visual attention

The most common way for users to view a website is to start from the top and move downwards in sequences where the visual attention moves from left to right. The top left area of a website is therefore the most likely place on a website where users will start to read and view content. This way of viewing a website is referred to as the F-

shaped viewing pattern (see Figure 7) as the visual fixations form the shape of the letter F; this pattern mostly applies for websites with content in the form of text since pictures are not viewed in the same way. The main reason why users tend to view website content in this way is that they try to be as efficient as possible in their task and they are not interested enough to engage in reading content word for word. Other common visual habits of website users are that elements on the left side of a website tend to get more attention than ones on the right and that users are less likely to pay attention to any information that is located "below the fold" and needs scrolling to be seen by the user. According to research done by Nielsen Norman Group in 2010 as much as 80 % of the users visual viewing time was spent above the fold on websites but a similar research by Nielsen Norman Group conducted in 2018 shows that the amount of viewing time spent above the fold has decreased significantly as it now was only 57 % (Bergström, J.R. & Schall, A. 2014 p.27-38; CXL 2013; Fessenden, T. 2018, Pernice, K. 2017).

Figure 7: The F-shaped viewing pattern (Pernice, K. 2017)

The type and size of different elements and objects on a website also matter when it comes to attracting the visual attention of users scanning through and viewing the site. Bigger elements communicate importance to the viewer and motivates him or her to pay that element visual attention earlier than to other smaller ones. Pictures naturally attract visual attention better than plain text so to use pictures and photos in website design

near other content that is wanted by companies to be noticed is motivated. Pictures of humans and especially human faces are effective in obtaining visual attention since people naturally respond to pictures of other people; it also matters where the human in a picture is looking since the object or content the person in the picture is looking at very likely will be the next destination for the user's visual attention as well. The use of pictures may also however have a negative effect as they can take the viewer's attention away from the information that he or she is trying to find (Bergström, J.R. & Schall, A. 2014 p.27-38; CXL 2013).

2.4 Online user experience

User experience is the experience a product or system generates for the person using or interacting with it in a real-life situation. User experience is all about how it works, how it feels, how easy or hard it is to use, etc. and not at all about what a product or system does for the user or what features it may have. In the development of new products and systems a lot of attention is turned internally to what it can do better than others in terms of attributes and functions and not that much, to the other side of it, i.e. how does it really work then externally when users interact with and use the product or system (Garrett, J.J 2011 p.4-7). With this said, an online user experience can be defined as being the experience created by a user interacting with an online system like e.g. a website; in other words, how a person felt and acted throughout being in contact with a website. In his book *The Elements of User Experience: User-Centered Design for the Web and Beyond* (2011 p.9-11) author Jesse J. Garrett states that user experience is even more crucial for online systems like websites than it is for other types of products. This is because websites are technically self-service products where the user faces the system relying solely on own experience and judgement without the help of any user manuals or other user training in advance. Garrett also points out that website users tend to feel foolish and blame themselves for doing something wrong, not understanding or not being focused enough after encountering a bad user experience where the website did not work as they anticipated. However, according to Garrett it is most certainly not the users' fault that they have a bad user experience on a website or other online platform and feel foolish using something that does not work accordingly.

When it comes to online user experience the customers' expectations are high since the reference point often lies with the experience of shopping online at e.g. Amazon or Alibaba whose websites have high usability and offers great assortment, low-costs and fast deliveries. This raises the customers' expectations against all online retailers that battle for market share in an environment where the customers spend much more time on other sites than they do on any single retailer's site (Flaherty, K. & Kaley, A. 2018). In a large research regarding customer expectations on user experience in e-commerce, done by the Nielsen Norman Group in 2018, six major themes of customer expectations on user experience in e-commerce were identified after analyzing and comparing the results to their previous studies. These six themes of changed customer expectations are:

Convenience

In online user experience convenience means that the users' nowadays may interact with e.g. an e-commerce website whenever and wherever they want under their own conditions using any preferred channel or device. For so called click-and-mortar companies it is also important to remember that the online and physical user experiences should not be separated since customers expect the convenience of having these two combined into one user experience (Flaherty, K. & Kaley, A. 2018).

Speed

Both the experience of executing e.g. a shopping experience online and getting the ordered products delivered is expected by customers to be fast. Quick and easy processes requiring as little clicks and effort as possible to complete together with a fast delivery of purchases is a combination needed for differentiating with speed in online user experience (Flaherty, K. & Kaley, A. 2018).

Assurance

Customers highly value their privacy and security in online user experiences, and it is important for any actor online to ensure and communicate data security, trust and security towards the user along their whole process or experience online. On e.g. an e-commerce website the customers expect their data to be safe and protected at all time and will not accept anything else when it comes to assurances online (Flaherty, K. & Kaley, A. 2018).

Accuracy

Today's online consumers expect to be given precise and accurate information regarding e.g. geolocation, stock levels, status prompts and messages, time schedules, shipping, pricing, reviews, etc. Poor and inaccurate information is not appreciated and will most likely result in skepticism from customers towards the site or service; if the information is not accurate and precise it is better to not show it at all to the users (Flaherty, K. & Kaley, A. 2018).

Options

When it comes down to things like e.g. deliveries, payments and customer service within e-commerce customers demand options and flexibility so that they can interact with the site and create a user experience that suits them and their significant wants and needs. It is important to offer the users different ways to have their goods delivered, multiple methods of paying for the goods and to have in place a set of different channels for customers to get help, service and make contact (Flaherty, K. & Kaley, A. 2018).

Experience

The users' expectations towards what kind of an experience they may encounter when interacting with an e-commerce website are growing all the time and what felt amazing and breathtaking yesterday is not enough anymore today. Online consumers want to get surprised and have their expectations outmatched by e.g. personalized packaging and inspiring content (Flaherty, K. & Kaley, A. 2018).

2.4.1 Website usability

Usability is an attribute of quality that evaluates how easy to use a user interface of e.g. a website platform is for its users; on the other hand, usability is also the term used during the design phase of e.g. a new website when considering different methods in order to refine the site and make it easier to use. The attribute of usability can be described by its five components of quality i.e.:

1) **Learnability**; Ease of task completion at first time of encountering the website

2) **Efficiency**; Swiftness of task completion after learning the website's design
3) **Memorability**; The know-how to use the site again after not using it for a while
4) **Errors**; The amount and severity of errors made and ease of reclaiming control
5) **Satisfaction**; Level of how enjoyable and satisfactory it is to use the website

If a website is perceived complicated to use, read or navigate visitors will choose to leave for the reason of poor usability; instead of staying and trying to figure out how the site operates they will simply leave and find an alternative site that delivers on usability. Usability does not however on its own determine if a website is useful since usability only assesses the ease-of-use and not whether the websites features are functioning or not. Utility is the other attribute of quality that together with usability settles if a website is useful or not; i.e. serves some user need. Utility points out the functionality or in other words if a website does what it needs to do for its users; there is no value in a website that is very easy to use but does not execute the things it should and not either if it does execute but its interface is too hard to use. One of the most essential ways of ensuring good usability on a website is to conduct user testing where a group of possible users or customers are observed when independently performing given tasks on the website; simply letting the real users of the site show its level of usability. From the observation data it can then be seen what the users did, what turned out well and what bad, what problems occurred, etc. all of which helps to make needed changes to the interface design. Usability should be focused on and tested throughout the whole development and design process of a website in order to ensure a great UX for the users, but it is as important to test the usability again after the final version has been implemented since slender usability issues may occur in the course of implementation (Nielsen, J. 2012a).

2.4.2 Levels to success in online UX

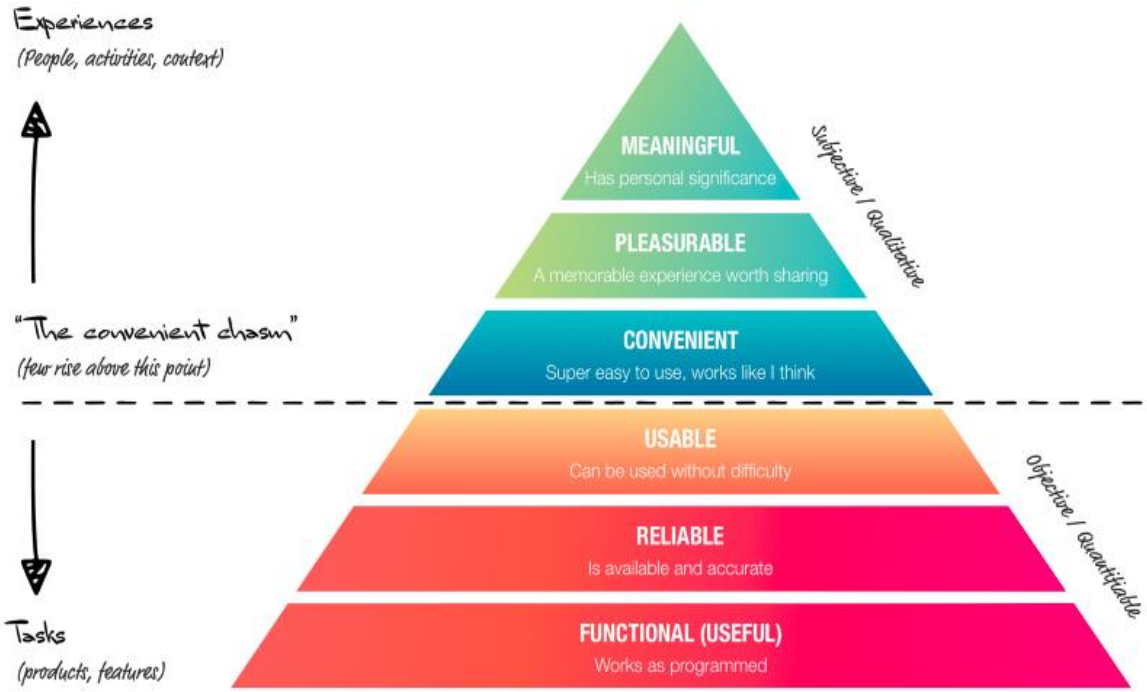

Figure 8: The UX Pyramid (Source: Ralph, B. 2017)

As user experience is a very wide and subjective matter it can be quite challenging for companies and other actors to come upon methods of how to measure, track or benchmark an UX's prosperity. The UX Pyramid (Figure 8) that is based on Maslow's hierarchy of needs with essentials at the bottom and more enhanced elements of UX at the top is one good example of a framework or tool for the grouping of and follow up on UX development and effort. The pyramid is divided into two parts each consisting of three steps or levels; the three levels at the bottom are more measurable and focuses on features and the user's capability to perform a preferred task when the three at the upper half are more abstract and subjective focusing on the context of how the users feel when experiencing a product or service like e.g. a website. A short description of all six levels and their specific qualities follows below:

1) **Functional** – The emphasis at first is to ensure that the website really works as it should and as it was programmed to do; aspects to checkmark on the functional level are e.g. that the website is useful in some way for its users, all its key features are functioning, no faults or errors occur, it uses up-to-date technology, it is accessible, etc.

2) **Reliable** – The second level focuses on availability and accuracy of the website; are loading times reasonable, can it be used on different devices, is the data reliable and is the content accurate and up-to-date and are all questions that need to be answered positively in order to move on?

3) **Usable** – At this stage the question is; Can the website be used without difficulties and does the users easily find what they are looking for without getting distracted or confused? This level of usability is achieved if the website meets basic UX rules and does not depend on user manuals or frequent help prompts, hence the user learns how the site functions in a short period of time after entering.

4) **Convenient** – For a website to achieve this level in the UX Pyramid it is not anymore enough if the users like to use the site, no, at this stage the users want to use the site and actively seeks for situations in order to use it more frequently because the site is very easy to use and it works exactly how the users want it to.

5) **Pleasurable** – This level can be seen to be achieved when users start to enjoy a website's experience so much that they invest themselves into it by taking it on as a daily habit and start promoting and sharing it with their social network.

6) **Meaningful** – At the highest level a website and its UX have a significant social or personal meaning and therefore becomes loved by its users.

In the UX Pyramid there is a space between the bottom three and the upper three levels called "*The convenient chasm*" which past not many either get or even want to proceed. Many companies see the first three levels as enough value for them since these levels practically mean that the website works as it should and can be used without any difficulties by its users. By stopping here companies however close themselves outside of achieving further valuable results online such as e.g. increased customer spending and customer loyalty (Ralph, B. 2017; Korkishko, I. 2018).

3 METHOD AND EMPIRICAL CONTEXT

Since the objective of this study is to mainly investigate the user experience on the Byggmax.fi website to gain insights on usability and find out as well as understand possible issues regarding it, the research in this thesis is conducted using a mix of both quantitative and qualitative methods; this approach ensures that the possible issues and development areas concerning usability are not only discovered but also reasoned and more deeply understood. In this thesis the following methods are used for data collection and data analysis:

1) Pre-session respondent survey for background questions and demographics using the free online survey tool from SurveyMonkey for both collecting and analyzing the data (quantitative)
2) Two tasked eye-tracking sessions using the Tobii T120 device to collect data on visual behavior, usability and user experience; analyzing the data using the Tobii Studio 3.4.8 eye-tracking software (quantitative & qualitative)
3) Open post-session respondent interviews using the website as stimuli for reflections and feedback from every participant on the tasks, the user experience, the website and their own actions; recorded, transcribed and thematically analyzed (qualitative)

Even if there are many types of research methods the qualitative and quantitative approach are the two main ways of approaching a research according to C.R. Kothari (2004, p.5). Qualitative or quantitative approach always applies for both the data collection and for the analysis procedure; this means that quantitatively collected data must be analyzed using a quantitative analysis procedure and qualitatively collected data shall in its turn again be analyzed using qualitative procedures (Saunders et al. 2009 p.151). Structured research, i.e. the same setting for every respondent, that focuses on gathering numerical data like quantities or amounts and expresses results of e.g. surveys in a statistical manner using graphs and charts is called quantitative research. The quantitative research approach can additionally be broken down to the simulation and experimental research methods. In an experimental approach the researcher has got more control regarding the research environment and the participants than in a standard survey or in-

ferred research; manipulated variables are also used in experimental research to find out if and how they are impacting other variables of the study. A simulation research includes building an imitated research environment to generate credible information for the data collection. The simulation approach is usually used when the researcher wants to conduct observation of a specific system or subject in a controlled setting. When a researcher wants to study subjects as quality, behavior, attitude, pictures, movies or other non-numerical phenomena a qualitative research approach is used. Qualitative research methods are e.g. different types of interviews, focus groups and observations. Analysis of qualitative data makes it possible to better understand why people behave, think and act in a certain way and what are the motives behind some behavior or attitude towards e.g. a subject, product or institution. To summarize, quantitative research obtains significance from numerical data that is in a standardized form after the collection of it and furtherly analyzed using statistics, charts and diagrams. Qualitative research again is based on the interpretation of non-structured complex data usually in form of words that after collection must be re-structured, summarized or categorized into some framework concept to make the data meaningful (Kothari 2005 p. 3-5; Saunders et al. 2009 p.151 & 482-484).

Joseph E. McGrath presents in his chapter *Methodology Matters: Doing research in the behavioral and social sciences* of the book *Readings in Human-Computer Interaction: Towards the year 2000* (1995 p. 155-159) four different research strategies for evaluating a product or subject; field strategies, experimental strategies, respondent strategies and theoretical strategies. The field strategy can be carried out as a field study where the researcher mainly observes something in its natural form without interfering or as a field experiment where the setting is very similar to the field study but here the researcher may intervene or manipulate with some part of the setting in the quest of getting more precise results. Experimental research strategies like laboratory experiment and experimental simulation are characterized by the researcher purposely setting up a controlled test environment, that fits the scope of the study, and then having participants to engage with the setting; this strategy develops precise results regarding the specific setting but can be seen to sometimes lack a context of reality and also the possibility to generalize the findings. The respondent strategy refers to the methods of collecting opinions on something from respondents in a setting where the environment is irrelevant

and generalizability high; these methods are e.g. surveys, questionnaires and in some cases also interviews. Non-empirical research, i.e. a research involving no participants whose opinions, behavior, actions or attitudes are being researched, practices theoretical strategies like formal theory investigating and comparing theories or computer simulation studying closed computer systems (McGrath 1995 p.157-159).

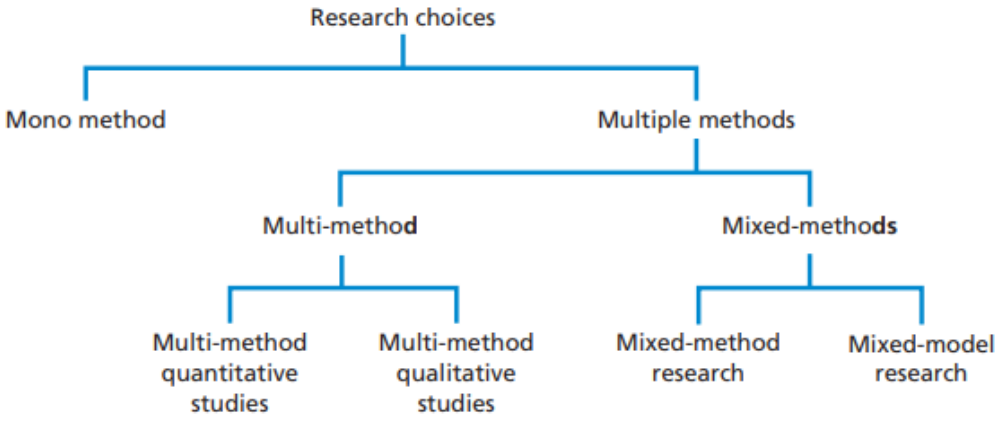

Figure 9: Research choices visualized by Saunders et al. (2009 p.152)

When considering how to answer research questions at hand in the best possible way to get as good results and answers as possible a researcher must make choices of research (Figure 8). The first choice that must be made is to choose between using a mono method, i.e. a single qualitative or quantitative data collection method with a single matching analysis method, or multiple methods which means using several data collection and analysis methods together. The multiple methods approach furtherly requires another choice to be made by a researcher and that is the choice between conducting a multi-method study or conducting a study using mixed-methods. The difference here is that the multi-method approach includes using more than one of either qualitative or quantitative techniques, without mixing the two, when again the mixed-methods approach uses both qualitative and quantitative techniques within the same study. The mixed-methods approach can still then be divided into a mixed-method research, i.e. mixing qualitative and quantitative techniques in data collection but analyzing qualitative data qualitatively and vice versa, and a mixed-model research where the analyzing also may be mixed, i.e. converting quantitative data to be qualitatively analyzed and vice versa. The use of mixed methods of both qualitative and quantitative techniques within a sin-

gle study is favorable in business research since it elevates the chances of validly answering research questions and as well makes the findings more reliable, trustworthy and comprehensive (Saunders et al. 2009 p. 151-153).

Considering the information presented above in this chapter it can be said that an experimental strategy with a mixed-method research approach of both quantitative and qualitative techniques is used in this thesis for data collection and data analysis. The setting of a tasked eye-tracking session in a test laboratory makes the research strategy of this thesis an experimental one when again the use of both qualitative and quantitative data collection techniques without mixing the analyzing procedures indicates the research choice to be a mixed-method research. The reason for choosing this approach is that qualitative open respondent interviews will provide help and depth in understanding why a specific test person acted or behaved in a certain way during the tasked session. This qualitative data can then be compared to the quantitative data, obtained from the eye-tracking software, to make credible conclusions and answer research questions.

3.1 Eye-tracking as a research method

Even though eye-tracking feels to be a very modern way of research the truth is that the technique of investigating eye movement goes back all the way to the year of 1879 when a French doctor, Louis Emile Javal, who was a specialist of the human eye discovered through observation that, when reading, a human does not progress fluently in the text but rather occasionally stops and then again rapidly proceeds across multiple words. Inspired by Javal's discovery psychologist Edmund Huey built the first ever eye-tracking device in 1908; the device was very inconvenient and uncomfortable for the user since it required the test person to put on a type of lenses that had a pointer attached that helped Huey track the test persons eye movements. In the 1940's the first actual recordings of eye-movement with cameras were successful and the development of eye-tracking research continued quite steady all the way to the early 1970's, making it more accessible all the time for researchers, but at the same time still being uncomfortable for test persons that were strapped to head mounts or biting bars for stability resulting in unauthentic test environments and therefore also unreliable results. In the late 1970's and early 1980's eye-tracking became more comfortable for users by separating eye

movement from head movement which generated more accurate and reliable results. The eye-trackers based on human-computer interaction came in the late 1980's and early 1990's when computers became powerful enough to process the data in real time. Eye-tracking as the research method we have it today began shaping in late 1990's and early 2000's when it was made more accessible and usable for wider communities through technology development (Leggett D. 2010; EyeSee 2014; Bergström, J.R. & Schall, A. 2014 p.9-14).

