Analyzing the Relationship Between Website Design and User Trust and Attitude

By

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Abstract

Websites can be the first encounter a consumer has with a business. There is a relationship between a website's design and the user's trust and attitude towards that website. To learn more about that relationship, a survey was sent out to the students at Natchitoches State University to review the design of two different websites. The survey contained 14 Likert-based questions on a 1 to 5 scale that asked the users their opinions on different factors of a given website. There is indeed a relationship between website design and user trust and attitude, a website with better navigability and ease of use being more trustworthy and giving users a more positive attitude.

Acknowledgements

I would like to thank the professors Dr. Picht, Dr. Perez-Mira, Dr. Travillian and Dr. Cochran for helping me create my thesis and sharing the survey with other students so I could complete my thesis. I would not have been able to finish my thesis without their help. I would also like to thank my family and the friends I made along the way.

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Chapter 1

Introduction

The purpose of this thesis is to examine the user's response to visiting an online-based store for the first time. The reason for examining user response is to see whether these first impressions will have a lasting effect on the user. One possible effect could determine whether they return to the website or not. Another effect could be to increase the trust users have on the website they visited or lower the user's trust instead. This thesis provides insights on how consumers form their attitudes and online shopping intentions, comparing results to those in previous studies. The research of this type of study can help retailers and marketers to better serve and attract consumers to shop online by better managing customer expectations and the online shopping experience.

This thesis is about retail-based websites. The reason why retail-based websites were chosen is because I would like to see if website design affects customers when shopping online. Research subjects were given a survey and asked to navigate one website. One survey is given to the user for two different websites, including two links that will allow the user to choses one website to review. One website was easier to navigate and read, while the other was harder to navigate. This was determined by

research on which website had better design than the other. The subject had only had to review and answer questions about one website. Two websites were used to show a clear difference in responses to a website with a good quality design and a website with a low-quality design. If there is a relationship between users and website design, the website with better website design will have more positive responses in comparison to the website with a lower quality design.

To gather information on user interaction, a survey was given to people in order to participate in the thesis. The type of survey that was used in a 5-point Likert scale. The type of survey that was chosen is a Likert scale because this type of survey is commonly used in order to gather opinions on certain topics without needing the user to give a descriptive input, and instead respond with the 5 choices given. After collecting the responses for both websites, the results will be compared with each other.

Studying the interaction between customers and businesses is important because these websites are increasingly important for commerce to happen. From this thesis I hope to prove that it is important for e-commerce businesses that users can accomplish any task while visiting their website. This allows new customers to have positive experiences with the website. It is crucial that visitors do not feel frustration while using a website. This thesis aimed to prove that if users are frustrated with a website for the first time, their negative feelings for the website might continue the next time they visit, or they might look for another website to make purchases.

Examining the relationship between new users and website design is important because it can help improve online business. By giving users accessible websites that are

easy to use, businesses are more likely to get them to return for repeat purchases. Customer retention is an important goal for any business that engages in e-commerce (Pine et al. 1995, Reichheld and Sasser 1990). If users spend more time on a website, they are more likely they are to purchase products from it (Pine et al. 1995, Reichheld and Sasser 1990).

Chapter 2

The impact of web design on user experience can be studied in different ways. The tool used in this thesis is the technology acceptance model. Along with the TAM model, factors of web design will also be discussed.

The Technology Acceptance Model

The Technology Acceptance Model (TAM) is a widely used model in information systems to determine the trust levels in different categories of technology. TAM was proposed in 1989 to explain a potential user's behavioral intention to use a technological innovation (Younghwa, 2003). This model is based on the theory of reasoned action, which is a psychological theory that attempts to explain a user's behavior and intention (Y.J.,2017). The TAM model can predict trust and acceptance by comparing several different variables, for example perceived ease of use and perceived usefulness. When users are given a survey to answer based on the design of a website, the questions are based on these variables. To determine the factors of trust for a product, users are asked to rate the products on a six-point Likert scale (more information on Likert scales is in chapter 3). Some examples of questions that will be asked to determine trust include (Allen, R.,2020):

1. Using this product at work would help me complete tasks faster.
2. Using this product would improve my job performance.
3. I would find this product useful at work.

TAM has four major variables that are used to determine user trust: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Behavioral Intention (BI), and Behavior (B). PU is both an independent and dependent variable that is predicted by PEOU and predicts BI and B. PU also refers to the user's view on how useful a specific technology will be and how much the user believed it can improve the efficiency of completing tasks over a period of time (Neil, 2016). An example of PU is if a user's decision that using Amazon will increase their efficiency of shopping for products online. Perceived ease of use is defined as the amount of effort required to effectively use technology (Davis 1989).

PEOU relates to the user's assessment of whether the technology can be learned without difficulty or not (Neil, 2016). An example of PEOU is if the user believes that navigating amazon takes too much time in comparison to the time it takes for the user to usually shop on another website. While PU is how useful users believe the technology is, PEOU is how easy it would be for users to use the technology given. PEOU influences PU, while PU does not influence PU (Davis 1989). Both PU and PEOU influence BI.