The method providing understanding of visual attention like e.g. at what time and where a person looks on something, e.g. an advertisement or a website, for how long they look at it and how their eye movement proceeds from start to finish is called eye-tracking. This research method is mostly used in marketing, cognitive psychology and other research within the field of human-computer interaction (Bergström, J.R. & Schall, A. 2014 p.3).

Tobii (2018), a leading company within the field, defines eye-tracking as: *"the process of measuring eye movements to determine where a person is looking, what they are looking at, and for how long their gaze is in a particular spot"*. People use their eyes for both learning and making decisions and that is why researchers, companies and institutions use eye-tracking as a method to objectively investigate people's behavior to get understanding through deeper insights into the human visual attention and visual behavior. As a research method eye-tracking can be used e.g. to study customer behavior and decision-making processes or within the field of marketing to study product placement or design of packages and advertisements. Eye-tracking reflects authentic behavior and shows what the respondents' visual attention was drawn to and what they visually disregarded. Eye-tracking is also widely used in studying the user experience of different subjects such as websites and operation systems; eye-tracking research can e.g. reveal problems concerning usability and design that has not been discovered or thought of during the development of the studied site or system. Regarding user experience there is not any better method available for testing it than to use eye-tracking and really see the user experience on e.g. a website through the eyes of the person interacting with it (Tobii 2018).

3.1.1 Usability testing

To test a system or a product by observing real user interactions and gathering feedback on user experience from the users is called usability testing and it provides valuable and accurate results about the design features and the ease of use of a specific product or system; therefore usability testing helps the testing party to ensure certainty of that the product or system delivers what it has been developed for or to make detailed corrections to it if needed. In practice, usability is normally tested by a researcher observing a test person using a product or a system that is being usability tested and at the same time thinking out loud and proposing improvements regarding the user experience. Lately though the use of eye-tracking has been implemented as an alternative method to test usability and user experience since as a method it is non-interfering and individual for test persons and an eye-tracker reveals accurately for researchers where the test persons look and how the product or system design and usability is perceived. Using eye-tracking as a method for usability testing is especially useful e.g. for the development of website design and user experience (Bergström, J.R. & Schall, A. 2014 p.49-50).

Wong W., Bartles, M. & Chrobot, N. from Tobii Technology in Falls Church, USA, emphasizes, in chapter eight of the book *Eye Tracking in User Experience Design* by Bergström, J.R. & Schall, A. (2014), the justification of using eye-tracking when studying and investigating both platform design and user experience of e-commerce websites. New possibilities and unknown obstacles may occur using an eye-tracker in the process from when a potential customer enters the site and sees the front page to the point where he or she has gone through the checkout step and is about to become a paying customer. Unexpected visual behavior, effect of interactive elements, missed opportunities, navigation patterns and design success or flaws are some of the things eye-tracking can come upon concerning usability and user experience of e-commerce websites. A website running e-commerce must be visually attractive and easy-going for the user at the same time and therefore eye-tracking as a method is out most convenient since it merges recording of users' visual behavior together with the vital result indicators of e-commerce; i.e. sales growth, loyalty and user satisfaction (Bergström, J.R. & Schall, A. 2014 p.187-188).

According to Holmqvist et al. (2011) qualitative usability testing can be performed in three different ways with the help of eye-tracking to confirm a good user experience or find out possible usability problems. These ways are briefly presented below:

1) **Thinking aloud method**

   In this method the respondent is instructed to think out loud at the same time as interacting in the eye-tracking session. The benefits of this approach are that there is no need for double data collection and that verbal data is collected simultaneously with the actual interaction with the product or system being usability tested. On the other hand, the eye-tracking data and task performance may decrease in quality since the test person is not concentrating solely on the eye-tracking session when thinking aloud at the same time making the test session slower.

2) **Retrospective thinking with gaze replays**

   In this method the respondent first completes the eye-tracking session without any interruptions and then recalls on own actions and behavior together with the researcher by looking at a replay of the session afterwards. This method ensures good data quality since the sessions are not slowed down or interrupted by thinking aloud. The downside is the need for two sessions of data collection and the fact that respondents may forget valuable insights that occurred in their mind during the performance of the session.

3) **Task performance and freely recalling content in post-test interview**

   In this method the respondent first completes the tasked eye-tracking session tasks as instructed in advance by the researcher without any interruptions and after the session the respondent freely discusses the content of the session by answering questions in a post-test interview where the researcher asks open questions or questions linked to stimuli material like pictures, videos or snapshots from the respondent's own session. The upsides and downsides of this method are quite like the ones in the retrospective thinking method described previously.

Both qualitative and quantitative data can be collected in a study testing usability. Qualitative data builds on observations and interviews revealing pain points and ease of use concerning design when quantitative data, like e.g. measures on completion rate and time to task completion, again refers to how easy or troublesome it was to complete the assigned tasks. Regarding judgement of usability the significant distinction is that qualitative data provides a direct evaluation on usability when the quantitative data again does it indirectly. This means that qualitative data answers the question of "why?" as it directly denotes specific issues and insights on the user experience for the researcher and so forth may solve unknown problems and give incentives towards modifications. Quantitative data in usability testing is solely numbers and answers questions like e.g. "How many?", "How long?" or "How much?" and therefore quantitative data does not directly pinpoint a specific issue in the user experience or suggest what to do differently going forward but on the other hand it does help the researcher to put numbers on e.g. how many errors were made, how long tasks took to complete or how satisfied the participants were with the tested product or design. For collecting qualitative data regarding usability only a few (5-8) participants are needed, and the test setting can be flexible and set up to serve the needs of the research, quantitative data collection in comparison needs many (>30) respondents and a very controlled research setting. Often researchers must use qualitative methods to complement quantitative data in usability studies to find out what the real issues are (Budiu, R. 2017).

3.1.2 The device

An eye-tracker is a device that makes it possible to record, observe and analyze human visual behavior by tracking the movement and positioning of a respondent's eyes with the help of infrared light projectors creating a reflection and high-resolution cameras obtaining the reflections from the eyes. The eye-tracking device then uses smart algorithms to calculate and determine accurate eye movement and visual fixations several times per second; all recorded data can then be replayed, visualized and analyzed by an eye-tracking software. Nowadays there are numerous different eye-tracking devices available but generally they can be divided into three primary categories; i.e. screen based, wearable and webcam devices. Screen based eye-trackers are independent devices with built in eye-tracking technology and are very similar in appearance to normal

stationary or portable computers, wearable eye-trackers are e.g. glasses or virtual reality goggles with integrated eye-trackers and webcam devices are separate devices that can be attached to any stationary computer or laptop. The characteristics of the research and its goals determines which type of eye-tracking device is the most suitable; e.g. web-sites, pictures or other screen based stimuli naturally suits best for a screen based eye-tracker when again portable eye-tracking glasses suits best for real life experiments out in the field to study visual behavior in real life environments (Bergström, J.R. & Schall, A. 2014 p.3-5; Tobii 2018).

Figure 10: A screen-based Tobii Technologies eye-tracking device in use (Bergström, J.R. & Schall, A. 2014 p.4)

3.1.3 Eye-tracking data output

The main elements for analysis that an eye-tracker gives insight in regarding visual behavior are location, duration and movement. The element of location means that the eye-tracker can make a map of all spots on e.g. a picture, form or website where the respondent's eyes were looking; these locations are called fixations. These fixations are very brief and are recorded always when the respondent looks at something for about 100 to 600 milliseconds; the downside of these mapped brief fixations is that one cannot really say for sure if the respondent looked at something intentionally and saw it or just rested his or her eyes for a while without consciously looking at anything. Location fixations are quantifiable data and only tells where and what the respondents looked at but not why they looked there. The eye-tracker also registers duration of fixations in time often communicated in milliseconds since also the durations usually are very short. This

therefore means that a researcher gets to know not only what and where a respondent looked but also for how long he or she looked at a particular element or location; to analyze what the durations mean is however very hard since the data is quantitative and does not tell if the respondent spent a long time looking at something e.g. because there was a problem or because it was particularly interesting. The last main output element is movement as the eye-tracker also records in which order the respondent's eye gaze moved from start to finish; this element provides great insight in what elements attract visual attention and in which order on a specific stimulus like a picture, form or website. To understand these quantifiable outputs a researcher often must evaluate the location, duration and movement data also by using other methods of analysis (Bergström, J.R. & Schall, A. 2014 p.7-8; Tobii 2018). Using an eye-tracking software a researcher will be able to take advantage of visual outputs like areas of interest (AOI), heat maps, gaze plots and gaze replays; these are described below:

AOI's

Either before or after the data collection with an eye-tracker a researcher can draw up certain AOI's on e.g. a website that are considered interesting for further analysis from the perspective that they specifically serve the purpose of the study. The disadvantage of AOI's are that they are quite time consuming as an analysis method and they do not function together with dynamic stimulus like e.g. videos. AOI's are made in the eye-tracking software by shaping boxes around elements or areas, and naming them for easier follow up, the eye-tracker then records and keeps count on how many looked at the area, how often and for how long. It may be of interest to know perhaps how many participants first looked at a certain element and what individual element was looked at for the longest duration; AOI's are therefore quantitative data output (Bergström, J.R. & Schall, A. 2014 p.57; Pernice, K. & Nielsen, J. 2009 p.138).

Heat maps

A heatmap clearly visualizes with different colors the areas of a picture, website or other stimulus that a single or many respondents looked at and for how long or in comparison failed to see. Heatmaps are not that valuable data at their own but are good for getting an overview of the results and helps a researcher to define the areas to further analyze and investigate. The advantages of heatmaps are that they are visually explanatory

and easily understood and can be used for output on both single and multiple respondents but on the other hand they do not show any sequence of fixations and does not take dynamic elements into account (this may differ on latest eye-tracking technologies) (Bergström, J.R. & Schall, A. 2014 p.61-64; Pernice, K. & Nielsen, J. 2009 p.118-124).

Figure 11: An example of a website heatmap (Pernice, K. & Nielsen, J. 2009 p.121)

Gaze plots

A gaze plot gathers all eye-movement and fixations of a single respondent on one static sheet showing all fixation locations as dots and their sequence as a number inside the dot with the logic that number 1 means that location where the respondent looked first and number 2 where the respondent looked after that and so on. The dots in a gaze plot vary in size and the bigger the dot is representing longer duration of fixation; all dots are also connected by lines to visualize the pathway of the eye gazes. A gaze plot can be hard to read as it shows all single fixations with an own dot and covers up the view, but it is possible to make the dots partially transparent or only show e.g. the first 20 dots; clusters of dots or dots overlapping each other tells that the respondent was interested in that specific area. Analyzing gaze plots can take up a lot of time if there are many respondents since a researcher only can view a gaze plot of one respondent at a time. Gaze plots does not either work together with interactive elements like e.g. pop-ups,

videos or drop-down features on a website (Bergström, J.R. & Schall, A. 2014 p.64-67; Pernice, K. & Nielsen, J. 2009 p.117-118).

Gaze replays

The method of watching a replay of a single respondent's eye-tracking session afterwards in an analysis software is called gaze replay. In a gaze replay the eye-movement of the respondent is visualized by a dot moving on top of the shown material; the gaze replay is a very valuable and accurate analysis method since it can be modified in speed and is often slowed down when analyzed to really see all single eye-movements in the exact order they occurred. This method is valuable for showing issues of usability that came up in task performance or when researching visual behavior on e.g. dynamic screen-based elements. Interpreting gaze replays is a qualitative analysis method of eye-tracking data providing interesting insights in eye-movement and visual behavior; however, analyzing gaze replays in slow motion is a very time-consuming task for a researcher (Bergström, J.R. & Schall, A. 2014 p.212; Pernice, K. & Nielsen, J. 2009 p.116-117).

According to Pernice, K. & Nielsen, J. (2009) all these different outputs for analyzing eye-tracker data has their pro's and con's and that is why it is important to use several of them when analyzing the collected data so that the outcome of the research is as accurate, reliable and valid as possible.

3.2 Sample group

The method used for sampling in this research is a mix of two non-probability techniques called purposive sampling and self-selection sampling. When a researcher deliberately uses own judgement to choose participants that are known to both fit the target group and serve the objective and research questions of the study the method is called purposive sampling; this technique is usually used in case studies where the sample group is quite small but especially informative. Self-selection sampling takes place when a researcher makes it know to the public that there is a need for participants for a research of some kind or directly asks individuals to participate. The individuals then make their own decision if they wish to participate in the research or not and the re-

search is then conducted solely on those who choose to take part. The ones who choose to give up some of their personal time to self-select often take part in the research because they feel they have opinions on, are interested in or somehow can relate to the research questions, topic or purpose of the study (Saunders et al. 2009 p. 213-241).

Since the commissioning party wanted to have respondents that fit their target group of DIY minded people aged over 25 years the participants were chosen purposively from both the author's own and the author's colleagues' personal and professional networks. The chosen persons were contacted individually, told briefly about the research being done and asked for their willingness to take part in the study; as an incentive Byggmax wanted to hand out a gift card worth 50 € to everyone choosing to participate and thereby contributing to the study.

The aim regarding sample size for this study was to have 15 respondents that all take part in the three phases of the research that were listed in the beginning of chapter three; additionally, the target for the actual eye-tracking sessions was to get at least 13 recordings out of 15 with high enough accuracy that the collected data reliably could be used for analyzing. According to Jakob Nielsen from Nielsen Norman Group (2000 & 2012b) already five participants is enough for a study where the purpose is to find most issues regarding usability on e.g. a website; five participants will reveal around 85 % of the issues and using up to 15 participants will most likely reveal 100 % of the usability issues as shown in Figure 12 beneath.

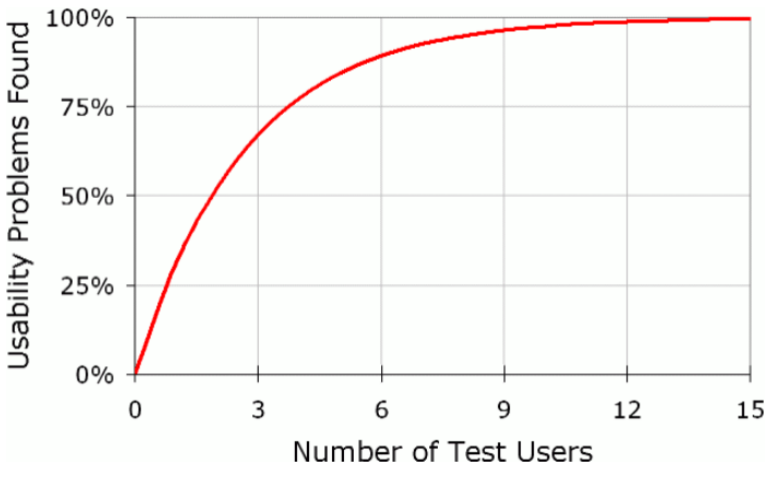

Figure 12: Number of participants vs. issues found (Nielsen, J. 2000)

For this thesis I chose to use 15 respondents because the purpose was not only to test the usability and the UX of the re-designed website but to do it in combination with studying the respondents' visual behavior through tasked eye-tracking sessions at the same time; five respondents would have been too small of a sample size for generating reliable gaze plots and heatmaps regarding the respondents' visual behavior.

The demographics and background variables of the sample group used in this study is shown in the tables below using statistics obtained from the pre-session respondent survey conducted using the SurveyMonkey free online survey tool. Out of 15 respondents eleven were males and four females, 73,33 % of the respondents were between 25-40 years old and only one of the 15 people in the sample group had never visited a physical Byggmax store. The respondents were in general quite experienced web shop users since only said that they had only some experience from web shops when again 4/15 bought from web shops a few times per year, 7/15 bought from web shops monthly and 3/15 said that they buy several times a month from web shops. Regarding the respondent's familiarity of Byggmax website 60 % said that the site was either completely or quite unknown to them and 40 % were either quite or very familiar with the site from before. The respondent's type of accommodation was also asked in the survey; 10/15 lived in a flat and 5/15 lived in a single or semidetached house.