Behavioral intention is the user's intention to use a specific technology. Behavior is measured by frequency of use, amount of time a technology is used, the actual number of usages, and diversity of usage. The difference between PEOU and PU is that PEOU measures how easy someone can use the technology, while PU is the extent to which someone believes the technology would be. Both affect the behavioral intention to use technology (BI), but PEOU also affects PU (Y.J.,2017). My survey questions measured perceived usefulness, perceived ease of use, and trust.

According to Davis (1989), perceived ease of use is the degree to which a person believed that using a system will be free of effort. Because using a website to make purchases can be daunting for new customers, it is important for a website to be easy to use and not use too much of a shopper's time. For example, if a website has poor formatting and long download times, a user might look for another website to make online purchases. Perceived ease of use affects perceived usefulness. Perceived usefulness is defined by Davis (1989) as the belief that by using this application, the user's performance will increase. Perceived usefulness influences the intention to use online shopping, and perceived usefulness also influences trust.

For an example of using the TAM variables to determine use and trust, I will use the website Amazon. If a user wants to determine how useful Amazon.com is, they will visit the website and learn how to use the site. They are presented with factors of the website (for example, the search bar and product recommendations). While shopping on the website, they determine that it does not take long to know where to find and purchase products (PEOU), and that the website is very useful for shopping online (PU). This means that they will have a positive attitude towards the website, and they would be more likely to return to the website and continue to use the site (BI). Studies that use the TAM to determine user attitude can be seen in the literature review.

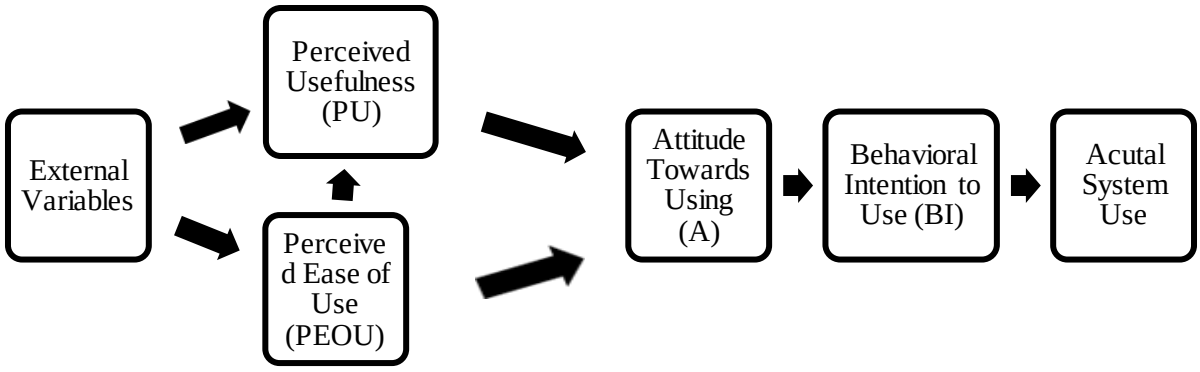

Figure 1: The Technology Acceptance Model based on Davis (1989). (Sauro, 2019)

Examples of perceived ease of use are the designs of websites. Factors of a website I asked about in my survey are information design, visual design, and navigation. The user's opinion of these factors will affect their perceived usefulness. For example, if the user finds the navigation of a website to be difficult to use and it takes too much time to navigate a website (the perceived ease of use), the user will believe that the website will not be very useful (perceived usefulness) (Sauro, 2019).

Trust is an important factor when shopping online. According to Castelfranchi and Tan (2002), online shoppers will not engage in a transaction online unless they have a certain level of perceived trust. People who frequently shop online and spend a lot of time on the internet will more likely have a high level of trust compared to those who don't. This is because they have a higher understanding of the potential risks of using online shopping. If shoppers also have a high level of confidence with the online site they are using, the level of their trust will increase as well. A well-known brand also might affect a customer's trust and intention to use a website (Castelfranchi, C., & Tan, Y. H. 2002).

TAM has been applied to predict and explain technology acceptance in electronic banking, mobile education, and e-commerce as well (Younghwa, 2003). A limitation of TAM involves self-reported usage, where instead of measuring actual usage, studies measured the assumption of usage (Younghwa, 2003). This method exaggerats the relationship between independent and dependent variables. Another limitation stated by Younghwa (2003) is that studies usually examine only one information system with a homogenous group of subjects on a single task at a single point in time, which causes generalization in the results of a study. A third known limitation is that instead of measuring the subjects over a period of time, there is no longitudinal comparison, which does not show possible changes in user perception (Younghwa, 2003).

Website Design

According to Kairi Fimberg and Sonia Sousa (2020), there are several factors of a website that affect trust. These include visual design, content design, and social cue design. Visual design is the graphical design aspect and the structural organization of displayed information on the website. Some examples of visual design include professional design, color scheme, readability, navigation, and no technical problems. Technical problems include slow loading times, broken links, and not being optimized for mobile versions. Content design is the informational components that can be included on the website. Examples of content design are logos, company information (an "about" page), clear policies, and external links. Social-cue design relates to any social presence and face-to-face interaction. This includes reviews, social presence, and easy to access customer service.

Navigation is an important design element, because it allows users to acquire more of the information they are looking for while making the information easier to find. This means that in order to make a usable website, it is important to create good links in navigation (Palmer, J. W. 2002). Navigation is important due to the fact that a customer is not guaranteed to know how to find everything contained on a website and will possibly need to search the website in order to find the product they are looking for. Other qualities that help improve website usability are graphical design and layout.

Graphic design is creating visual content in order to communicate messages. Graphic design applies visual hierarchy and page layout techniques to help optimize user experience. Graphic design involves using the layout of a website. The layout is how the website arranges and displays information (I, 2021).

A website with good usability should create a desirable perception of use and an intention to use on the site (Palmer, J. W. 2002). Perception of use and intention to use are terms used in the Technology Acceptance Model, which refer to how much a user believes that using a technology would improve their performance and how much a user intends to use this technology. Usability includes consistency and the ease of getting the website to do what the user intends it to do, clarity of interaction, ease of reading, arrangement of information, speed, and layout. Useful design of user interfaces includes organization, presentation, and interaction (Palmer, J. W. 2002).

Carlos Flavián, Raquel Gurrea, and Carlos Orús (2009) look for the key factors in website success. They state that website design has been a key factor for the acceptance and success of websites and electronic commerce. They analyze from a marketing point

of view the main aspects that could influence online users' perceptions and behaviors. The purpose of their study is to achieve a successful e-commerce website. The authors aim to know what are the main factors that affect the success of e-commerce websites from a consumers' point of view, and which are the main features of a well-designed website.

Flavián, Gurrea, and Orús (2009) state that usability studies what elements must have a website so that the consumer can manage it easily. Nielsen (1994) defines usability as the ease at which the user can learn to manage a system and memorize the basic functions of a site. Usability is a quality attribute that assesses how easy user interfaces are to use, and there are five dimensions of usability: learnability, efficiency, memorability, errors, and satisfaction.

Usability can also be understood as a tool for measuring the quality of a website. This means usability improves the best understanding of the contents and tasks that the user has to know in order to achieve a goal. This also reduces the probability of error and improves the levels of trust. Usability is also related to the user's ability to identify where he or she is and what to do in every moment (Nielsen, 1994).

Flavián, Gurrea, and Orús (2009) also mention that the managers of the website should make an effort to offer navigation that is simple, and also allows for customers to have a certain degree of freedom. The possibility to enjoy free navigation leads to customers having more positive outcomes, higher satisfaction, and higher purchase intentions. The addition of sophisticated search engines in websites is a key aspect in improving the user's opinions of a website.

An example that the authors used for an efficient search engine is the online store Amazon.com. This is because Amazon's search engine allows users to search for products in every page of the website and offers advance search functions for product categories and subcategories. Another example that the authors used is the website Dell.com. On this site, users would be able to know where they are at every moment of the navigation. Additionally, the shopping process is displayed in four simple visual stages. Websites should also have a good level of download speed because longer download time could lead to users leaving or avoiding the website (Flavián, Gurrea, and Orús, 2009).

The appearance of a website also has to be considered when achieving a successful website design. This is because the first impressions of a website determine user evaluation of that website, and this influences their perceptions and behavior. The study by Liang and Lia (2002) also concludes that customers are more likely to make purchases on well-designed websites.

Another key aspect according to this study is the information related to the shopping process. This means that designers should pay attention to the information quality related to the products and services supplied on the website, and to also offer any additional information that could be useful for the consumer. An example of displaying useful information would be the website Clickair. This is because Claickair offers not only information about the conditions of their flights, but they also offer accommodations at the destination, transport to the airports, or even the option to rent a car once the traveler has arrived (Flavián, Gurrea, and Orús, 2009).

Literature Review

Marios Koufaris has done a previous study to determine the relationship between user trust and web design. This article used the TAM model to determine if web design leads to users returning to the same website. When customers shop online, they perform certain tasks on a website that can create emotional and cognitive responses (Koufaris, 2002). These responses influence the customer's intention to return to the website, and customer retention is one of the primary goals of all companies. Because Koufaris used a questionnaire to analyze website users' behavior, intention to return would be an approximation of actual customer retention.

To find the reason why performing tasks online can create particular responses, Koufaris looked at user interactions with websites as both a store and system. One measure of responses is through shopping enjoyment. The author states that while shopping in the physical world can be a very enriching and emotionally fulfilling activity, shopping on the internet does not always provide the same experience because it is limited to mostly two-dimensional pictures and text. Several variables Koufaris considers determining what causes emotional and cognitive responses are product involvement, demographics, and web skills.