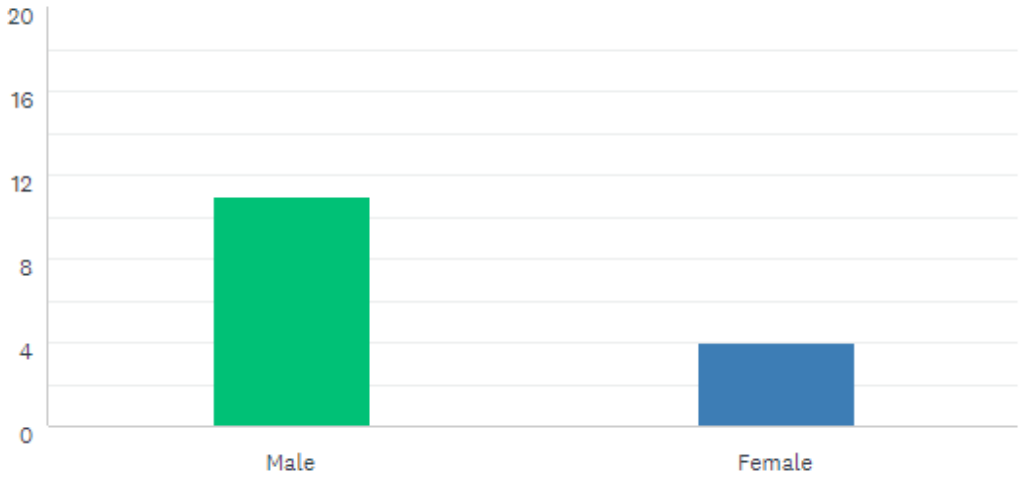

Table 1: Gender distribution of respondents

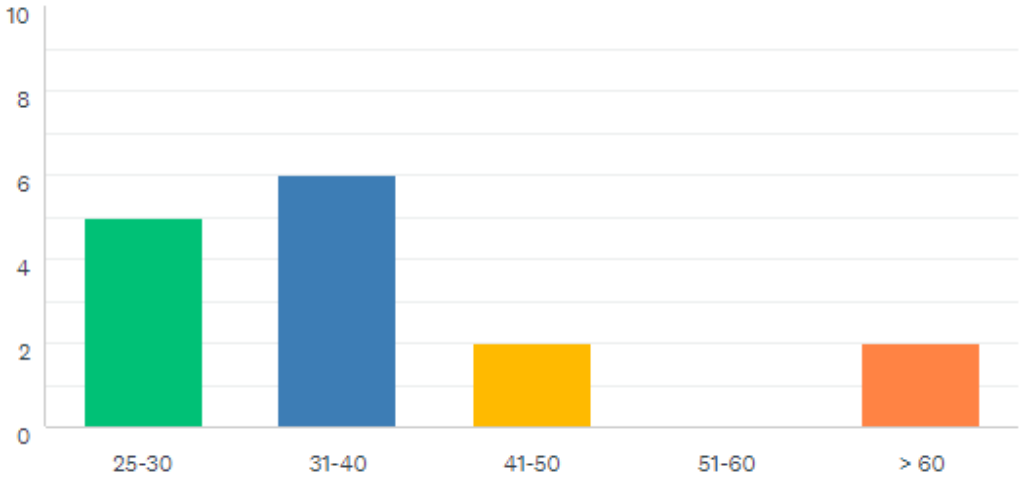

Table 2: Age grouping of respondents

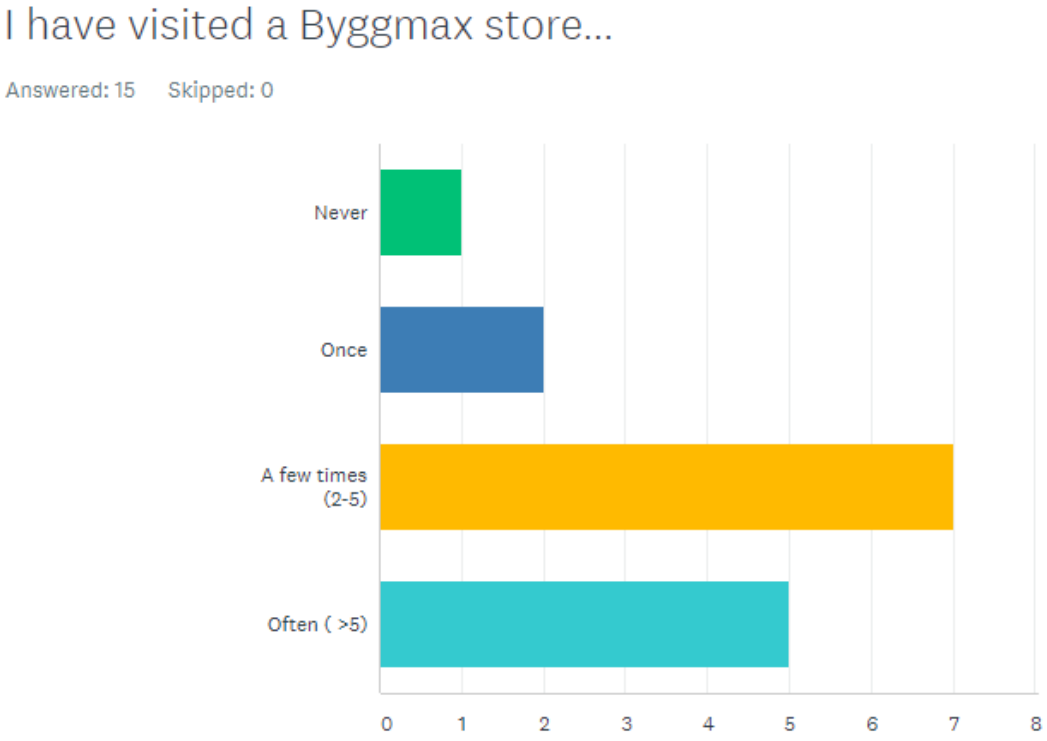

Table 3: Respondents' visits to Byggmax physical stores

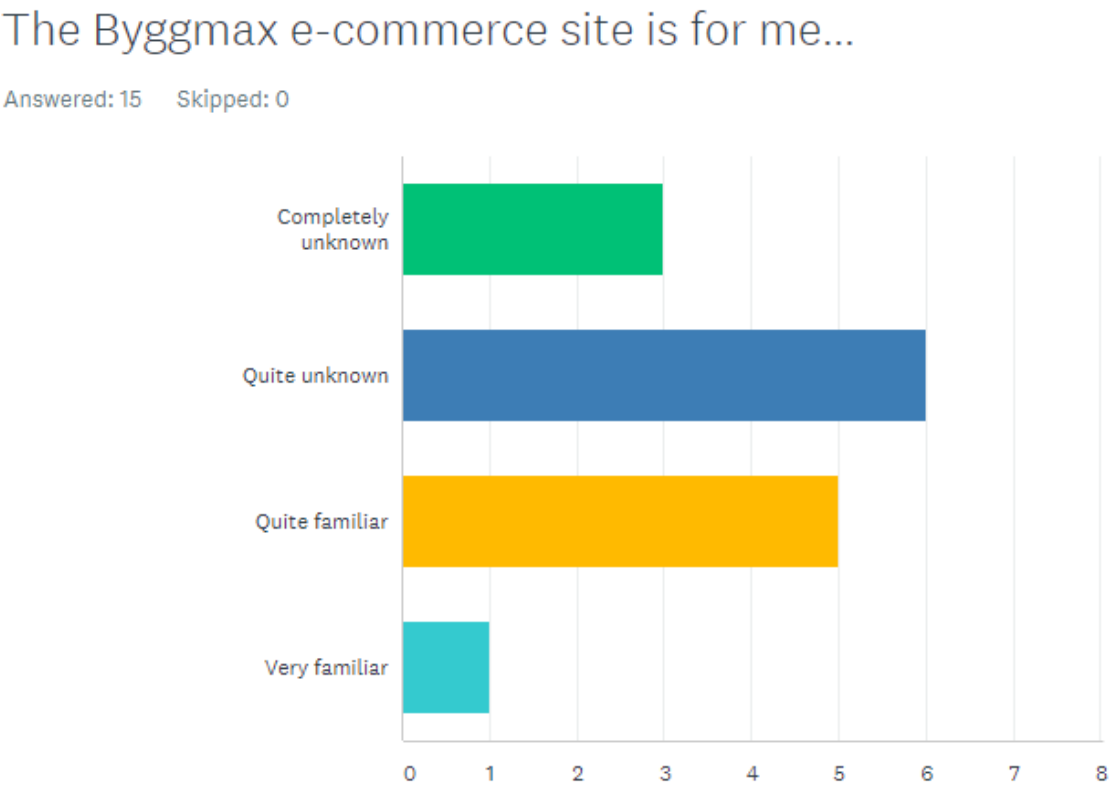

Table 4: Respondents' familiarity with the Byggmax site

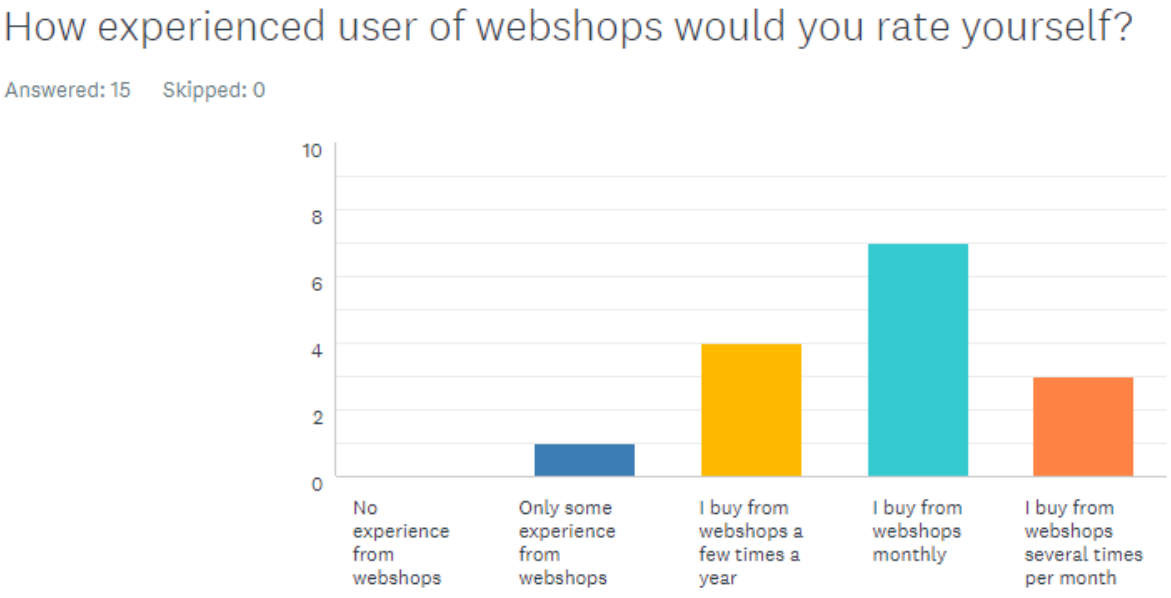

Table 5: Respondents' web shop experience

To keep the data in order and make the data analysis easier all respondents were tagged with a respondent ID at the start of the pre-session survey using the system shown be-

low; this ID followed through the whole research session and was used to also tag both the respondents' eye-tracking and interview recordings:

- 1st respondent = R_01
- 2nd respondent = R_02
- 3rd respondent = R_03
- 4th respondent = R_04
- 5th respondent = R_05
- …..
- 15th respondent = R_15

3.3 Research setting

The data collection for this research was conducted in the Eye-tracking laboratory at Arcada – University of Applied Sciences in a time period of one week; from Sunday the 3rd of February to Sunday the 10th of February 2019. The number of participants per day during the week varied as much as from 0-7 as it turned out to be quite challenging to arrange the sessions evenly throughout the week since the respondents had very different personal schedules that needed to be considered. The session setting regarding the data collection was the same for all respondents; it lasted from 30-90 minutes each and followed through as described below:

1) Firstly, the respondent was welcomed to the facilities of Arcada and thanked on behalf of Byggmax and me as the researcher for taking the time to participate and contribute. The respondent was then introduced to the setting and the different phases of the session ahead; after the welcoming and introduction the respondent was asked to fill in the pre-session survey on a provided laptop.

2) After the pre-session survey was completed the respondent was asked to take a seat in the chair facing the eye-tracker screen. When seated the respondent was briefly informed about the eye-tracker, how it works and how to act during the time of the recordings; i.e. to avoid moving around in the chair or leaning forward or backwards during the recordings.

3) When the respondent had been introduced to the eye-tracker device it was time to get acquainted with task number one. The task was given to the respondent in written format on a piece of paper and after the respondent had read the task it was also verbally discussed to ensure that the task had been understood. The eye-tracker was then finally calibrated according to the respondent's eyes where after the performance of "Task 1" started.

4) The same approach as described previously was taken with "Task 2" after "Task 1" was completed; the eye-tracker was also re-calibrated before starting the recording of "Task 2". Both tasks are described in detail in section 3.3.1 below.

5) After the completion of "Task 2" the respondent was shown a bit of how the eye-tracker shows output in form of heatmaps, clusters and gaze plots from their specific recording; this was found very interesting and highly appreciated by all respondents.

6) In the final phase of the research session the respondent was interviewed in an open and relaxed way about the recent experience and asked to recall possible issues or other specific positive or negative things that came into mind; the website was used as stimuli on a laptop during the interviews to help the respondent better recall things. All interviews were recorded with the permission of the respondents and they lasted between 7-34 minutes each with an average time of 17 minutes and 55 seconds through 15 interviews. The supporting questions used in the interview are presented in *Appendix 3*.

7) Before leaving the respondent was thanked ones again for taking the time to participate and contribute to the research; the thank you gesture from Byggmax, a gift card valued 50 €, was also handed over at this stage to the respondent.

3.3.1 Information on the tasks

Both tasks were presented to the respondents in Finnish since the research was conducted on Byggmax' Finnish website using Finnish customers; the task descriptions presented below have therefore been translated from Finnish into English. The original task instructions given in Finnish to the respondents are found in *Appendix 2*.

TASK 1

The first task was a need-based task where the customer uses the Byggmax website only as a source of information and not at all as a purchasing channel; so-called window shopping where the customer only browses products and information without any intention to buy at that moment. To the respondent the scenario of "Task 1" was presented as follows:

"You are about to renew your flooring in your apartment, and you have come to the Byggmax.fi website because you want to:

1) Browse different flooring materials and options
2) Decide on one that you like
3) Locate the address to your nearest physical Byggmax store because you want to see the flooring up-close in natural light and finalize your purchase in-store instead of online

The task ends by pressing the ESC-button after you have located the address to your nearest Byggmax store or by pressing the ESC-button at any other time for any reason that normally also would get you to leave the site."

TASK 2

The second task was as well a need-based task but this time the customer uses the website as a purchasing channel with the intention to find the products needed and purchase them online from the Byggmax web shop. To the respondent the scenario of "Task 2" was presented as follows:

"You are about to expand your existing backyard terrace, and you have come to the Byggmax.fi website because you want to:

1) Buy 40 meters of the product "*Decking board 28X95 BROWN*"
2) Buy one box of 55mm long stainless decking screws for fastening the boards
3) Order the products through the web shop on home delivery

To clarify; you need to find the products mentioned above, put them into the shopping basket in the right amount, continue to the checkout, fill in the checkout information and select a payment method. The task ends by pressing the ESC-button after you have chosen a suitable payment method or at any other time for any reason that normally also would get you to leave the site."

3.4 Data analysis

Analysis of the data for this research started shortly after the data collection itself was completed and lasted for a time period of about three weeks. The data from the pre-session survey was not analyzed in any specific way since it contained only raw background information, such as demographics of the respondents, and statistics of the results were automatically provided by the free survey tool software from SurveyMonkey. The large amount of data collected with the Tobii T120 eye-tracker device from the two recorded tasks was analyzed with the help of the tools provided in the Tobii Studio 3.4.8 software; heatmaps, gaze plots, clusters, gaze replays, AOI's and different statistical outputs were used. All recorded post-session respondent interviews were listened to on play back and the most essential takeaways were transcribed per respondent and compared in order to find themes or statements that recur or stand out in some way for the benefit of answering the research questions of this thesis.

3.5 Validity and reliability

A researcher cannot in any way know for certain or assure in any way that all findings in the conducted study are credible to their full extent; the only thing one can do is to decrease the chance of getting the answers wrong as much as possible by paying close attention to two important research elements i.e. validity and reliability. These elements are explained by Saunders et al. (2009, p.156-157) as follows; "***Reliability*** *refers to the extent to which your data collection techniques or analysis procedures will yield consistent findings*" & "***Validity*** *is concerned with whether the findings are really about*

what they appear to be about". When it comes to eye-tracking it is all about accuracy and precision which are the main measurements or indicators for validity in an eye-tracking study; higher accuracy and precision means higher validity of the results. Accuracy in eye-tracking is the average difference of the real gaze position in comparison to the measured gaze position when again precision refers to the eye-tracker devices' ability to replicate similar measurements in consecutive samples. The level needed regarding accuracy in an eye-tracker study is dependent on the type of the study and the accuracy can vary in errors because of factors like e.g. calibration quality, lighting and respondent's own actions and behavior (Tobii 2019).

To enhance the reliability and validity of the research in this thesis the respondent tasks carried out on the website were designed to be need based in order to simulate as authentic situations for the respondents as possible; the website of Byggmax is one that customers usually come to for some particular reason or need and not to browse around and kill time like e.g. on a website for daily news. The setting, instructions, stimuli and procedures for the data collection was as well the same for all respondents participating in the research. The data collection environment was also as neutral and made as like everyday conditions as possible; the laboratory where the data collection took place reminds more of a modern, inspiring and creative working environment than a rigid and formal classroom. The Tobii T120 eye-tracker also looks quite neutral and appeared as a common computer monitor to the respondents; a brief introduction of the device was also given to the respondents to make them more comfortable and avoid any possible distraction regarding the device during the recordings. It must however be kept in mind that this was a simulated experience carried out in an unfamiliar environment to the respondents who also were conscious of that they and their actions were being observed and recorded; these factors may have diverted the respondents' behavior to some extent compared to how they would have behaved in a natural environment without the presence of these factors.

Considering the reliability and validity of the data analysis it can be stated that all the collected data was analyzed and processed using the same methods and tools without any exceptions. The Tobii Studio 3.4.8 software informed average recording accuracies of 91,27 % for "Task 1" and 81,57 % for "Task 2" after all recordings were completed;

the reason for the slightly lower accuracy on "Task 2" is that apart from "Task 1" the respondents were forced to use the keyboard and look away from the screen much more during the recording in "Task 2". The average accuracies counted for 15/15 respondents in "Task 1" and 14/15 respondents in "Task 2" since one recording unfortunately failed and could not be considered useful. In the interview's attention was paid to reliability and validity by recording them and keeping the interviews completely open and letting the respondents share their views and thoughts about the website and their experience freely without being asked too detailed questions; the use of the researched website on a laptop as stimuli during the interview significantly helped the respondents recall and elaborate on their actions. It is also notable that all data for this research was collected from respondents that were purposively picked and matched the commissioning parties' criteria regarding sampling.

4 RESULTS & FINDINGS

As stated earlier in section 1.4 this thesis aims to answer four research questions by analyzing the data collected by the eye-tracking sessions and the corresponding post-session interviews. "Task 1" gathered data for answering research questions 1-3, "Task 2" gathered additional data for answering research questions 1 & 3 and the post-session interviews gathered data for answering mainly research question 4 but also gave additional insights to the findings for research questions 2 & 3. The findings and results from the eye-tracking and interview data analysis are presented and elaborated on below per research question both in writing, displays of visual content and tables in sections 4.2 – 4.5.

4.1 Task completion

The average recording time of all 15 respondents for "Task 1" was 3 minutes and 57 seconds; the shortest recording ended after 1 minute and 35 seconds when the longest lasted for 8 minutes and 33 seconds. Regarding "Task 2" the average recording time was 6 minutes and 14 seconds in the same span of 15 respondents where the shortest recording ended at 3 minutes and 23 seconds and the longest after 9 minutes and 59 seconds. From the recording times we can see that the completion of "Task 2" clearly

required more time than in “Task 1”; the main reasons for this is that firstly “Task 2” contained more steps than “Task 1” to do for the respondent on the way to completion and secondly “Task 2” also required to locate two specific products instead of browsing a specific product group and choosing a product of interest like in “Task 1”.

Task completion was granted in “Task 1” if the respondent was able to locate the address to the nearest Byggmax store and in “Task 2” if the respondent was able to complete the checkout process until choice of payment method with at least one of the two assigned products in the basket. The average completion rate for “Task 1” was 87 % since 13/15 respondents found the address to their nearest Byggmax store and in “Task 2” the completion rate was 80 % as 12/15 respondents made their way until choice of payment method. In “Task 1” the two respondents (R_06 & R_10) who did not locate the store address said post-session that they did not even look for it since they knew from before the location of their nearest Byggmax store when again in “Task 2” the three respondents (R_02, R_05 & R_15) who did not complete it chose to abandon the task before choosing a payment method.

4.2 Visual attention

- **RQ1**: What attracts the customer’s visual attention on Byggmax.fi?

Considering RQ1 and the findings around visual attention, it must be kept in mind that both eye-tracking tasks in this research were so-called need-based which means that the respondent already had a known need for something before entering the site; this of course affects to some extent what the respondent starts looking at and searching for at the point of entering the site. The results could therefore be different in a case where the respondent would enter the site only to browse through it without any specific need. However, this thesis mainly aims to analyze the usability and the UX of Byggmax.fi; specific issues and insights regarding these factors are more easily gathered through simulated customer tasks than by general browsing. The findings and results considering visual attention will be answered from the three main content standpoints; the home page, the category pages & the product pages.

Home page

At the time of data collection, the Byggmax.fi home page appeared on the eye-tracker screen to the respondents as shown in Figure 13 below. On the yellow area, top left is the new Byggmax logo, in the middle is the search field and top right is the store selector. On the red area, the main product categories are shown from left to right and they each convert into a dynamic drop-down menu by moving the cursor on top of them; to the right of the red area in green is the shopping basket. The large area beneath the red category field is the main home page banner which changes regularly depending on Byggmax' seasonal and commercial activities; at the time of data collection the banner communicated that Byggmax has lowered the prices of all floorings and broadened the selection; the banner also prompted in the red balloon visitors towards checking out the lowered prices. By clicking anywhere on the banner, the category page for flooring would show up on the screen. The four smaller boxes below the main banner are easy shortcuts to popular product categories; bathroom, parquet, heat pumps and stairwells.

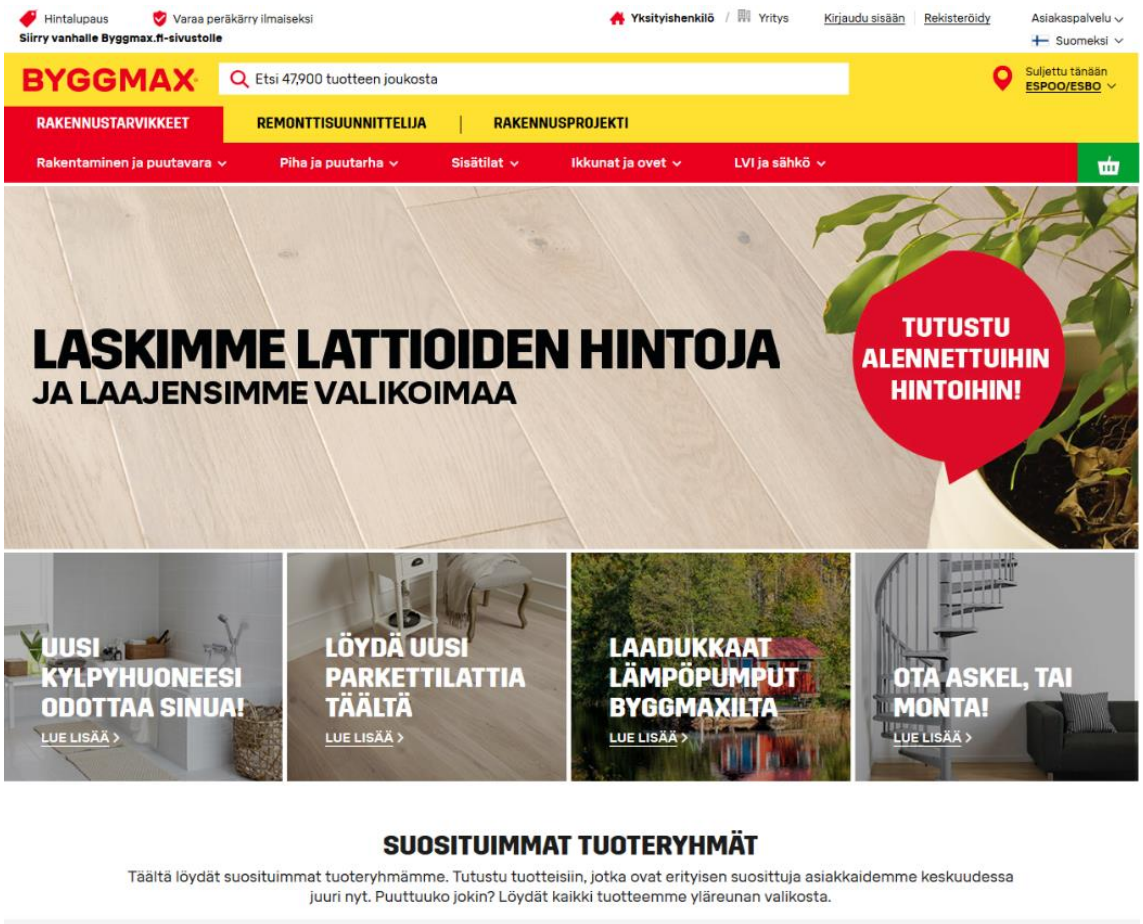

Figure 13: Above the fold view of Byggmax.fi home page

As stated in section 1.4 there were some assumptions amongst key person in the management of Byggmax regarding what the respondents' visual attention would be drawn towards after entering the site; the new Byggmax logo and the large home page banner. To figure out if there is truth behind these assumptions AOI's were drawn around these elements (see Figure 14) and analyzed for statistics on "Time to first fixation" and "Fixation duration" (see Table 6) with the eye-tracking data from "Task 1" when the respondents first entered the site. This can be seen to be most reliable to do for "Task 1" since it is the first point of contact with the site for the respondents and alongside that their need in "Task 1" correlates directly with what the main banner communicates to them; i.e. flooring.