According to Koufaris, some factors that affect user's intention to return to a website are: shopping enjoyment, perceived control, and attention (Koufaris, 2002). Users are more likely to enjoy shopping if a website is easy to navigate, so users will be able to find what they want quickly. For an e-commerce-based business, if users are able to find anything they need to buy in a short amount of time, the enjoyment from shopping

from that website will improve. If users have to spend a large amount of time searching for anything they need to purchase, they will not have any enjoyment from shopping from that website.

Another factor Koufaris (2002) discusses is unplanned purchases. Sometimes when users go to websites to make specific purchases, they might make unplanned purchases. Some users make unplanned purchases on pure impulse, and this may arise from users' compulsion, excitement, and disregard for consequences. Another reason is that a stimulus reminds the consumer to buy a product they need, or because a website promotes the product (Koufaris, 2002). An example can be when a website recommends products next to the product the user has chosen. This might lead to the user viewing the other products the website has suggested. Another example is when a website shows the user items that are frequently bought together. This also might lead to the user to view other products that are different from the product they were going to purchase, and they might purchase other products because they feel they might need the other product as well (Koufaris, 2002).

Koufaris (2002) analyzes the effect that a specific online shopping experience has on users. Past studies indicate that shopping enjoyment has an effect on customer loyalty. Perceived control is also a factor that affects the responses users receive from shopping. Perceived control is the level of one's control over the environment and the user's actions (Koufaris, 2002). The author measures perceived control with a four-item scale.

Because online shopping users are also computer users, Koufaris (2002) uses the TAM model to determine the reasons why computer users adopt the technology for a

specific website. The TAM model has been used to determine user acceptance of word processors, spreadsheets, email, voicemail, and telemedicine technology. By treating an e-commerce website as a technology system and the shopper as a web user, the variables from the TAM model can be applied to see how well it predicts user intention to use the e-commerce website. The author also uses questions based on perceived ease of use and perceived usefulness with their survey because these two factors are used frequently from the TAM model to determine customer acceptance (Koufaris, 2002).

Koufaris (2002) states that by seeing how users respond to TAM variables that represent factors of websites, Koufaris will be able to find online shopping behavior. This is because by viewing the online store as a system, the TAM model can be applied to determine trust. Customers will believe that by using the website, they will enhance their shopping productivity (perceived usefulness) and if the website is easy to use as well (perceived ease of use), they will be more likely to return.

To determine if there is a relationship between user trust and web design, Koufaris (2002) uses an online questionnaire that was administered to web customers. The website Koufaris studies to determine if web design affects customer intention to return is Booksamillion.com, the online e-commerce site for the company Books-A-Million. Koufaris uses this website because the site is comprehensive and functional, it is relatively unknown so there would be guaranteed first-time-customers for the sample, and unlike websites like Amazon.com, Booksamillion.com only sells books as a focus. Thus, there would be less variance in product quality. For the survey, each subject is asked

whether they had visited Books-A-Million, and if they did, they would be screened out so only new customers would count for the study.

The users were instructed to visit Booksamillion.com and then immediately return to the questionnaire. They were then asked about their experience during that specific visit to the website. This is important because by having users report about using the website, the validity of the surveys would increase. The questionnaire contained 26 questions, ran for one week, and was completed by 300 subjects; and 280 subjects were new to Books-A-Million. Koufaris reports the percentages of different personal information and also reports the percentage of people who stated whether they intended to purchase books, or and whether subjects made any unplanned purchases. The survey indicated also whether the users were satisfied with their experience, with only 14 percent stating that they would not return (Koufaris, 2002).

The results of this study show how emotional and cognitive responses to online shopping can influence user behavior. For example, these responses can influence the user's intention to return or not, as well as cause unplanned purchases. Even though users are not expected to be entertained when shopping online, if they enjoy their experience on the website, they are more likely to return. By using factors from the TAM model such as perceived use and perceived ease of use, the study shows that factors such as shopping enjoyment and perceived control lead to customers returning to a website. One possible error from this study is not being able to determine the chances of planned purchases from returning customers, since this study only reviewed first time customers. The study

was not able to find what factors could determine whether first-time customers would want to make purchases on a specific website.

Kairi Fimberg and Sonia Sousa analyzed website design to determine how it affects user trust. In this document, the authors' goal is to see if there is a relationship between user trust and web design. They divided trust components into three factors of web design: content, visual, and social-cue design (Fimberg, Kairi & Sousa, Sonia ,2020). They collected data from an online experiment involving the websites of two Estonian furniture manufactures. The experiment is based on A/B testing.

A/B testing, also known as split testing, involves two or more versions of a variable that are shown to different segments of website visitors in order to determine which version leaves the maximum impact. Examples of factors of a website you can A/B test include headlines and subhead lines, navigation, layout, and design.