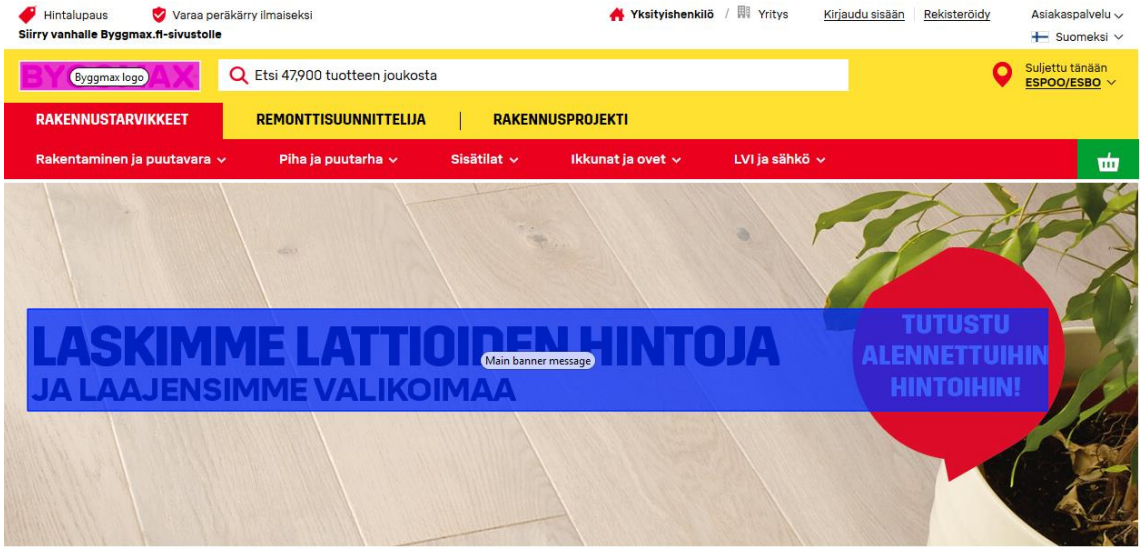

Figure 14: AOI's for Byggmax logo and main banner message

As we can see in Table 6 below only 2/15 respondents registered at least one visual fixation on the Byggmax logo in "Task 1" before moving forward from the home page. Analyzing the fixations, it can be said that the fixation on the logo by R_07 (Rec 08 in Table 6) occurred 0.99 seconds after entering the site but was so brief (duration of 0.15 seconds) that most likely the respondent did not actually look at it even if a fixation was recorded. R_15 can be said to have been the only respondent that consciously looked at the logo since two fixations were recorded 1.32 seconds after entering the site having a combined duration of 0.47 seconds; watching the gaze replay of R_15's session it appeared that the respondent's first fixation was in the first half of the logo and the second

in the latter half of it which confirms that the respondent read the logo from left to right consciously.

	Time to First Fixation						Fixation Duration		
	https://www.byggmax.fi/						https://www.byggmax.fi/		
	Byggmax logo			Main banner message			Byggmax logo		
Recordings	N (Count)	Mean (.Secor	Sum (.Secor	N (Count)	Mean (.Secor	Sum (.Seconds	N (Count)	Mean (.Secor	Sum (.Secor
Rec 01	-	-	-	1	1,98	1,98	-	-	-
Rec 02	-	-	-	1	2,16	2,16	-	-	-
Rec 03	-	-	-	1	0,07	0,07	-	-	-
Rec 04	-	-	-	-	-	-	-	-	-
Rec 06	-	-	-	1	6,28	6,28	-	-	-
Rec 07	-	-	-	-	-	-	-	-	-
Rec 08	1	0,99	0,99	1	5,20	5,20	1	0,15	0,15
Rec 09	-	-	-	1	0,81	0,81	-	-	-
Rec 10	-	-	-	-	-	-	-	-	-
Rec 11	-	-	-	1	0,82	0,82	-	-	-
Rec 12	-	-	-	1	0,72	0,72	-	-	-
Rec 13	-	-	-	1	0,27	0,27	-	-	-
Rec 14	-	-	-	1	0,89	0,89	-	-	-
Rec 15	-	-	-	1	11,97	11,97	-	-	-
Rec 16	1	1,32	1,32	1	0,16	0,16	2	0,23	0,47
All Recordings	2	1,16	2,31	12	2,61	31,33	3	0,21	0,62

Table 6: Fixation statistics on Byggmax logo and the main banner

Regarding the main home page banner, it was verified through analysis of gaze replays that 7/15 respondents did not see the main banners message at all even if Table 6 above shows that only 3/15 did not see it. The reason for this is that the category drop-down menu covers the banner completely when activated from the red category bar and the eye-trackers analysis software does not distinguish between layers when counting fixations on an AOI. Practically this means that a respondent's fixation in the drop-down menu in the same area as the main banner message beneath is calculated in the statistics of Table 6; therefore, it was necessary to watch the gaze replays of all respondents to confirm who saw the main banner message and who did not. Table 7 beneath explains the outcome of the gaze replay analysis. A we can see 8/15 respondents saw the banner message and 7/15 did not; two out of these seven who did not see it did not even have the chance to do so since it occurred in the gaze replays that they accidentally held the cursor exactly on top of a category in the red bar which automatically opened the drop-down and covered the banner when they entered the site. The most common path to the flooring category was to go through the category drop-down menu as it was the choice

of 12/15 respondents in “Task 1”. An interesting observation though is that R_10 was the only one who actually clicked on the banner and used it as the path to start browsing flooring options; considering how large of an element the banner is on the site together with the fact that it communicated the solution to the need of the respondents the fact that only one respondent clicked on it is quite remarkable. R_03 used the parquet prompt as the path to browse flooring options and R_14 relied on the search field. Fixation duration was not considered here since it would not have been reliable because the eye-tracker software did not distinguish on fixations between layers as already stated before.

Recording	Respondent	Saw banner message	Navigated to flooring category through:	Comment
Rec 01	R_01	YES	Category drop-down	
Rec 02	R_02	YES	Category drop-down	
Rec 03	R_03	YES	Parquet prompt	Located beneath the main banner
Rec 04	R_04	NO	Category drop-down	
Rec 06	R_05	NO	Category drop-down	
Rec 07	R_06	NO	Category drop-down	
Rec 08	R_07	NO	Category drop-down	
Rec 09	R_08	YES	Category drop-down	
Rec 10	R_09	NO	Category drop-down	
Rec 11	R_10	YES	Main banner click	Clicked to flooring through banner 14s after entering
Rec 12	R_11	NO	Category drop-down	Had cursor on the red category field when entering
Rec 13	R_12	YES	Category drop-down	
Rec 14	R_13	YES	Category drop-down	
Rec 15	R_14	NO	Search field	Had cursor on the red category field when entering
Rec 16	R_15	YES	Category drop-down	

Table 7: Results of the gaze replay analysis in "Task 1"

Generally, the visual attention of the respondents was very much fixated on the categories situated on the red bar above the main banner as well as on the more detailed subcategories in the drop-down menu associated with the need in “Task 1” as we can see below in Figure 15. The search field has got much more attention in “Task 2” as we can see from the heatmap in Figure 16 and the explanation to that is that 12/15 respondents chose to start the search for the two assigned products in “Task 2” via the search field instead of going through the categories as they mostly did in “Task 1” where the need was not any specific product but instead more general. By converting the heatmap of the home page into a version where only the areas the respondents saw are visible gives a good overview of what was highlighted and what was left completely out of sight; Figure 17 below illustrates this regarding “Task 1” and Figure 18 regarding “Task 2”. All screenshots of the home page are cut at the fold line since only one respondent scrolled.

Figure 15: Heatmap of the home page in "Task 1"

Figure 16: Heatmap of the home page in "Task 2"

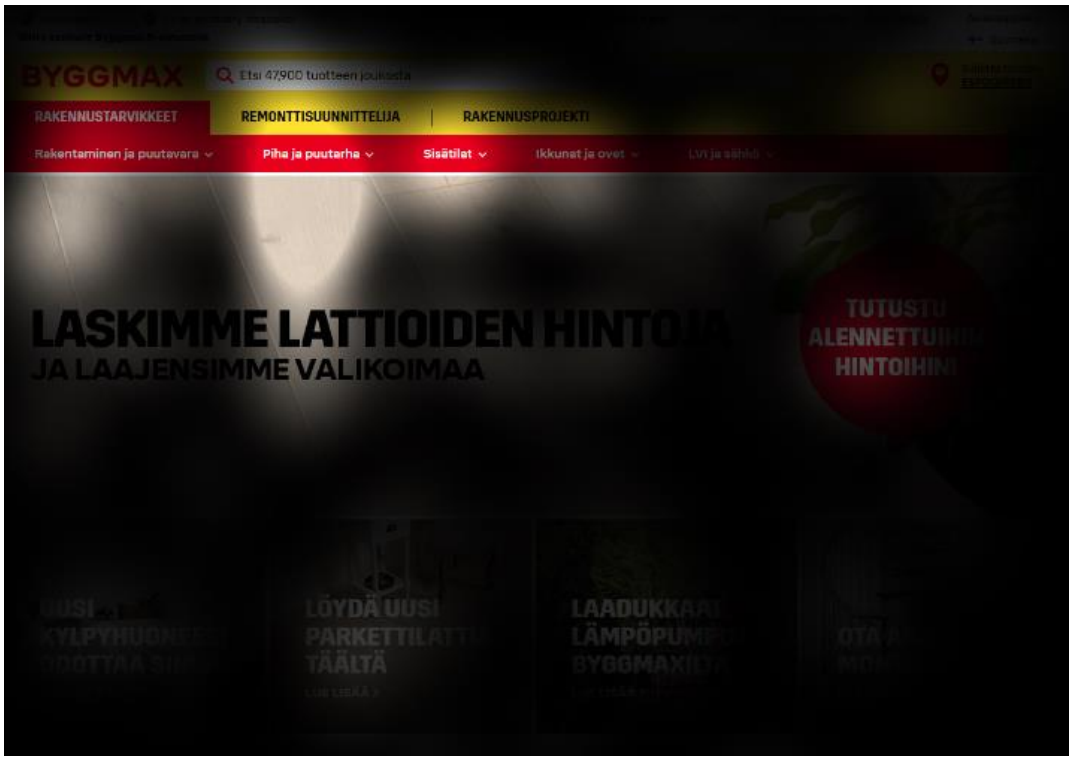

Figure 17: Gaze opacity illustration of the home page regarding "Task 1"

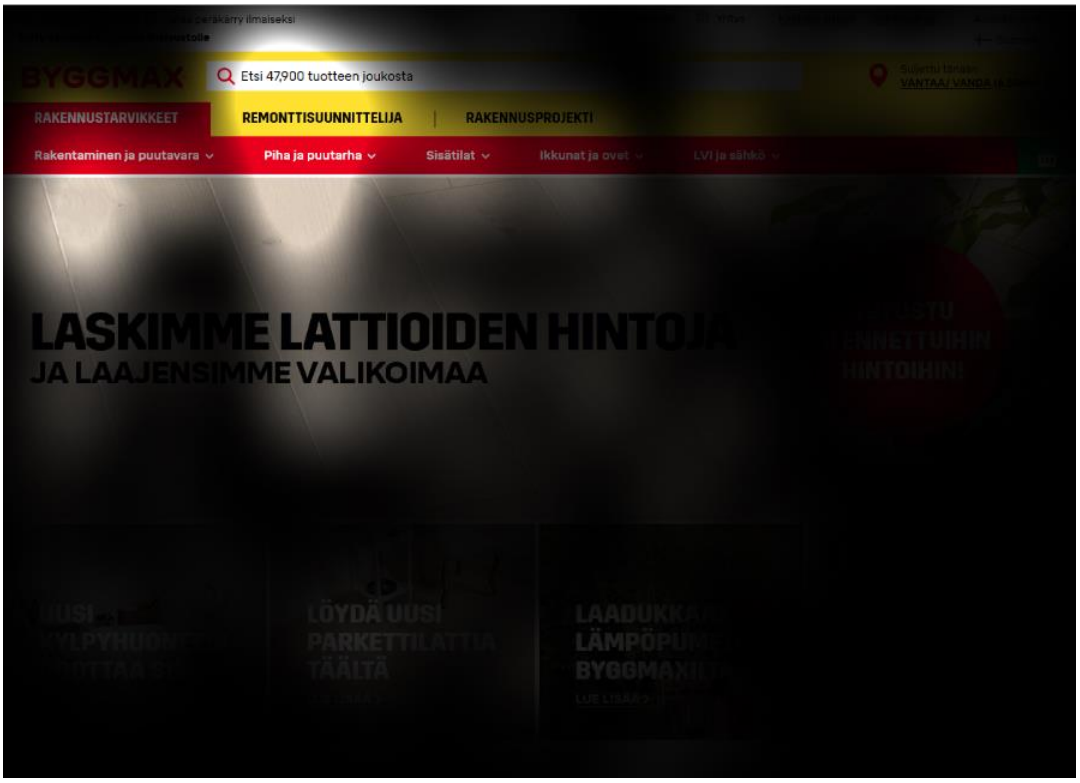

Figure 18: Gaze opacity illustration of the home page regarding "Task 2"

Category pages

The respondents' visual attention on the category pages in "Task 1" when browsing flooring options was mainly focused on the filtering options to the left on the site as well as on the first products in the product listing (see Figure 19); it seems like the first listed product gets the most attention but also the other three products on the first horizontal row of products are clearly noticed. The visual attention is quite low on the following product rows in the listing as we can see from the heatmap in Figure 19 where there is only some minor gaze colored in green on the products listed below the first horizontal product row. The same pattern as shown in Figure 19 also appeared on the category page for parquet and wooden floorings that 7/15 respondents visited when browsing flooring options in "Task 1". An interesting insight can partially be seen from the heatmap in Figure 20 which illustrates the visual attention on the main category page for flooring; i.e. a general category page for flooring products and not a specific category page like e.g. parquet. On this main category page, the first two products are flooring accessories and not actual flooring options that the respondents were browsing for. As we can see there has been a lot less gaze on these than e.g. on the first products on the specific category page for laminate floorings in Figure 19 and instead a lot more on products in the listing that appear to be what the respondents searched for. The heatmap in Figure 20 only illustrates this finding partially since the heatmap is visualized on top of a screenshot on the original view of this particular page and does not take into consideration that the view changes when the respondent clicks on the filtering options to the left; this insight has however been confirmed by watching gaze replays of the respondents that visited the main category page for flooring in "Task 1".

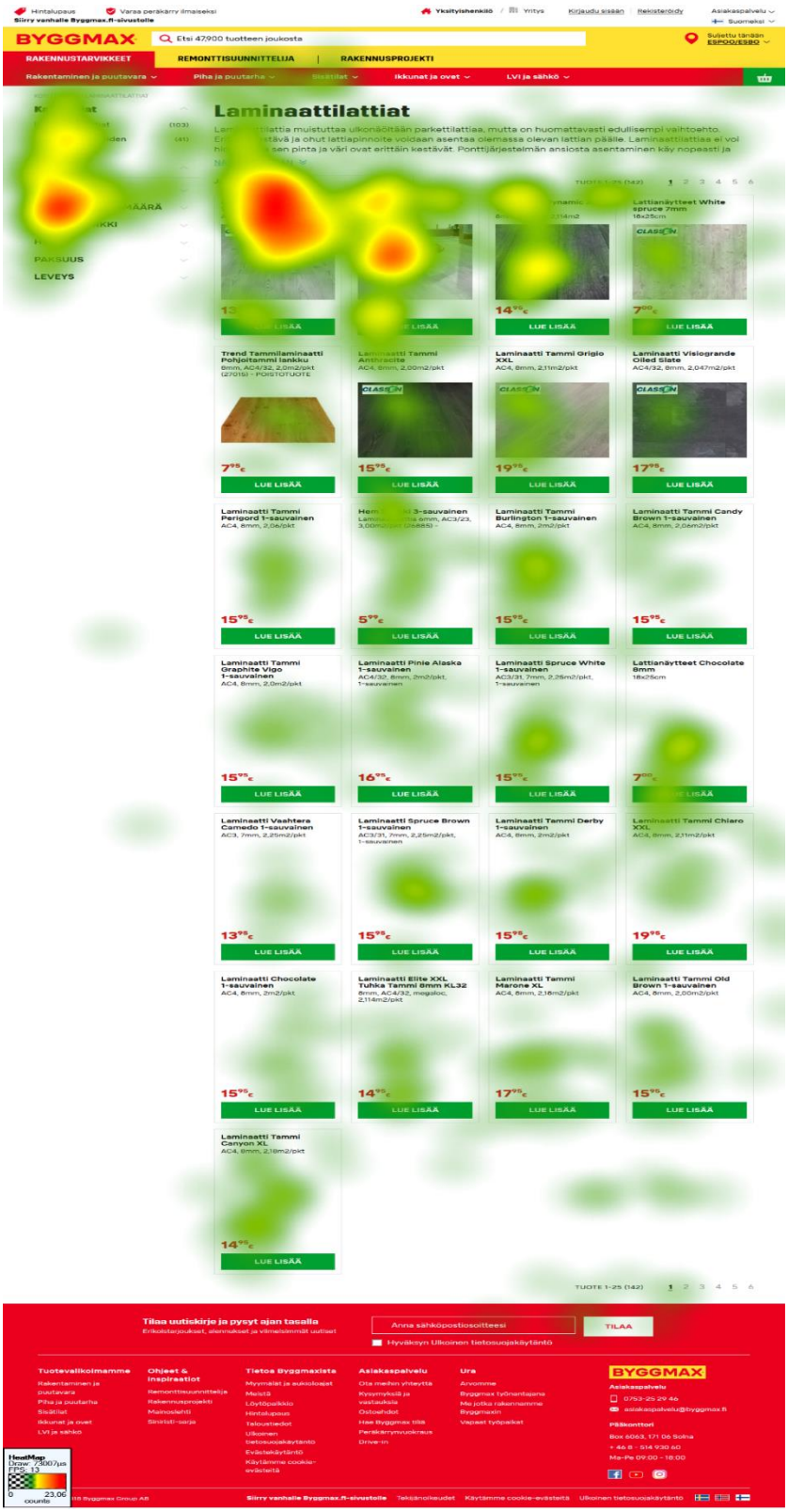

Figure 19: Heatmap of 10/15 respondents on category page "Laminate flooring" in "Task 1"

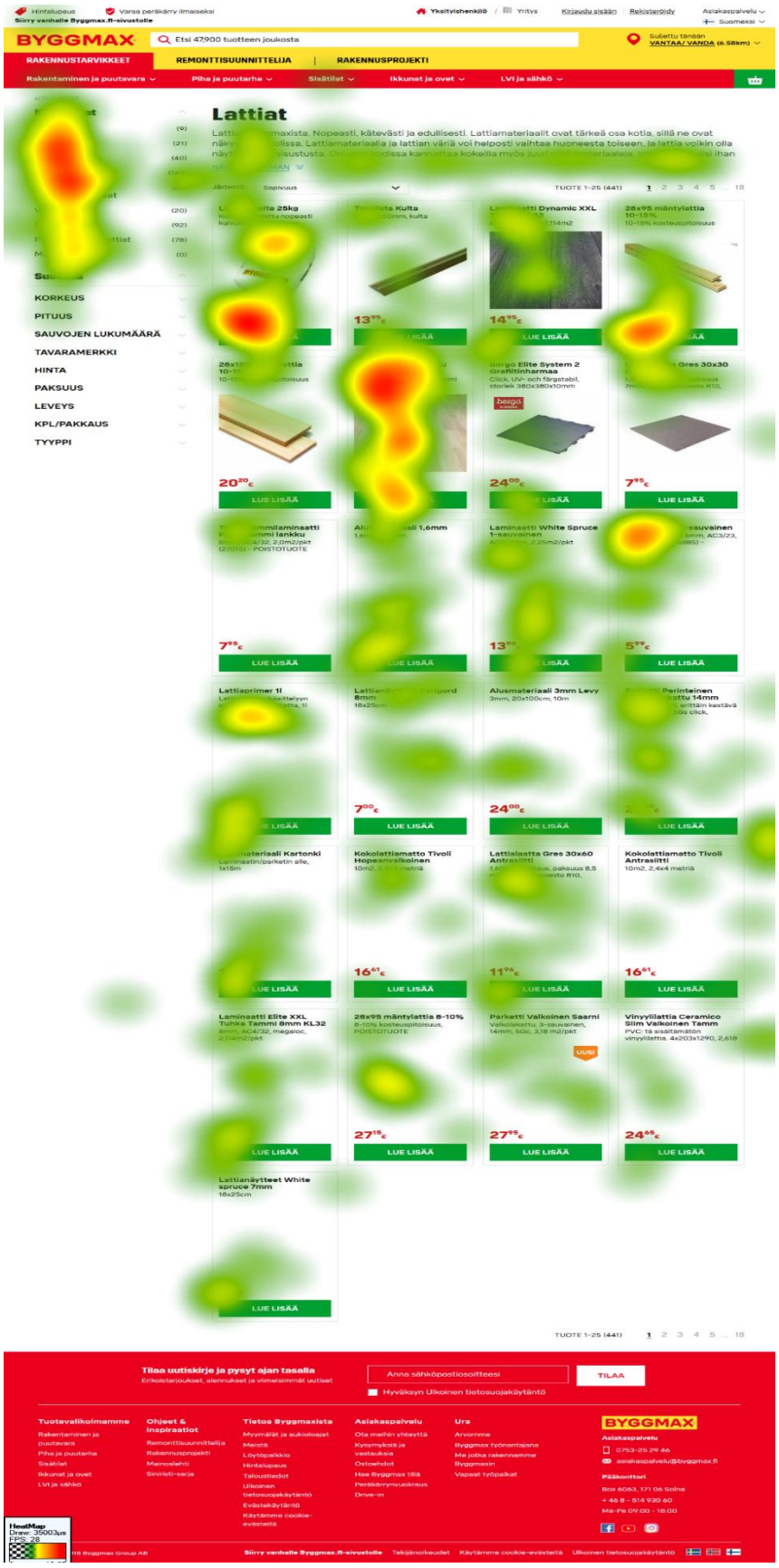

Figure 20: Heatmap of 5/15 respondents on category page "Flooring" in "Task 1"

As stated earlier, most respondents used the search field function in “Task 2” to find the products needed; this means that there were very few visits to specific category pages and many visits to pages showing search results. One category page that was visited by 8/15 respondents through the category drop-down was the category page “Decking screws”. As we can see in Figure 21 the respondents mainly looked at the product headings and subheadings when searching for the specific screw needed; some gaze can also be seen on the filtering options to the left. So apart from the visual attention in “Task 1” the gazes of the respondents were more evenly distributed on all visible products when the need was for a specific product and not general browsing. The same visual pattern occurred on the search result page for the remaining seven respondents that used the search field to find the decking screws as we see in Figure 22 below.