For the experiment, the users were given a questionnaire that contained four separate parts: first impression, design assessment, trust assessment, and final comments. The questionnaire also uses a 7-point Likert scale to measure attitudes, knowledge, perceptions, values, and behavioral changes for all questions. The participants were randomly assigned into groups, and the authors noted which participants shopped online regularly and which ones did not. Koufaris (2002) did the same in his study because skills in using the web can affect user choices on the survey.

The results of each website are displayed on two separate graphs (figure 1). One graph displayed the perceived quality of website design while the second graph showed

the perceived trust for each website. Based on the chart, website A is better designed and elicits more trust.

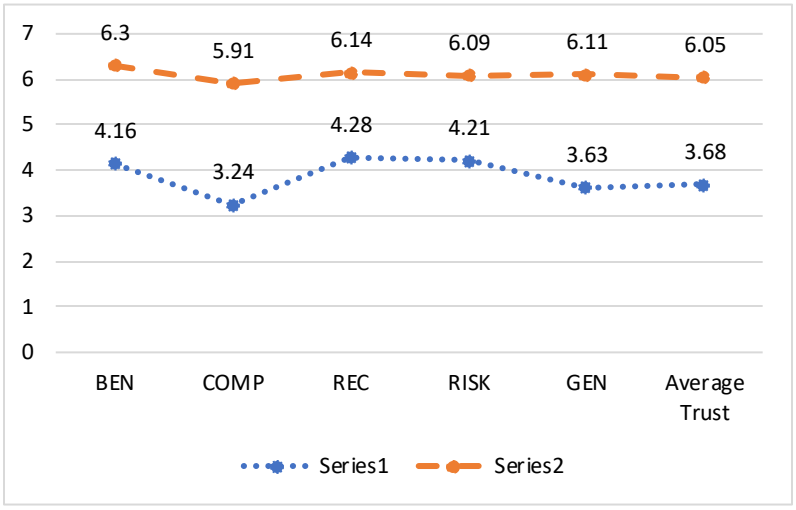

Figure 2: Perceived quality of website design in Website A and Website B (Fimberg & Sousa, 2020).

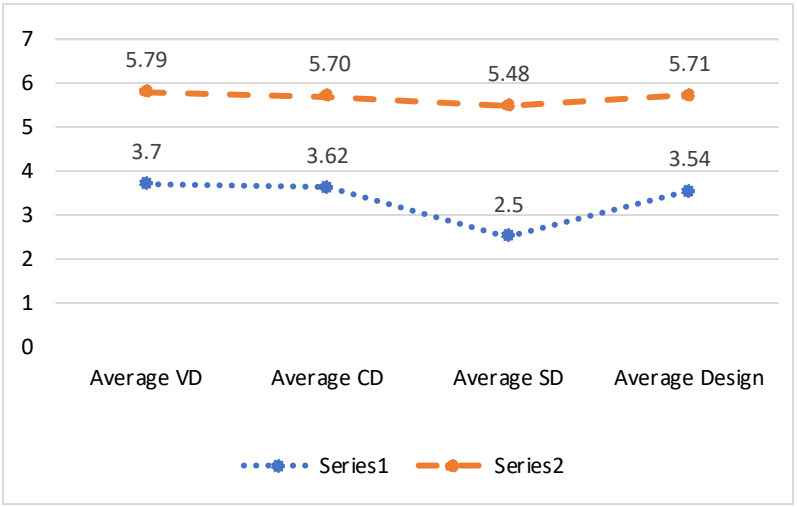

Figure 3: Perceived trust in Website A and Website B (Fimberg & Sousa, 2020).

One limitation of this experiment was the influence the websites would have on the users. Because the two websites used in the study each had sold different products, there would be a difference in influence of the first impression, trust, and how much a user would be likely to purchase products. Ideally, the products of both websites should

be similar with only the design of the websites being different in order to measure the impact of website design on user trust. The authors mention that further research might be required to see the importance of these components in different situations. For example, the user response might be different based on gender, age, and business field Fimberg & Sousa, 2020).

Liao Pei Wen and Jun-Yi Hsief analyzed the relationship between user trust and web design in order to determine online shopping behavior. In this experiment, the authors' goal was to analyze the online shopping behaviors of undergraduate students. In this study, the authors use the TAM model to create a survey to be given to users to answer questions about shopping websites to see if the website given would be trustworthy based on the user response (Pei Wen & Jun-Yi, 2010).

The factors the authors use for this experiment are perceived ease of use, perceived usefulness, trust, attitude, and behavioral intents for a total of 12 questions. Like Fimberg and Sousa (2020), the authors use a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree) for their survey.

By using the TAM model, the experiment would determine whether perceived ease of use would affect perceived usefulness and attitude and see whether perceived usefulness would determine attitude and trust. Examples of perceived ease of use in online shopping is the speed at which it takes someone to complete their tasks with little effort. If using a website to make purchases cost little in terms of effort (perceived ease of use), the user will believe that the application can increase their performance (perceived

usefulness), which will then give a positive attitude of the website and increase the user's trust of the website.