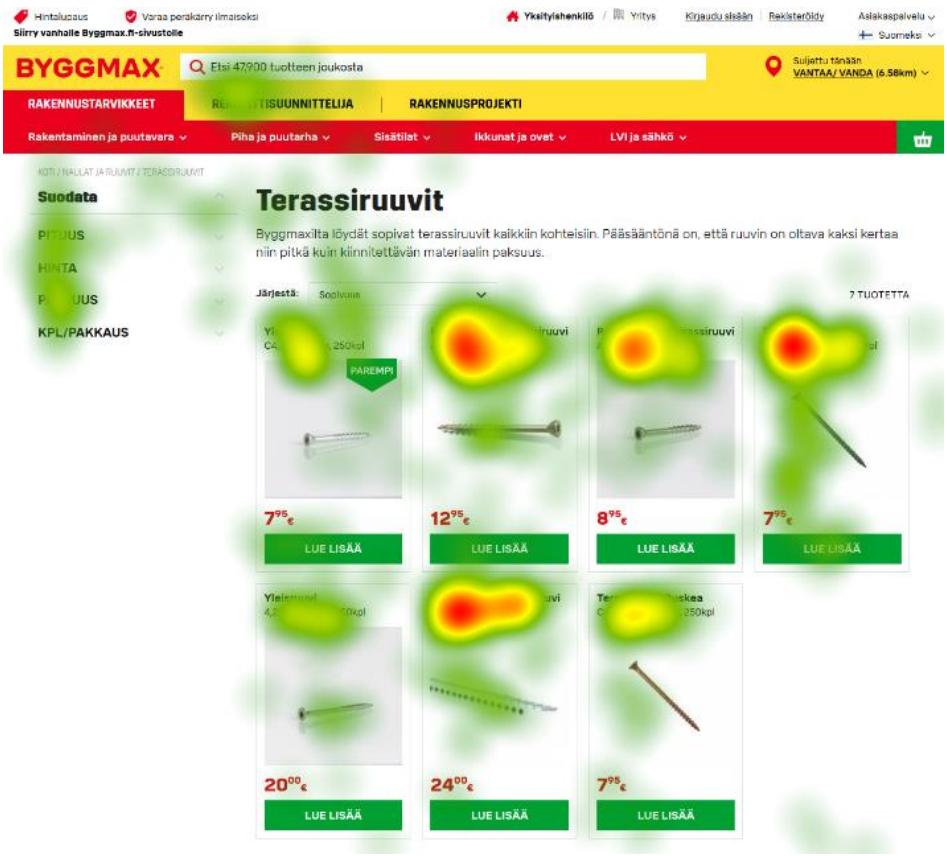

Figure 21:Heatmap of 8/15 respondents on category page "Decking screws" in “Task 2”

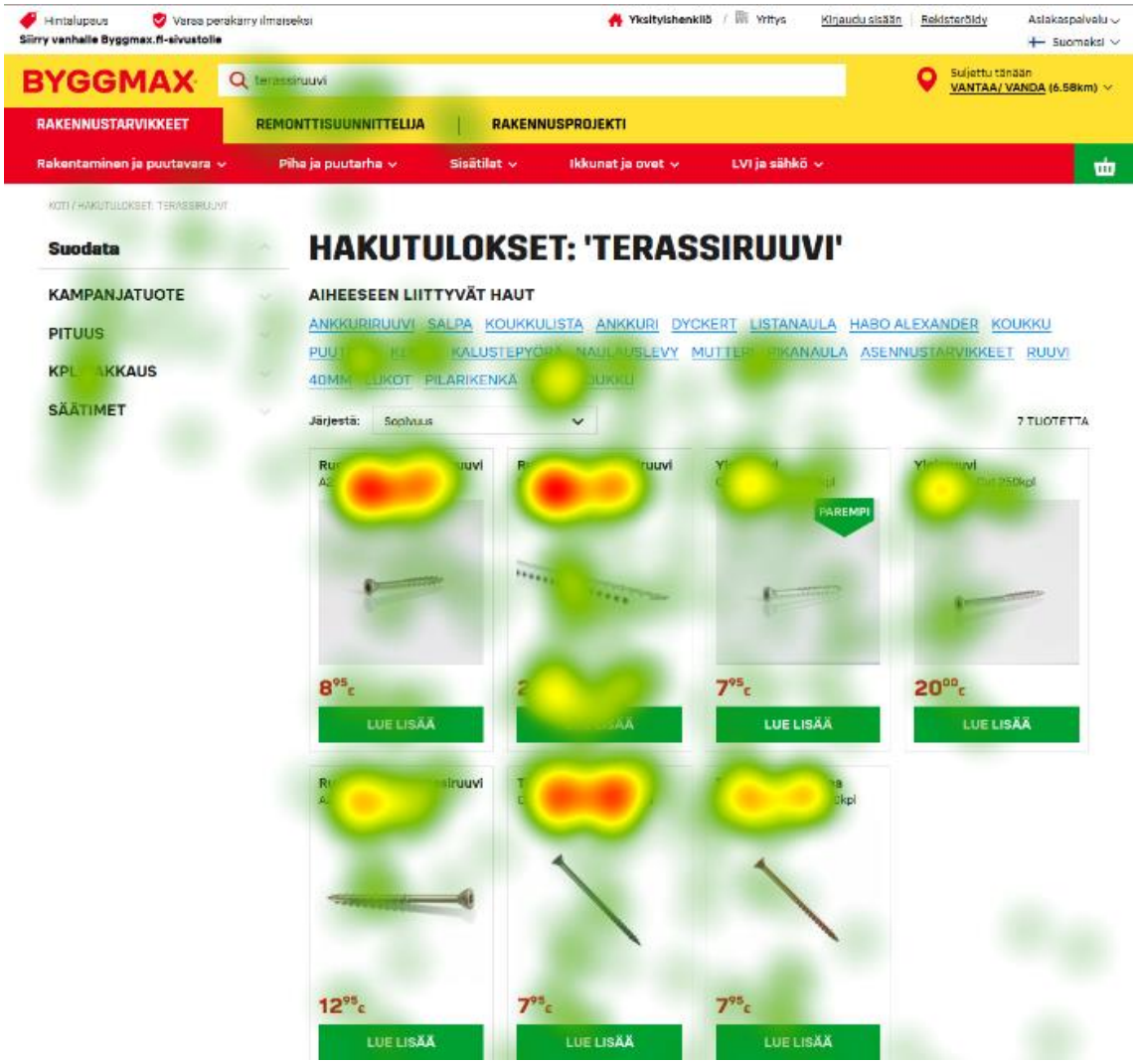

Figure 22: Heatmap of 7/15 respondents on the search results for decking screws in "Task 2"

In "Task 2" 11/15 respondents found the decking board through the search field and 4/15 found it through the category drop-down; the heatmaps in Figure 23 and 24 below show that the respondents did not have any problems finding the right product since only minor gaze has been allocated to the other products and lots to the product needed. In comparison, the heatmaps regarding decking screws presented earlier in Figure 21 and 22 clearly indicates that there have been problems finding the screw needed since all products and especially their headings did get very much visual attention by the respondents; more on the reasons for this can be found in the results of RQ3 in section 4.4 of this thesis.

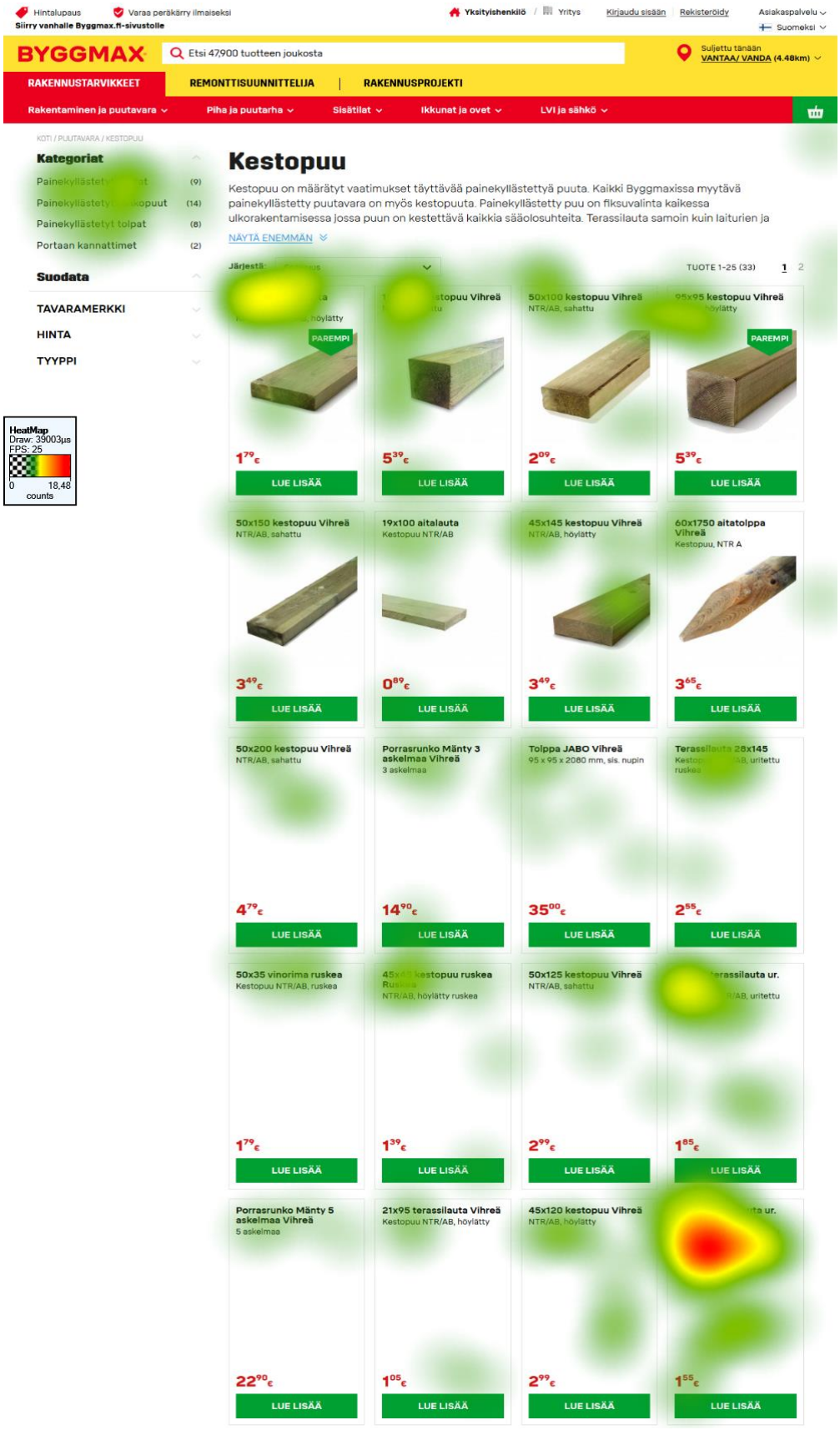

Figure 23: Heatmap of 4/15 respondents on the category page "Impregnated wood"

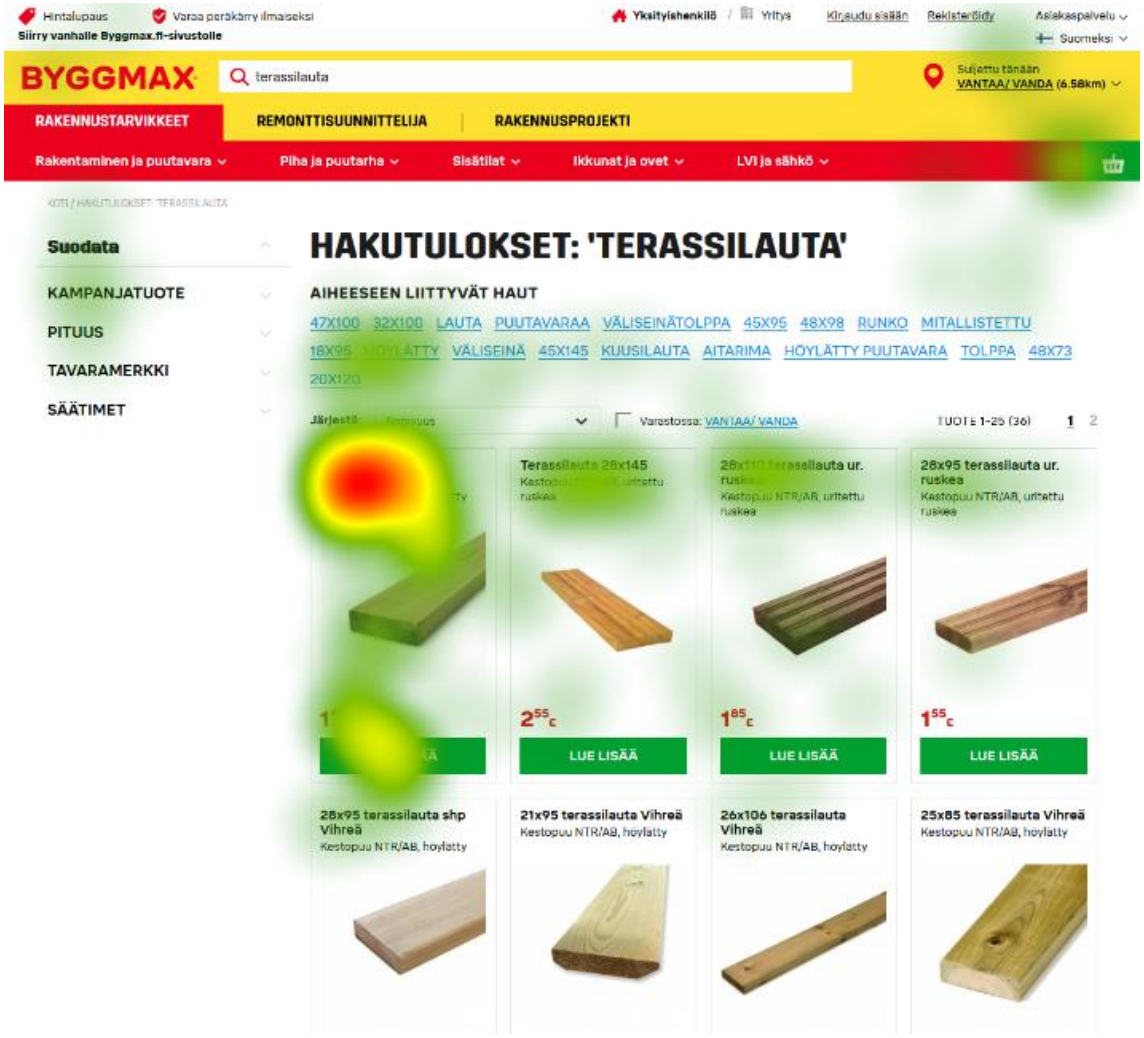

Figure 24: Heatmap of 7/15 respondents on the search result of "Decking board"

Product pages

There was also a clear difference in how the respondents viewed the product pages in "Task 1" and "Task 2" since the nature of the tasks also were quite different. In "Task 1" where the need was more general in form of browsing flooring options and picking one of interest without intention to buy more gaze was conducted on product pictures and product information. In "Task 2" where the needs were specific and the intention was to buy the product pictures and product information were almost ignored and the visual attention was more directed towards the product name, product price, product availability and the buttons of adding amount and putting product into shopping basket. Since "Task 1" did not have specific products it was not possible to get any compilation of gazes on one product page since all respondents visited different product pages of

floorings as of own interest and liking. The findings regarding gaze on product pages in "Task 1" was therefore verified by watching gaze replays and analyzing gaze plots; an example of a gaze plot for a flooring product page is shown below in Figure 25 to illustrate the findings explained above regarding "Task 1".

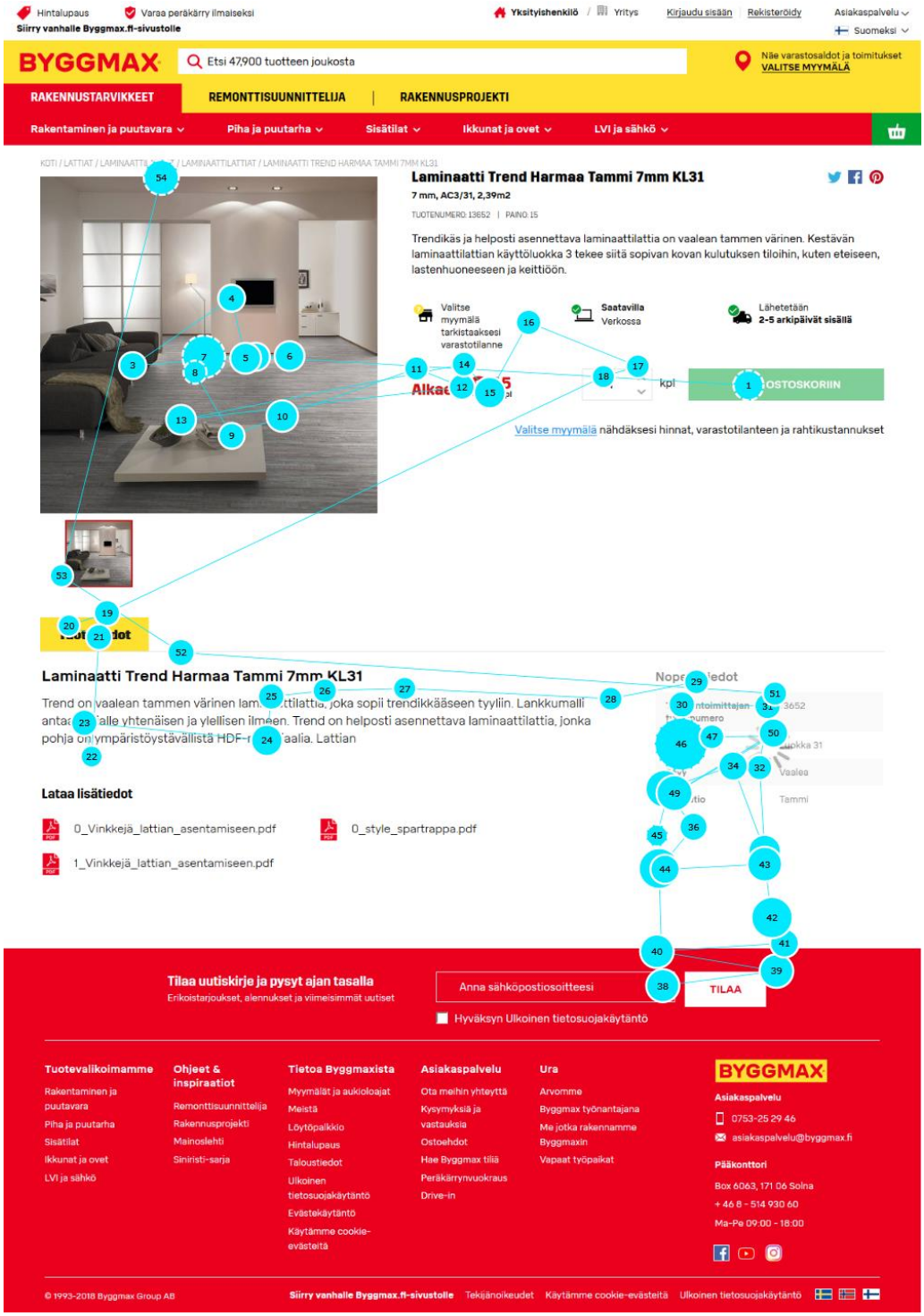

Figure 25: Gaze plot of R_07's first 55 fixations on product page

The pattern that occurred several times in the gaze replays of "Task 1" was that on the product pages of flooring the respondents tended to start off by looking at the product picture and move from the picture either by passing through the price information or by moving directly to the detailed product information below the picture. In the cases where the respondents wanted to continue to browse floorings after reading the product information the respondents either returned directly to the category page or re-visited the product picture once more before returning.