The researchers conclude that perceived ease of use has a significant and positive impact on perceived usefulness, and perceived ease of use has a significant and positive impact on trust in online shopping, attitude towards online shopping, and behavioral intentions (by using the chi-square test, the researchers found the p-value to determine if their hypothesis were true). Attitude also had a positive impact on trust in online shopping (Pei Wen & Jun-Yi, 2010).

One example of a factor that can affect the results of this experiment is whether customers are used to making purchases on the internet or not. If customers with high levels of trust and online experience know more about the details associated with purchasing products online, they behave with caution online. Additional knowledge about shopping online might affect a user's answers on a survey.

A factor that is always used in statistics is the sample size. The authors for this experiment stated that the sample size was small, and all participants were all from Taiwan, so the results might not be to be generalized for other countries and cultures (Wen & Jun-Yi, 2010).

Marianne Karisson studied the relationship between the design elements of web pages and perceived usability, perceived expression, and emotional responses. While finding the perceived usability of websites, which has been done on other studies with different web pages, this article is different from other studies because it looks for perceived expression and emotional responses, when others do not (Karlsson, 2007). This

article uses two different websites for the study, and each site has different content as well as graphic design, color schemes, and balance between text versus illustrations. This study also differs from others because it takes into account the balance of text and illustrations, which other studies do not mention when choosing websites to use.

Karrison states that past methods for evaluating product usability have been focused on performance and efficiency while the experience of use and how the design of a product and its interface influences users' perception of the product has not been a particular theme. This led the author to look for the relationship between web design and how it relates to user perception. Examples of design elements that the author uses for this study include layout, font, column width, image placement, empty space, and colors. For this study, there were only 20 subjects, which were 10 men and 10 women. Compared to several other studies when the number of research participants is usually around 100, there were not a lot of participants in this study. In the study, Karrison does not discuss the reason why only 20 subjects were used. Past studies have also only given out surveys for one website in comparison to two. The only criterion for this study is that the users should have experience using the internet. This is similar to Koufaris' study, where he asks the subjects if they have any knowledge in using the web or not (Koufaris, 2002).

The websites chosen for Karrison's study were www.santamaria.se and www.hansen.se because they were significantly different in how they display information on their web pages (Karlsson, 2007). Santa Maria Ltd was chosen to display the company's products and segments, which are spices, accompaniments, and seasoning.

Hansen's website is used for arranging events, conferences, and travels. Based on this information, the websites used vary in products, and even more than in Kairi Fimberg and Sonia Sousa (2020) because the two authors have chosen two Estonian furniture manufactures to compare. Like other studies, the author uses a Likert scale, but the scale was only 5-point with 10 questions.

Karrison concludes that the three main factors identified that contributed to the perceived expression of websites are: graphic design, content, and perceived usability (Karlsson, 2007). Karrison displays results in a graph (figure 3), the questions ask the subjects whether they agree or disagree on the topic of if the website is consistent, for example. Because the author is comparing the user's emotion based on website design instead of the intention to return, the use of two websites that sell different products would not affect the results of the survey.

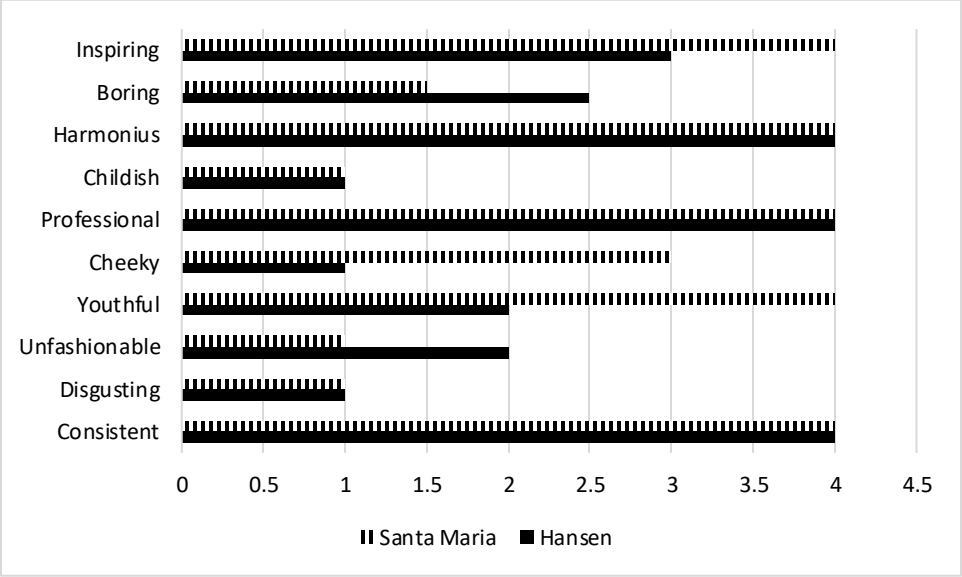

Figure 4: Subjects' agreements with statements regarding the expressions of the respective websites, from 1 = do not agree, to 5 = completely agree (Karlsson, 2007).