"Task 2" had specific products which made it possible to get heatmaps containing several respondents' gaze from the same product page and in Figure 26 and 27 we can see that the attention of the respondents was as stated before more directed towards A=Product name and brief info, B=Product price, C=Product availability, D=Amount button and E=Put into basket button. The box named F in Figure 26 illustrates gaze that occurred on the drop-down menu after the product had been put into the basket and the respondent moved on to search for the decking screw; the box named G contains gaze on the small shopping basket window that occurs automatically when a product has been put into the basket. The gaze in areas F and G are therefore not visual attention on the area visible in Figure 26 but instead gaze that occurred on separate elements layered on top of the product page as a result of actions taken by the respondent.

Figure 26: Legend of elements on product page + heatmap of 4/15 respondents in "Task 2"

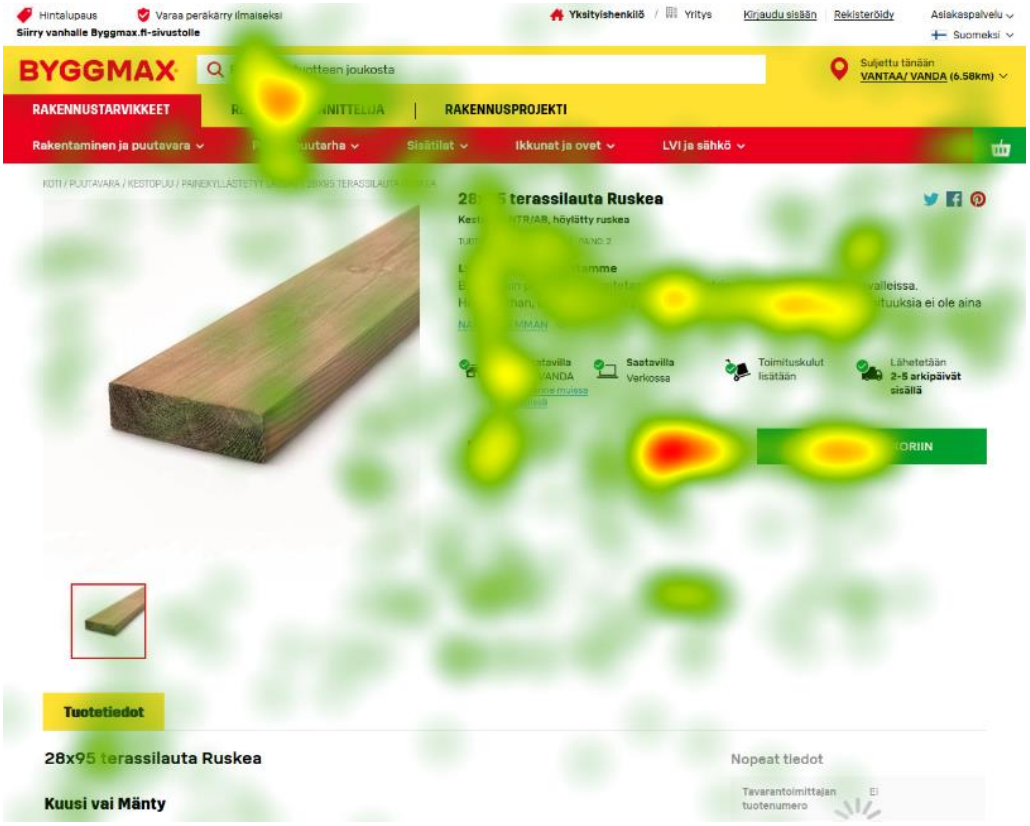

Figure 27: Heatmap of 9/15 respondents on product page in "Task 2"

The same goes for Figure 27 as shown in Figure 26 regarding the areas F and G; the gaze shown in these areas has been recorded from viewing layered dynamic elements and not from the static view shown on the heatmap. It is apparent that the product picture has not interested the respondents at all when finding the decking board and putting it into the basket even if the picture element is very sizeable compared to other elements on the product page.

Considering what of the elements on the product page first captured the respondents' attention, Table 8 below shows the statistics of time to first fixation on AOI's drawn up on the product page as shown in Figure 28. The statistics in Table 8 also confirms that the product picture has not been of any interest to the respondents in "Task 2" since only two respondents has had a fixation inside the product picture AOI within the first five seconds after entering and only R_06 (Rec 07) has looked at the product picture first regarding all AOI's in Figure 28. The AOI's named product info and product availability are clearly the two AOI's that has gotten the earliest fixations from the respondents considering the statistics in Figure 28. It must be kept in mind that these statistics are taken from the respondents with the specific need in "Task 2" of this research and the

findings could differ significantly from these in other cases with different settings and different visitor needs etc.; this phenomenon was seen already in “Task 1” of this research where much more visual attention was paid by the respondents to the product picture since the need was to find a flooring that they liked.

	Time to First Fixation											
	https://www.byggmax.fi/28x95-terassilauta-ruskea-p08728097											
	Product availability			Product info			Product picture			Product price		
Recordings	N (Count)	Mean (.Secor	Sum (.Secor	N (Count)	Mean (.Secor	Sum (.Secor	N (Count)	Mean (.Secor	Sum (.Secor	N (Count)	Mean (.Secor	Sum (.Seconds
Rec 01	1	5,84	5,84	1	6,10	6,10	-	-	-	1	1,86	1,86
Rec 03	1	22,98	22,98	1	25,34	25,34	1	4,14	4,14	1	3,89	3,89
Rec 05	1	1,64	1,64	1	9,36	9,36	-	-	-	1	1,49	1,49
Rec 06	1	2,50	2,50	1	7,93	7,93	1	11,13	11,13	-	-	-
Rec 07	1	4,09	4,09	1	4,76	4,76	1	2,28	2,28	1	4,59	4,59
Rec 08	1	12,29	12,29	1	2,09	2,09	1	71,01	71,01	1	13,32	13,32
Rec 11	1	3,55	3,55	1	1,79	1,79	1	12,49	12,49	1	11,81	11,81
Rec 12	1	11,54	11,54	1	2,03	2,03	1	28,68	28,68	1	22,93	22,93
Rec 15	1	2,17	2,17	1	2,52	2,52	1	10,83	10,83	1	27,54	27,54
All Recordings	9	7,40	66,60	9	6,88	61,93	7	20,08	140,57	8	10,93	87,43

Table 8: Time to first fixation statistics of 9 respondents on product page in "Task 2"

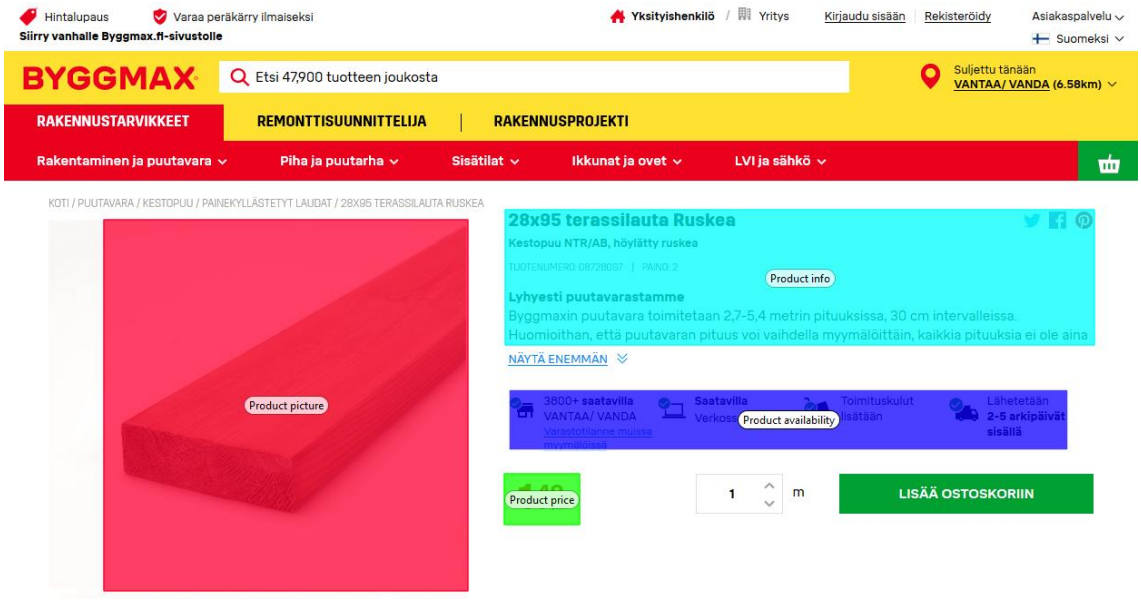

Figure 28: AOI's on product page in "Task 2"

4.3 User experience

- **RQ2**: Is the shopping process and the user experience (usability) on Byggmax.fi user friendly?

- **RQ3**: How was the visual attention and the user experience perceived post-session by the respondents and what would they change on the site?

As stated earlier in section 4.1 about task completion 2/15 respondents did not even try to find the directions to the nearest Byggmax store since they knew it from before; however, the 13 remaining respondents found the directions without any problems. The directions can be found through two different paths on the website and both were used by the respondents in this research; Figure 29 below shows the two paths available for finding the directions to the nearest Byggmax store, i.e. the store selector on the top-right and the footer heading "Stores and opening hours" at the bottom of the site. 4/13 respondents used the footer path and 9/13 clicked their way to the store directions through the store selector at the top-right of the site.

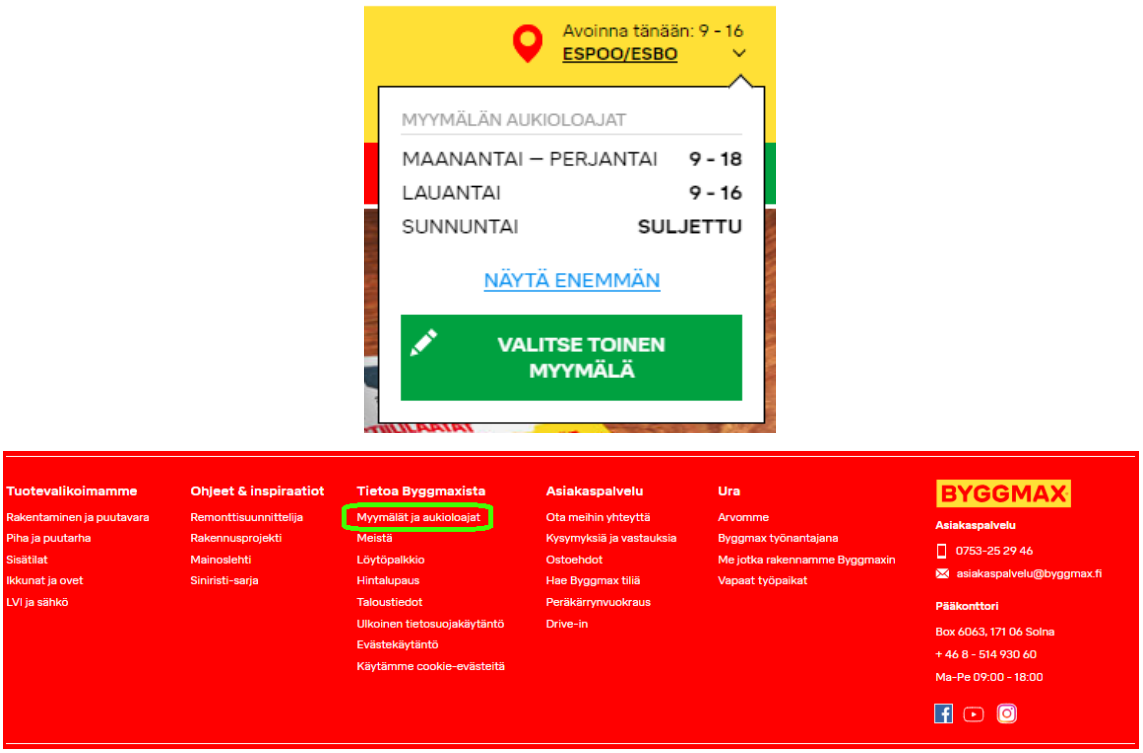

Figure 29: Paths to store directions on Byggmax.fi

To get to the actual page where the detailed directions and store information are shown both paths require extra clicks from the user. The store selector on the top-right requires the user to click on the blue text that says “SHOW MORE” when again the footer path opens up a page where the user again is required to click on a separate button that says “STORES AND OPENING HOURS” to get to the page showing the location of the stores in form of a dynamic map insertion. As we can see in Figure 30 the page very well communicates the address information to the respondents who all were easily able to find what they were looking for on this page.

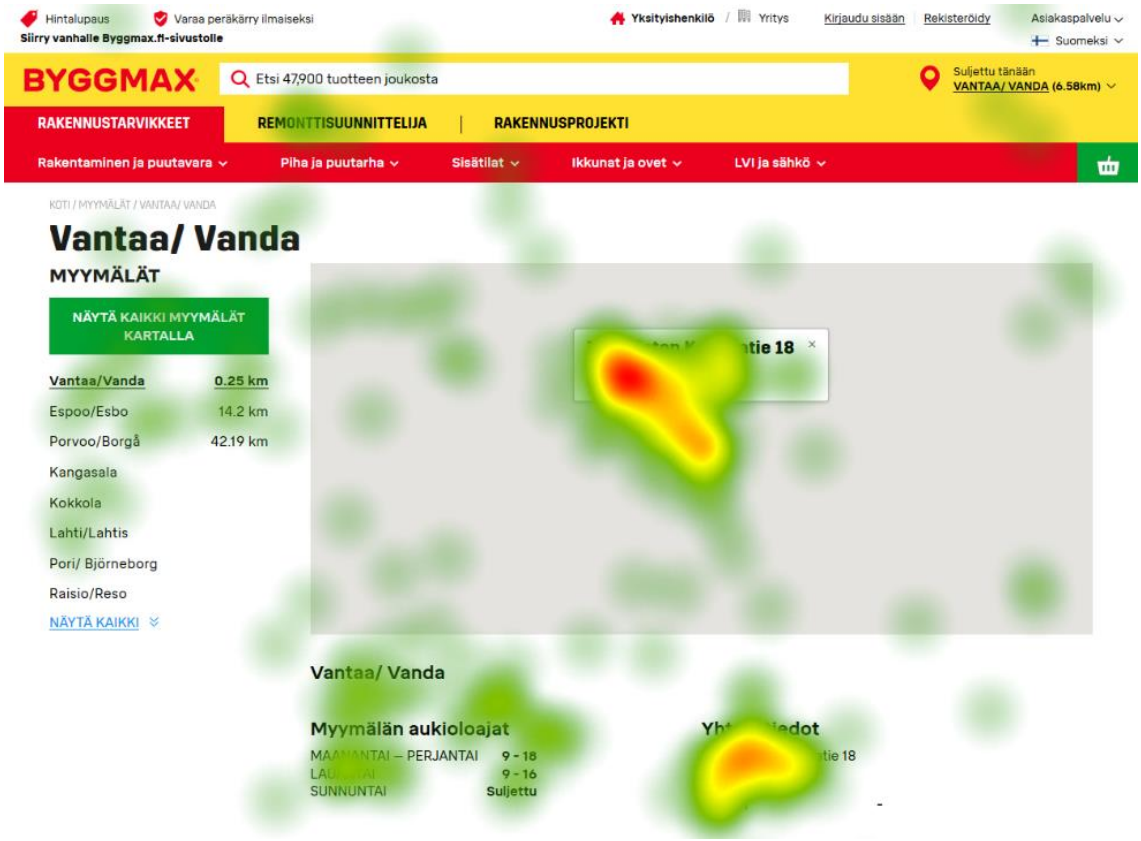

Figure 30: Heatmap of 8 respondents on the store information page for Byggmax Vantaa

The respondents did not find it difficult or complicated to locate the directions to the nearest Byggmax store, but many respondents however noted that the street address it-self could be visible earlier when selecting your store or findable with less clicks than it is today. The respondents suggested that the address of the store could be visible already at the top-right where the selected store is mentioned or at least in the small drop-down that is shown in Figure 29 so that the user would not have to click separately on the blue “SHOW MORE” text to find the store’s address by moving away to another page. The

extra page that showed up through clicking on the "Stores and opening hours" link in the footer requiring the user to click again on a button saying "STORES AND OPENING HOURS" was also experienced as unnecessary. Some comments from the post-session respondent interviews regarding this finding is shown below:

R_01: *"I expected that the address information would already have been visible in the drop-down and not until after the SHOW MORE click. The address could perhaps be visible already there where it now only says "Vantaa"."*

R_02: *"The address information of the store was shown very nicely there even if I had to click a few times to get there but I would say it still was easier than in most web shops…It could be good if the address also was stated already there from where you now get to move forward to the map, then it would be again one less click."*

R_04: *"I wondered a bit when I got to choose my nearest Byggmax store by entering my postal code since after that no information like address or map appeared. Then I noticed that it stated "Vantaa" at the top of the page and by clicking through there I then got to the address information. In my opinion the map or at least the street address to the store should appear immediately after choosing the store."*

R_05: *"The thing about finding the store was a bit confusing. I clicked on the "Find my nearest store" function at the top to the right and after entering my postal code the site did not show me any information as I assumed. It would be good to get the information visible without having to leave the page you are on."*

R_07: *"When I started to search for the address then the postal code or choice of store was asked, and I picked Vantaa as I know it is the nearest for me but then the site somehow did not give the address straight to me and I had to click further on SHOW MORE; so in principle if I choose the store I also hope it would show the stores information straight away…There where it now only says opening hours and that the store is closed right now could also be the address visible."*

R_08: *"I went through the footer then to find the address but then I wondered that why did it show a site again where I had to click again on the same thing and do it double?"*

To answer RQ2 and RQ3, both personal notices from observing the respondent sessions as well as observations from the recorded gaze replays were taken into account and analyzed together with respondent comments obtained in the post-session interviews to secure an understanding of the Byggmax.fi website's UX and usability. By combining all these observations, notices and insights, it became clear that the respondents liked the site, its looks and the UX of it on a general level apart from two respondents (R_12 & R_15) who clearly stated that the site did not appeal to them in such a way that they would return to the site or recommend it to others based on their experience from doing the tasks. Even if the site and the UX of it generally was experienced positively a good amount of issues and insights were pointed out by the respondents' actions during the tasks and post-session comments regarding the site's usability and UX; depending on how frequently the issues or insights occurred in the tasks and/or in the interviews they were categorized into two *major UX issues* and several *minor UX issues* as follows:

Major UX issues

Social security number in the checkout

This was the single largest issue at the site that clearly got the most attention from the respondents. During the tasked sessions and in the gaze replays it could clearly be seen that the respondents were confused at the last stage of the checkout process when they wanted to proceed to choose their payment method; all respondents except two (R_03 & R_13) also commented on this issue negatively in the post-session interview. The nature of this problem is that the checkout process directly asks for the user's social security number to be filled in when they enter the third phase, i.e. the payment phase, of the checkout; to be clear, this happens before method of payment has been chosen by the user. To describe the situation more specifically this issue will be explained beneath with a screenshot from the checkout (Figure 31), explanations of the crucial elements in the payment phase regarding this issue and a summary of the issue itself at hand.

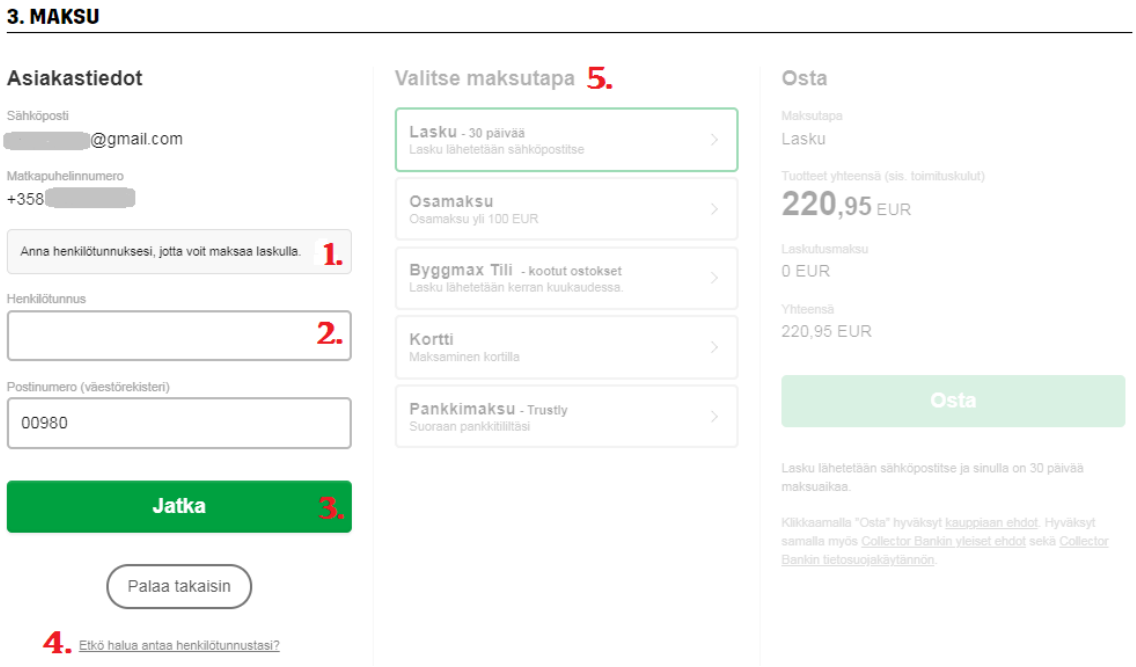

Figure 31: The payment phase of the checkout on Byggmax.fi

The view seen here in Figure 31 is the view as it appears live to the user when entering the payment phase of the checkout. As we can see the payment phase is divided into three vertical sections from left to right headlined; "Customer information", "*Choose your payment method*" and "*Buy*". All three sections are not active at the same time since the sections activate in sequence from left to right one at a time after the previous has been completed. The numbered elements in Figure 31 stands for:

1. An information field saying "*Give your social security number so you can pay by invoice*"
2. A field headlined "*Social security number*" for typing in your social security number
3. A Continue-button for continuing to the next step
4. A hyperlinked text element saying, "*Do you not want to give up your social security number?*"
5. The next step of the payment phase; i.e. "*Choose your payment method*". **NB!** This field is faded in coloring which means that it is inactive and cannot be clicked on or interacted with.

Summary of the issue; The issue here is that the social security number which is a sensitive piece of personal information is asked for immediately from the user when enter-

ing the payment phase; it is not explained in any other way why it is asked for than with the information field saying "*Give your social security number so you can pay by invoice*" shown as no.1 in Figure 31. This is controversial for the user since the user has not yet herself chosen any payment method at this stage and still the checkout asks for the social security number for the reason of being able to pay by invoice. At this point it is not possible for the user to change the payment method to e.g. card payment in the list (no.5 in Figure 31) since that section is inactive and can't be interacted with before pressing the Continue-button (no.3 in Figure 31); however, the checkout does not allow the user to continue without filling in a valid social security number in the field (no.2 in Figure 31). By pressing on the Continue-button without having a valid social security number filled in the checkout only generates a yellow prompt beneath the field (no.2 in Figure 31) saying "*Give your social security number*". The only way to get around the requirement of giving up your social security number is to press the small hyperlinked grey text element (no.4 in Figure 31) saying "*Do you not want to give up your social security number?*". By doing so the checkout provides the user with fields for filling in only your first name, last name and address information; at this stage the only payment method possible for the user though is card payment. This function is though very hard to find for the user since it is very small sized text, colored light grey on a white background and situated at the bottom of the checkout view. Some comments from the post-session respondent interviews regarding this finding is shown below, all comments on this issue are found in *Appendix 4*:

R_01: "*I knew from before from other web-shops that this kind of function ("Do you not want to give up your social security number?") does exist so I knew to look for it. The color of the text where you had to click is however too pale and definitely too hard to find especially for a person that does not even know too look for it*." … "*Then if you want to buy on invoice that should appear when it really is needed and not like this being there as first in the flow*."

R_02: "*The checkout is however a bit unpleasant, like if I want to pay by card then I'm still first asked for my social security number. In a real situation I would have thought that here must be some error and then I most likely would have left." … "If that "Do you not want to give…" function would have been clearly visible I would definitely have used it; now I did not even notice it.*"

R_04: "*In the checkout at least I would first ask what payment method you want to use because there are payment methods available where you do not need to give up your social security number. Now I had to first put in my social security number, but I would most certainly myself first ask the payment method and after that the information required for that specific payment method. This is according to my experience the way it works in most web-shops.*"

R_05: "*I order myself a lot from web-shops and this particular checkout does not match that what I am used to in web-shops and I do see a little problem here that I think will lead to some people jumping off; especially if you do not know Byggmax from before.*"

"*My supposition was that down here where it now says "Do you not want to give…" would be some terms of use or something or something so I did not pay any attention to it. That link should absolutely be more visible, it could e.g. show up in the field if you try to press continue instead of that "Give you social security number" what it now shows.*"

R_06: "*The checkout was very nice otherwise except for that you could not choose payment method before entering your social security number, that was a bit odd. I have not experienced this in other places; normally you can pay by e.g. card or bank payment without giving up your social security number.*"

"*It should work so that if you press continue the fields for filling in your information without social security number should appear automatically as then it would not require the user to find the separate function for it; that would be user friendly*."

R_07: "*Putting in the social security number before (choice of payment method) gave me the conception of that invoice is the only payment method available since it said it is for that use.*"

"*I don't experience it as reasonable to put that social security number there at that point if I e.g. want to pay by card or whatever else. Only after that if I want to pay by invoice this information should be asked from me.*"

"*From the customers point of view, especially on the Finnish market, I don't experience this invoice solution to be always good. In a real situation it would have been a bit sus-*

picious that for what do they now need my social security number as it is quite protective information that is connected to your own identity."

R_08: "*It was weird that you had to put your social security number there, that I don't preferably want to do anywhere. Luckily I then found the spot where it said that "Do you not want to give…*" … "*I wanted to pay by credit card, and I wondered what they need my social security number for, I have not seen this thing anywhere else.*"

R_12: "*I was annoyed when I could not click on these payment methods and look at them. These could be the other way around so that I first could look at how and by what terms I want to pay and then give my information as required.*"

R_15: "*The checkout just all the time said to me that "so that you can pay by invoice" but when I do not want to pay by invoice how can I change it to card! In a real situation I would have left because I couldn't find out how to pay for my products.*" … "*If the customer already has made the purchasing decision I would say that the dumbest thing you can do is to sabotage the payment. During the way to payment there are many points where the customer may turn away but now when I finally have come this far and want to pay with my wallet open you don't accept me*."

Product variations hidden behind one product

The other major issue discovered regarding the UX and usability of the site appeared as a result of "Task 2" where the respondents needed to find the 55mm long stainless decking screw; only one respondent (R_01) found the correct screw; post-session the respondent said that it was completely by accident that the screw was found. The respondent had already given up and only clicked on some screw randomly and ended up on the right product page where the length had to be selected before the product could be put into the shopping cart. The problem with finding this specific screw turned out to be the fact that product variations like e.g. different lengths or package sizes of the same product can be chosen by the user only then when they open the product page from a category page or search results; there are no indications on the product in the listing on the category or search result page that the product can be bought also in e.g. different length variations. The respondents spent a lot of time and effort on trying to find the correct screw without succeeding; this is also seen e.g. in the heatmap in Figure 21 as

well as in Figure 32 below where there has been a lot of visual attention on the product headings and subheadings. This issue could easily be fixed and therefore also the UX improved by changing either the text on the green button that now says, "READ MORE" to a clearer indication that says e.g. "SEE ALL SIZES" or by making all variations to separate individual products.

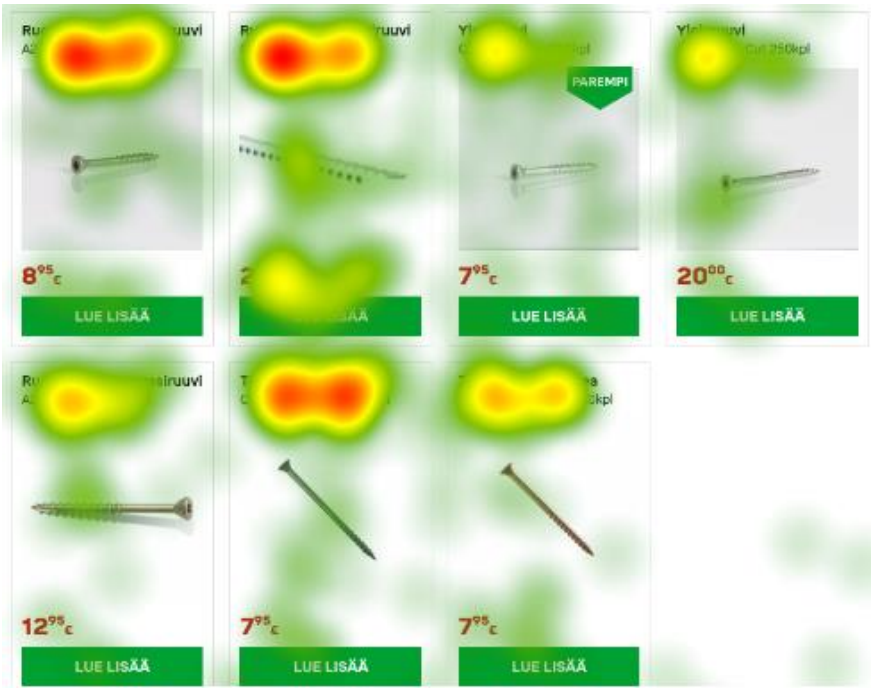

Figure 32: Usability issue on screws

Some comments from the post-session respondent interviews regarding this finding is shown below:

R_01: "*It was impossible to find the screw and I then found it completely by accident. If the product would e.g. only be named "stainless decking screws" without any specifications in the sub-heading, already that would be a better indicator towards that clicking on it reveals the options. If you are not as a customer able to buy the product you need even if the product is somewhere on the page, but you can't find it, it is not a very good thing.*"

R_03: "*It was impossible to find the 55mm long screw from there in the format it was supposed to (stainless), it generated problems for me."*

R_06: "*E.g. about the decking screws so instead of having them all hidden behind one product they could all be shown as individual products, at least in that way it would be easier and faster to find the right one.*"

R_08: "*The decking screws could all be shown as single products in the product list so that they could easily be found in the right length. Overall I think that the "READ MORE" button is completely unnecessary since it goes to the same place as otherwise clicking on the product and does not give any additional information. I don't think there normally is that kind of a button beneath every product on other sites.*"

R_09: "*I wanted to find brown stainless decking screws but I couldn't so I would have had to go to another store to get them." … "Anyone can't possibly find that screw from behind there, I also even tried the search field but didn't find it that way either. It could be presented as in IKEA e.g. where there is shown a "starting from" price e.g. on mattrasses and then it states that "click here for more sizes" or something like that.*"

R_10: "*I did not find the screw that I wanted so I now then just picked some other that I thought was close enough but in a real situation I would have left because of this.*"

R_14: "*Some small problems occurred when trying to find the screw. I got lost all over the place when searching and filtering and finally I then gave up and concluded that the screws do not exist.*" … "*In a real situation that would have been it, I would have left and got the screws from elsewhere*."

Minor UX issues (general)

The home page banner

Some respondents said that the banner did not catch their attention very well since they found the message on it to be too general and uninteresting; this finding is also supported by the fact shown in Table 7 that only one respondent clicked on the banner promoting flooring in "Task 1" where the need specifically was to browse floorings. According to some respondent comments the banner would be more attractive if it showed e.g. real products and some discounted prices or if it had a clear button that calls to action. Some

comments from the post-session respondent interviews regarding this finding is shown below:

R_08: ”*On the front page I did not really understand the idea behind these, what do you call them now, banners or elements. I didn't really get what was meant with the information on the banner, there could perhaps be some button that would say e.g. "Press here to see our flooring!" or something.*”

R_09: “*I would not honestly even start reading these elements here like this I would rather skip right off too finding products, here (on the home page) could be best offers and that kind of straight to business style. Something like "Now these only from us!" or "Most visited building materials" or some seasonal products promotion could work better. These kind of marketing messages are important to the company, but the customer doesn't think that way, those are easily ignored.*”

“*Immediately if there would be some price that refers to a flooring offer then I would think that hey this concerns me; but that one about a larger flooring selection is too generic."*

Top-menu not following scrolling

The menu at the top including the categories and filtering alternatives on category pages does not move along with the user when scrolling down and a second interaction with the menu element requires the user to scroll all the way up again. A better UX would be provided easily by making the top-menu and the filtering alternatives move along with the user when scrolling. Some comments from the post-session respondent interviews regarding this finding is shown below:

R_01: “*I did not like when the menu element at the top always disappeared when I scrolled down, it should absolutely move along when scrolling.*”

R_08: “*The filtering options could follow along when scrolling downwards so that you would not have to go all the way up every time. In that sense the site felt a bit outdated.*”

The search function

When observing the respondents during "Task 2" it several times occurred that the respondents pressed multiple times on enter after typing something in the search field; the reason was clear as the search field generates results quite slowly compared to other commands on the site and the search field does not either give any indication about that the search is in progress. The return of search results could also be more accurate in correlation with the search typed in according to some respondents. Some comments from the post-session respondent interviews regarding this finding is shown below:

R_02: "*The search function did help with finding the products, but it was not always on top of thing so to speak since it showed me some sauna stoves when I searched for stainless screws.*"

R_08: "*When I typed in decking board in the search field and pressed enter nothing happened, so I pressed again since I thought it did not register the first enter press. In my opinion when you press enter it should move away from the predictive search thing so that I know that something is happening. Many sites have e.g. so that it shows only grey boxes as an indicator that results are soon showing up.*"

R_14: "*The search motor did not respond as fast as I would have liked it to … it was an easy way to start since we live in this world of Google nowadays and maybe choose the lazy way easily instead of going through nice category menus … but however, it was painfully slow.*"

Sensitivity of drop-down

It occurred when watching gaze replays and observing the tasked eye-tracking sessions that some respondents had problems with the sensitivity of the cursor in the drop-down menu. There was too little margin for error when moving the cursor within the drop-down which made it disappear very easily if the cursor was slightly of path. It would be good for the UX of the site if the drop-down was a bit more forgiving to the user regarding cursor movement. Some comments from the post-session respondent interviews regarding this finding is shown below:

R_06: "*When you moved the cursor on top of e.g. the "Indoor" category and from there wanted to move along to "Laminate flooring" within the drop-down menu the drop-down just suddenly disappeared and when you tried again it disappeared again.*" … "*There is really no point in having a drop-down if it just keeps disappearing if the user somehow is "too slow" moving the cursor."*

R_07: "*The category menu was nice, but I however made one remark that when you moved the cursor on top of a certain category and the drop-down automatically showed then when you tried to move the cursor it somehow did not respond at first and just disappeared; it bothered me a bit.*"

Minor UX issues (category pages)

Filtering option "Color" for floorings

On the category pages for different floorings like laminates, parquets, etc. there is now no possibility for the user to filter the products to be shown by color. When browsing for new flooring it could be nice for the UX to be able to filter out all black and brown floors if you e.g. are in the hunt for a white or grey floor. Some comments from the post-session respondent interviews regarding this finding is shown below:

R_02: "*The laminates did not have color as a filtering option, that is something I felt I wanted since there now were so many options showed.*"

R_11: "*Regarding the floorings it would be very important to be able to filter on different colors…The color plays a big part when choosing a floor and now there was six pages of laminates I think, and I would not have coped with that.*"

R_12: "*When I wanted to browse floorings I easily found the floors but then I was not able to filter by choice of color even if I did try to look for it.*"

The "Decking board" category

In the category menu there is a main category called "Building and wood" (Rakentaminen ja puutavara) there is a category called "Wood" (Puutavara) which has a subcate-

gory called “Decking board and fence boards” (Terassilauta ja aitalaudat); however, within this category it only shows one decking board in the product listing even if the selection of decking boards in Byggmax is around ten different products. All of these should of course be listed in this specific category since already the category name indicates that the user will find them here. Some comments from the post-session respondent interviews regarding this finding is shown below:

R_04: “*In the second task it was disturbing and misleading when the decking board was not found there in the category called “Decking boards” but was again found when I continued to search for it elsewhere.*”

R_06: “*When you pressed the “Decking board” category it only showed three products for some reason, it should of course in that category show all decking boards that are available. I then had to turn to the search field to get more options visible.*”

R_07: “*There in the second task I did not find the decking board in the category for decking boards. I wondered that why is here only three products since it felt like a really small amount; I then just had to type it in (search field) and then it showed lots of products like it should have already in the category.*”

Uniform product pictures

E.g. on the category page for laminate flooring where all different options are shown side by side in the product listing the pictures used should follow the same pattern throughout; now the product pictures vary from close ups to landscape pictures. For the user it would be the most user friendly if e.g. all laminate floors would be presented on the category page listing with an identical picture where only the pattern or design varies. Some comments from the post-session respondent interviews regarding this finding is shown below:

R_08: “*I wondered why some floors are shown here with this kind of landscape feeling picture and others again in this kind of normal way. All of these floors should be shown in a similar way and for me the most informative is this kind of close up from above.*”

R_09: "*The way the products are named and what kind of pictures they are shown with is a bit bad here (flooring). Somehow they should be identical in style so they could easily be compared. They should all be shown in the same way, from the same angle, in the same light and in the same proportion so that the also visually would be easy to compare.*"

R_12: "*When I browsed floorings it bothered me that some had this kind of in-house (landscape) picture and others again had a normal picture. In my opinion it would be more sensible to keep it in line so that all are shown here (category page) in this normal way and then on the actual product page this in-house picture (landscape) is found*"

Minor UX issues (product pages)

Product suggestions

The site does not suggest to the user any products that could be useful together with another product or show these kinds of suggestions like "People who bought this product also bought these" etc. For the user it would be very valuable to get suggestions of compatible products as well as other products one may need like accessories e.g. In the context of this research e.g. in "Task 2" it would have been very valuable to get on the product page of the decking board needed a suggestion of the most compatible screws for that specific board. Some comments from the post-session respondent interviews regarding this finding is shown below:

R_07: "*There when I was buying the decking board I looked if there would have been that kind of thing where the site suggests some products automatically to me that is usually bought together with decking board; so I scrolled down the page to see if there would somewhere be the screws given directly as an alternative already.*"

"*Usually when you buy decking board you also need screws so a function like this would at least guide me towards buying them at the same since I personally want to get off easily but now I then had to separately go out and search for the screws when there was not that kind of function that is seen on many websites like "People who looked at this also looked at this and that"."*

R_13: "*In my opinion the site could have this kind of, what do you call it, bundle buying I think, like customers who bought this also needed this etc. You know, with flooring you need underlay foam and with decking boards you need screws and so on. In a way a suggestive shopping cart of some kind.*"

R_14: "*I like to be reminded of what I could need together with something else as long as it is not too much and that it is precise and well targeted, there could definitely be these kinds of things here.*"

Amount changing

When watching the gaze replays from "Task 2" as well as looking at the heatmaps in Figure 26 & 27 regarding the decking boards it occurred that there was a lot of gaze as well as mouse clicks in the area where the amount of the product can be changed. Checking how the function of changing amount works it appeared that by clicking on the two small arrows pointing up and down near the amount field the amount only changes one unit per click and does not increase if the user continuously holds down the click. So, to add 40 meters of decking board this function would require as many clicks; the way around it is by "painting" the number inside the field and using the keyboards digits to change the amount. Respondent R_15 also commented on this matter like this:

"*I wondered a bit about putting the 40m amount there since it did not really work easily like these kind of functions in my opinion should do. I hacked the mouse several times and it was not clear to me from the start that you can change the amount by "painting" it*".

Even if it did appear several issues and insights on improvement regarding the usability and UX on the site it must be kept in mind that overall apart from some exceptions the respondents were quite pleased with the site, its design, its interface, etc.; to support this claim some general positive and negative respondent comments from the post-session interviews are shown below:

R_01: "*The site's design and layout were clear, there was enough space between products and elements. The color world was OK and familiar Byggmax.*"

R_03: "*This was a very easy to use and clear website*."