Sascha Mahlke examines how the experience of website usage can form an intention to use a website. Mahlke uses the TAM model to see if website qualities affect usage behavior (Mahlke, 2002). Past studies have also used the TAM model for website design, like how Koufaris uses the model to analyze customer behavior (Koufaris, 2002), but Liao Pei Wen and Jun-Yi Hsief used this model to analyze shopping behavior instead of usage behavior (Pei Wen, &, Jun-Yi, 2010). For this study there were 210 subjects used. This is greater than the number of subjects used in Karrison, but based on previous studies, it is not uncommon for over 100 subjects to be used. The questionnaire consisted of 24 questions that were designed to measure intention to use.

For the procedure, subjects were randomly assigned one website and were asked to execute a task given to them within 10 minutes. This study is different to other studies that analyze website usage due to giving users a specific task to complete within a time limit. After completing a task, the questionnaire is presented to the user. Similar to past studies, the author asks the subjects about their knowledge of using the web.

Punam Bedi and Hema Banati (2006) also assessed user trust in order to improve web usability. For the websites used, the authors chose three airline websites. A total of 50 users were chosen, which is the same number of participants in the study by Fimberg and Sousa (2020), but their study only consisted of 2 websites instead of 3. Bedi and Benati also had their subjects review all 3 websites in comparison to Fimberg and Sousa (2020), who had half of the subjects view one website and the other half view a different website. The number of subjects for this study is also small compared to other studies.

To simplify the study, only the home page of each website was used (Bedi and Banati, 2006). A total of 10 features were selected for this study: color combination, site information, affiliations, search facility, link names, link explanation, customization, page scrolling, online booking, and promotional aspect. After the users visited the websites, they were asked how much trust they would place on these sites. The users also voted on which of the three websites was the most trustworthy. Compared to other studies about website design and user trust, this study does not ask subjects to respond on a Likert scale, and instead the subjects gave the author's their opinion on each website and whether they found the site trustworthy or not. Some examples of their remarks are "very trustworthy" and "was put off by the site (Bedi and Banati, 2006)."

Beata Basinska and Marcin Sikorski also reviewed several websites in order to determine user trust, satisfaction, and loyalty (Basinska and Sikorski, 2014). The authors stated that this study differs from other studies because it combined user-based usability testing and questionnaire survey and is one of the first studies of this type regarding consumers on the Polish market. For this method, the subjects already had experience as an online service website user. Based on other studies about website design and user trust, it is likely that the users who take these surveys will be knowledgeable about using the web. The authors also had the criteria that the subjects would be experienced in making use of online banking, travel, or health services, while other studies did not have this requirement (Basinska & Sikorski, 2014). Because of the criteria, only 15 people would take the survey, which is not a lot of people compared to other studies (Basinska & Sikorski, 2014).

Characteristics that were taken into account for Basinska and Sikorski's survey are: visual clarity, ease of use, display of information, personalization, recommendations, and interactivity with the provider. These characteristics were evaluated using a 6-point Likert scale, where one is the lowest and six is the highest. For studies either seven or five are commonly used for Likert scales, and 6 would not include any indifferent response. The users were also asked about trust, satisfaction, and loyalty to a website (Basinska & Sikorski, 2014). To identify satisfaction and trust the users were given another six-point Likert scale. The study consisted of 6 websites, which is a large number of websites being used in comparison to other studies. The websites used consisted of two banking websites, two hotel booking websites, and two heath service websites. Each category of websites had one website with a different level of usability. By having websites with similar services, the users who take the survey can focus on usability instead of the different services (Basinska & Sikorski, 2014).

Limitations of this study include that the results cannot generalize the whole population of online services users. The authors also mention this is because the study involved only a small group of participants (Basinska & Sikorski, 2014).

Chapter 3

Websites Chosen

For my thesis, two websites I will compare are Homebase and Ikea. These websites both sell the same types of products, which are furniture and home decorations. While Ikea has been noted for good web design (Skeldon, 2022), Homebase has been said to not have good web design according to Skeldon, 2022. I chose Homebase for one of the websites I can review because it was one of the worst-rated e-commerce websites in a 2018 and 2019 survey (Skeldon, 2022). The reason is because of its design and limited stock quality. To find the furniture you are looking for, you have to scroll past trending suggestions then choose to shop by category or brand before finding a list of products to buy. Some categories do not have any products and the images for each type of product can be confusing.

Like Homebase, Ikea is a furniture company that also allows for shopping online. At the top of the home page, there are only a few topics to choose from. This allows the customer to not get overwhelmed by too many choices. In comparison, home base has 12 different types of products you can choose from on the homepage. This means it might take a longer period of time for a user to decide on where to go when using Homebase.