R_04: "*The issues I encountered were not that disturbing that I would not come back to the site, but I could maybe tell if someone asks that there occurred some odd things."*

R_07: "*A really good first impression of the site and I liked that there were clear, large and well positioned elements and not almost any small stuff laying around here and there like there in my opinion was on the old page.*" … "*I would however, even if there were some problems, recommend this site for others since here were clear things and a lot of those kind of things that make it easy to use. Small things can always be fixed and in this UX there was not anything that would make me not recommend it.*"

R_09: "*Stylish, worthy and quality looking pages. I got a trustworthy feeling from them and they are clearly made in a universal style like many other web pages.*" … "*I would return to this site yes even though I did not get quite the feeling like I do from e.g. Clas Ohlsson or IKEAs websites where there for real is all information you need and pictures of products from many angles; a bit inadequate information on this specific site.*"

R_12: "*I think the site was a bit confusing, it was not that smooth finding the products. Somehow the categories were not clearly enough highlighted from the rest of the content.*" … "*In my opinion somehow that red and yellow color does not awaken trust in me since they are cheap colors and that does not usually affiliate with building.*"

R_13: "*The categorization was good in my opinion and there were not too much of them. The design was in my opinion in line with the Byggmax brand and I think the red color brings some dynamic buzz into it, it looks affordable but not too cheap.*" … "*The site speed and response were also on a normal level and yes, I would return to this site based on this experience.*"

R_15: "*Taking into account that I was not able to pay I think that if I would have a need in the future to order something from here I would not even take the time to try. However, I could still come back here to browse for products and then go to the physical store to buy it, yes in that kind of situation I would come back but not if I would have to order.*"

5 DISCUSSION

The purpose of this research was to use an eye-tracking device with tasked respondent sessions alongside respondent interviews for exploring the user experience and the visual attention of Finnish consumers on the re-designed e-commerce website Byggmax.fi. The aim was thereby to be able to draw conclusions regarding the sites present state as well as make recommendations on how the site could be improved in the context of user experience. A research approach using two tasked eye-tracking sessions in combination with post-session respondent interviews was taken to attempt to answer the three specific research questions raised in this thesis. The research questions were originally raised as a result of the author's pre-thesis discussions with key persons in the management of Byggmax.

As we can see from the results regarding RQ1 7/15 respondents did not see the large main banner at all and only one respondent actually clicked on it even if the banner correlated directly with the respondents' need of flooring in "Task 1". This result is a bit conflicting with the theory presented in section 2.3.2 of big elements better attracting visual attention as they communicate importance to the viewer; however, it must be kept in mind that the results could be different in a natural situation where any need-based task is not artificially simulated by respondents. Pictures and contrast colors naturally attract visual attention better than plain text so to use pictures and photos in website design near other content that is wanted by companies to be noticed is motivated (Bergström, J.R. & Schall, A. 2014 p.27-38; CXL 2013; Kucheriavy, A. 2018); as we can see from Figure 13 the main banner in this case though had a very neutral look and contained only plain informative text instead of really standing out in contrast to the other content which also may have affected this result. With this being said and considering the respondent comments on this matter, using the large banner area for more interesting

content that really stands out and creates interaction with the user's would be in the best interests for both Byggmax and its customers.

Considering the findings regarding the easiness of finding the nearest store it is safe to say that the address information to the users nearest Byggmax store is easily found already at this stage through Byggmax.fi even though some comments on how it could be even further improved did occur. Using pictures of other humans, especially human faces, is effective in attracting visual attention (Bergström, J.R. & Schall, A. 2014 p.27-38; CXL 2013; Kucheriavy, A. 2018) and on their old website Byggmax in fact used the face of each store manager alongside the store name at the top right on the site but as we can see from Figure 13 there is now only a red location indicator to the left of the store name on the new website. It could therefore be motivated to also use the faces here on the new site and also bring the address information a few clicks closer to the user as indicated by the respondents.

When looking at the results and findings as a whole and particularly for RQ2 & RQ3 they need to be put into perspective and compared together with both the FFF model and The UX Pyramid presented earlier in the theoretical framework of this thesis to be able to evaluate the usability and UX of the website. Regarding the FFF model the emphasis here has to be put on the second "F" standing for the filtering elements of security concern, privacy concern and trust. These three elements of security, privacy and trust are all highly emphasized by todays aware online consumers as these are the main elements consumers use to filter between alternatives online before finally making a purchase decision and eventually buying (Dange, U. & Kumar, V. 2012; Grabowski, P. 2017). The FFF model points out how crucial the major issue of asking for the social security number in the checkout is for Byggmax; evaluating how the respondents experienced the payment phase in the checkout it can be said that it neglects all of these three crucial elements of security, privacy and trust to some extent. Some respondents commented on this matter very clearly and sensibly in the post-session interviews which really emphasizes the characteristics of this evident problem. These examples of straight respondent quotes do not leave much room for interpretation; R_12 e.g. said: "*I was really wondersome with why I have to give my social security number here now when I want to pay by card or bank payment? Now I gave it here but in a real situation I would*

have left without giving it up.", R14 again said: "*This asking of social security number was then completely ridiculous…the only place I have encountered it before is online insurances like car insurance e.g.…In this case I did not see any meaning or reason for it and on top of it all it did not even let me proceed…this was a showstopper for me since I understand why you need to give up e.g. your address but then when it starts asking for annoying things like this I'm done.*" and R_15 finally made the real nature of the problem easily understandable by saying: "*If the customer already has made the purchasing decision I would say that the dumbest thing you can do is to sabotage the payment. During the way to payment there are many points where the customer may turn away but now when I finally have come this far and want to pay with my wallet open you don't accept me*.". The comment above from R_15 really puts it all in perspective and pinpoints the fact of how real and current the problem with the checkout actually is and that it also appears in the most crucial stage of the whole process sabotaging possible conversions by revoking the customers trust after the purchasing decision already has been made.

It is clear that users feel quite uncomfortable with how the checkout works in its present state around the social security number and to claim that it has a negative effect on a substantial number of customers user experience in a crucial stage of the buying process is not to exaggerate at all. It would without a doubt according to the result of this research be in Byggmax' best interest to make changes in the design and flow of the payment phase of the checkout as soon as possible. Changes should be made to the asking of social security number by having clearer indications on how to pay without giving up your social security number and explaining clearly why it is asked for or by starting the payment flow by first offering the user all available payment methods and then ask for the information needed accordingly based on the choice of payment made by the user.

In sense of The UX Pyramid presented in section 2.4.2 of this thesis it can be said that the UX of the Byggmax.fi website at the present time clears the first level called the *Functional* level; i.e. the website is accessible, it works as it should and as it was programmed to do without any faults or errors regarding key features. Likewise, the UX of Byggmax.fi also clears the second level in The UX Pyramid called the *Reliable* level meaning that the loading times are reasonable, the site can be used on different devices

and that the content is reliable and up-to-date. The third level called the *Usable* level is according to the results of this research the level to which the UX of Byggmax.fi at its present state is reaching for; it is not there just yet though. At this level the questions are; Can the website be used without difficulties and does the users easily find what they are looking for without getting distracted or confused? (Ralph, B. 2017; Korkishko, I. 2018). The answer to both of these questions according to the research in this thesis is no. As we saw with e.g. the payment, finding the stainless decking screw and the inadequacy of the decking board category in "Task 2" there are still several issues to be solved concerning these questions. By fixing the major and minor UX issues reported in section 4.4 under RQ3 & RQ4 throughout the website Byggmax will have the third level of The UX Pyramid mostly covered even if the site may contain issues that has not come to light during this research. To reach beyond "*The convenient chasm*" is not by any means necessary or required and therefore it is completely up to Byggmax as an actor within e-commerce to decide for themselves if the three first so-called objective levels are enough or if there still is desire left to pursue the more subjective levels called the *Convenient, Pleasurable* & *Meaningful* levels in The UX Pyramid. Ben Ralph (2017) emphasizes though in his blog post "*An Introduction to User Experience Design*" that budget-focused companies often stop at "*The convenient chasm*" after fulfilling level three and by doing so they shut themselves out from a number of beneficial outcomes that come along with more dedicated customers like e.g. improved customer loyalty, customer advocacy and customer spend. Thinking about the findings of this research and the line of business of Byggmax one thing that could help reaching beyond the convenient chasm is definitely the aspect of suggestive products and bundle buying. As R_07 said: "*There when I was buying the decking board I looked if there would have been that kind of thing where the site suggests some products automatically to me that is usually bought together with decking board; so I scrolled down the page to see if there would somewhere be the screws given directly as an alternative already.*" and R_14 said: "*I like to be reminded of what I could need together with something else as long as it is not too much and that it is precise and well targeted, there could definitely be these kinds of things here.*" it could be of interest to not only implement it but to take it even further by showing e.g. checklists or tips & tricks in connection with specific products; therefore making both the usage of Byggmax' website more convenient and the life of people who are not that familiar with building materials and accessories even easier.

6 CONCLUSION

The findings from the research conducted in this study has shown that the re-designed Byggmax.fi website offers its users a fairly good UX and has a good foundation regarding functionality and usability even if there still is a few major and several smaller issues to work on in order to reach a level where the users do not face any prohibitory obstacles or get confused nor distracted when interacting with the site. The two major issues reported in this study are of their kind such that they preferably require immediate processing from Byggmax; especially handling of the trust issue regarding asking of social security numbers in the checkout would be in the best interest of Byggmax and its customers since the findings clearly show that it is experienced in a very confusing and slightly negative way by Finnish customers in the most crucial stage of the shopping process. It is crucial to not annoy the users with usability flaws and to provide them with a UX where they do not need to work or think excessively in order to perform a task. As Jakob Nielsen from Nielsen Norman Group says (2012a); "*On the web, usability is a necessary condition for survival. If a website is difficult to use, people leave…There's no such thing as a user reading a website manual or otherwise spending much time trying to figure out an interface.*" This research was limited to only consider the visual attention and user experience on the Finnish e-commerce site of Byggmax but in future research it could be of interest to study these same topics in a larger case including also other websites from the same field. It would give a greater view and more insights on how others in the field of online retailing of building materials are presenting their website interfaces and UX's towards customers online.

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APPENDICES

Appendix 1

Master's Thesis - Pre-session survey

Ennakkotiedot

* 1. Vastaajatunnus

* 2. Sukupuoli

- [ ] Mies
- [ ] Nainen
- [ ] Muu

* 3. Ikä

- [ ] 25-30
- [ ] 31-40
- [ ] 41-50
- [ ] 51-60
- [ ] > 60

* 4. Olen asioinut Byggmax myymälässä...

- ◯ En koskaan
- ◯ Kerran
- ◯ Muutaman kerran (2-5 kertaa)
- ◯ Useasti (yli 5 kertaa)

* 5. Byggmaxin verkkokauppa on minulle ennestään...

- [ ] Täysin tuntematon
- [ ] Melko tuntematon
- [ ] Melko tuttu
- [ ] Hyvin tuttu

* 6. Kuinka kokenut verkkokauppojen käyttäjä olet?

- [ ] Ei kokemusta verkkokaupoista
- [ ] Vain hieman kokemusta verkkokaupoista
- [ ] Ostan verkkokaupoista muutaman kerran vuodessa
- [ ] Ostan verkkokaupoista kuukausittain
- [ ] Ostan verkkokaupoista useamman kerran kuukaudessa

* 7. Asumismuotoni on...

- ◯ Kerrostalo
- ◯ Rivitalo
- ◯ Omakotitalo/Paritalo
- ◯ Jokin muu (mikä?)

Appendix 2

Original task instructions

TEHTÄVÄ 1:

OLET UUSIMASSA ASUNTOSI LATTIAN JA OLET TULLUT BYGGMAX.FI VERKKOKAUPPAAN KOSKA HALUAT:

1) Selata eri lattiamateriaaleja ja vaihtoehtoja
2) Valita mieleisesi vaihtoehto
3) Löytää osoitetiedot lähimpään Byggmax myymälään koska haluat viimeistellä ostoksesi myymälässä sekä nähdä lattian luonnonvalossa ennen ostopäätöstä

Tehtäväsi on siis selata lattiavaihtoehtoja, valita mieleisesi lattia ja paikantaa lähimmän Byggmax myymäläsi osoitetiedot.

TEHTÄVÄ 2:

OLET LAAJENTAMASSA TAKAPIHAN TERASSIASI JA OLET TULLUT BYGGMAX.FI VERKKOKAUPPAAN KOSKA HALUAT:

1) Ostaa 40 metriä tuotetta ”**Terassilauta 28X95 RUSKEA**”
2) Ostaa yhden laatikon **55mm pitkiä ruostumattomia terassiruuveja** terassilautojen kiinnitykseen
3) Tilata tuotteet kotiin toimitettuna verkkokaupan kautta

Tehtäväsi on siis löytää yllä mainitut tuotteet, laittaa tuotteet oikeissa määrin ostoskoriin, jatkaa kassalle, täyttää kassassa tarvittavat tiedot ja valita sinulle sopivin maksutapa. Tehtävä päättyy kun maksutapa on valittu.

Appendix 3

Eye-tracking study on Byggmax.fi - Post-session interview questions

1. How did you like the new Byggmax.fi website? What was good and what bad in your opinion?
2. How would you describe the overall user experience? Was the site easy to use?
3. Did you encounter any problems or challenges on the website when doing the tasks?
4. What could be improved or what would you change on the website?
5. Would you return to the site or recommend it to others based on this experience?
6. Anything you want to comment or add that has not been asked from you or discussed yet?

Haastattelukysymykset

1. Mitä pidit Byggmaxin uudesta verkkosivusta? Mikä oli mielestäsi hyvää, entä mikä huonoa?
2. Miten kuvailisit äskeistä käyttäjäkokemustasi? Oliko sivua helppo käyttää?
3. Törmäsitkö tehtävien aikana haasteisiin tai ongelmiin? Mikä oli tehtävissä haastavaa?
4. Miten verkkosivua voisi mielestäsi parantaa? Mitä pitäisi muuttaa?
5. Palaisitko itse sivuille tai suosittelisitko sivua muille tämän kokemuksen pohjalta?
6. Onko sinulla jotain lisättävää tai kommentoitavaa joka ei vielä olisi tullut ilmi tai sinulta olisi aikaisemmin kysytty? Vapaita mielipiteitä.

Intervjufrågor

1. Vad tyckte du om Byggmax nya hemsida? Vad var bra och vad dåligt i ditt tycke?
2. Hur skulle du beskriva användarupplevelsen du nyss hade? Var sidan enkel att använda?
3. Stötte du på några problem eller utmaningar då du genomförde uppgifterna? Vad var utmanande för dig i uppgifterna?
4. Hur kunde sidan förbättras i ditt tycke? Vad borde ändras?
5. Skulle du på basen av denna upplevelse du nyss hade återvända till sidan eller rekommendera sidan till andra?
6. Har du någonting att tillägga eller kommentera som inte ännu kommit upp eller du inte blivit frågad kring? Fria åsikter.

Appendix 4

All respondent comments on the checkout issue

R_01: "*I knew from before from other web-shops that this kind of function ("Do you not want to give up your social security number?") does exist so I knew to look for it. The color of the text where you had to click is however too pale and definitely too hard to find especially for a person that does not even know too look for it*." … "*Then if you want to buy on invoice that should appear when it really is needed and not like this being there as first in the flow.*"

R_02: "*The checkout is however a bit unpleasant, like if I want to pay by card then I'm still first asked for my social security number. In a real situation I would have thought that here must be some error and then I most likely would have left." … "If that "Do you not want to give…" function would have been clearly visible I would definitely have used it; now I did not even notice it.*"

R_04: "*In the checkout at least I would first ask what payment method you want to use because there are payment methods available where you do not need to give up your social security number. Now I had to first put in my social security number, but I would most certainly myself first ask the payment method and after that the information required for that specific payment method. This is according to my experience the way it works in most web-shops.*"

R_05: "*Putting the social security number there did not personally bother me but there is of course a conflict when I know I want to pay the products right away by card or bank payment and not give my social security number for that; therefore I understand people that it does bother so much that they choose not to buy.*"

"*I order myself a lot from web-shops and this particular checkout does not match that what I am used to in web-shops and I do see a little problem here that I think will lead to some people jumping off; especially if you do not know Byggmax from before.*"

"*My supposition was that down here where it now says "Do you not want to give…" would be some terms of use or something or something so I did not pay any attention to it. That link should absolutely be more visible, it could e.g. show up in the field if you*

try to press continue instead of that "Give you social security number" what it now shows."

R_06: "*The checkout was very nice otherwise except for that you could not choose payment method before entering your social security number, that was a bit odd. I have not experienced this in other places; normally you can pay by e.g. card or bank payment without giving up your social security number.*"

"*It should work so that if you press continue the fields for filling in your information without social security number should appear automatically as then it would not require the user to find the separate function for it; that would be user friendly*."

R_07: "*Putting in the social security number before (choice of payment method) gave me the conception of that invoice is the only payment method available since it said it is for that use.*"

"*I don't experience it as reasonable to put that social security number there at that point if I e.g. want to pay by card or whatever else. Only after that if I want to pay by invoice this information should be asked from me.*"

"*From the customers point of view, especially on the Finnish market, I don't experience this invoice solution to be always good. In a real situation it would have been a bit suspicious that for what do they now need my social security number as it is quite protective information that is connected to your own identity*."

"*If I compare to other web-shops like e.g. Verkkokauppa.com I have to say that I do not get asked for my social security number as I enter my card details and pay my purchase. So, in that sense this does not awaken that much trust at all.*"

R_08: "*It was weird that you had to put your social security number there, that I don't preferably want to do anywhere. Luckily I then found the spot where it said that "Do you not want to give…*" … "*I wanted to pay by credit card, and I wondered what they need my social security number for, I have not seen this thing anywhere else.*"

R_09: "*The checkout asked like a bit odd information, there when it asked for the social security number I got a bit of a feeling that hey…and I now that especially for elderly*

people it can be even more of a hey wait what feeling…I know that some scammer can't do that much with this information but still I get a bit like goose bumps when its asked for since it is kind of a shady thing to ask for here."

"*I did not quite understand what it was asked for at that point but still it would not have made me quit since I do trust that it is for a good reason and I will get the product I want when I proceed with this…I did not still get a good feeling about leaving the social security number there…the essential thing is that if I pay want to pay the products there straight away the site does not need my social security number.*"

"*I think it is not in the best interest of Byggmax that some credit service is tried to be sold here. I would change this checkout system and if it is not possible I would change the provider. Someone might even get the impression that this is some hoax page since it does not exactly tell you what it is for."*

R_10: "*Giving up your social security number is always a bit bad; it immediately comes into mind that hey is it now safe to put it here?*"

"*It somehow asked me all the time for it when I wanted to pay even if I had not yet chosen how I want to pay. It said that if you want to pay by invoice you have to give it, but I could not proceed from there and change it without giving it up. It should have let me change directly to Mastercard without any social security number… in my opinion this does not work anywhere else like this.*"

"*That text about "Do you not want to give…" is printed too small since I cannot even see it. Maybe it could be in red, hmm no, I think this whole thing should change so that I first choose payment method and then if I pick invoice it asks for it."*

R_11: "*In the checkout the payment methods were somehow grey, and I could not click on them…I don't ever like typing in my social security number if I do not know what it is for. If I want to pay by card, where do they need my social security number? I luckily did find that small text down here about not giving your social security number and was able to proceed but I had to work on it for quite the time, I believe many people are very skeptic about this system.*"

R_12: "*I was really wondersome with why I have to give my social security number here now when I want to pay by card or bank payment? Now I gave it here but in a real*

situation I would have left without giving it up. If I would have chosen to pay by invoice or on down payment I would have understood why it asks for it. I usually always pay by card or bank payment and I know it is not needed for those, so I don't want to give it up unnecessarily since you never know on the internet where it ends up."

"*I was also annoyed when I could not click on these payment methods and look at them. This could be the other way around so that I first could look at how and by what terms I want to pay and then give my information as required.*" … "*I did not see that "Do you not want to give…" at all and I think it should be together with the social security number field."*

R_14: "*This asking of social security number was then completely ridiculous…the only place I have encountered it before is online insurances like car insurance e.g.…In this case I did not see any meaning or reason for it and on top of it all it did not even let me proceed…this was a showstopper for me since I understand why you need to give up e.g. your address but then when it starts asking for annoying things like this I'm done.*"

"*The time of asking it was illogical in my opinion since in other places it works in another way completely and that is like the very last thing you ask for in some cases…I would recommend someone to really think about this order of asking one more time.*"

R_15: "*In the checkout the beginning went very well but then when I was going to choose my payment method I started to hack on the grey area since I wanted to pay by card but it did not let me change and just asked for my social security number all the time…I then got stuck there and just thought that what the **** and left.*"

"*The checkout just all the time said to me that "so that you can pay by invoice" but when I do not want to pay by invoice how can I change it to card! In a real situation I would have left because I couldn't find out how to pay for my products.*" … "*If the customer already has made the purchasing decision I would say that the dumbest thing you can do is to sabotage the payment. During the way to payment there are many points where the customer may turn away but now when I finally have come this far and want to pay with my wallet open you don't accept me*."