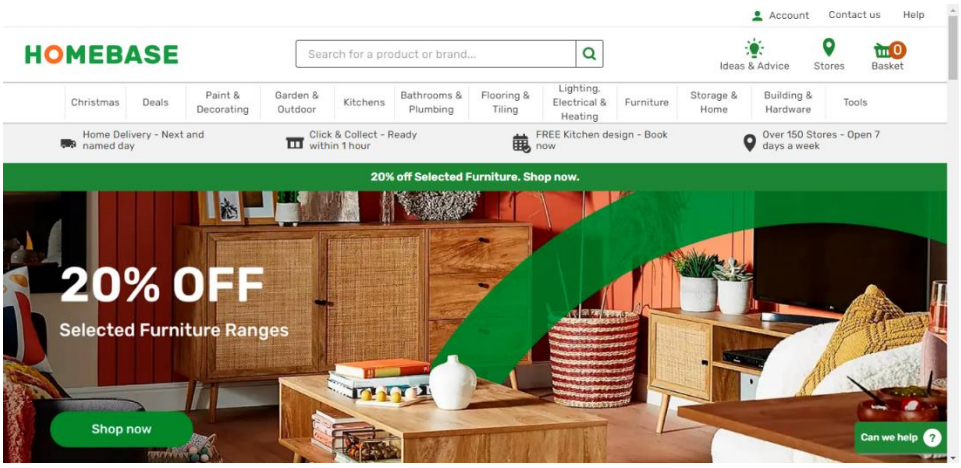

Figure 5: Homebase's front page

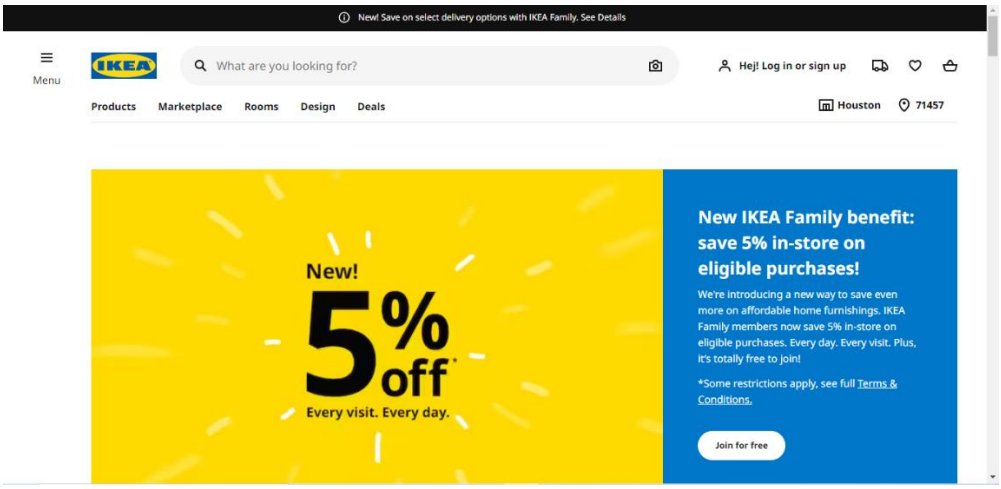

Figure 6: Ikea's front page

Similar factors of website design that both Ikea and Homebase have is having a search bar on the home page. This allows for users to have an easier time navigation to where they would like to go if they do not want to browse by topics. While browsing the different products on Homebase, there are two symbols under the product that will tell you if the product can be delivered or if it is in stores. From the browsing page, the website does not tell you what these symbols represent, so they might not be helpful to

the user. Under each product on Ikea's page, there are bullet points that will tell the user if the product is available for delivery or if the product is in stock at the location you have chosen. Because these statements are not shown as symbols but are instead displayed as sentences, there is a possibility that it will be easier for the user to understand while shopping.

One difference between Ikea and Homebase are the preview pictures that show when you move your mouse over the product. Ikea's preview will show the item in a setting, while Homebase will just show the packaging of the item instead. This might be helpful when searching for the product in stores, but while shopping online, these pictures help the user less. Some products at Homebase's website might not include a preview image as well, which can lead to confusion.

Ikea also includes a shopping basket icon under the product that allows users to add the product to their cart while they browse. Users can also favorite these products while browsing which gives the users a list of all the products they have favorited. When choosing either option, an alert will tell the user that the item has been added to the cart or favorited, while allowing them to check the cart as well. Homebase also has an option to save the product to a user's Wishlist, but this option can only be found on the product's page and not the search page.

Another difference that both websites have is the location of the filters for each product. Ikea's filters are displayed at the top as a drop-down menu, so the user is not overwhelmed by too many options. Homebase's filters are found on the left side of the website, and Homebase also displays every filter at once, where some filters cannot fit

every option in each section. Homebase also shows the number of products that are in each filter, so the user can see the number of products that fit each filter. Homebase's filters can be collapsed to see all the filter titles at once, but the filters start out un-collapsed unlike Ikea, which lets the user see all types of filters at once.

When choosing an item on Ikea's website, under the product there will be related products for the user to choose from. This allows users to look at similar products without needing to go back to the main page. Homebase does not have a way to show similar products under the product the user has chosen.

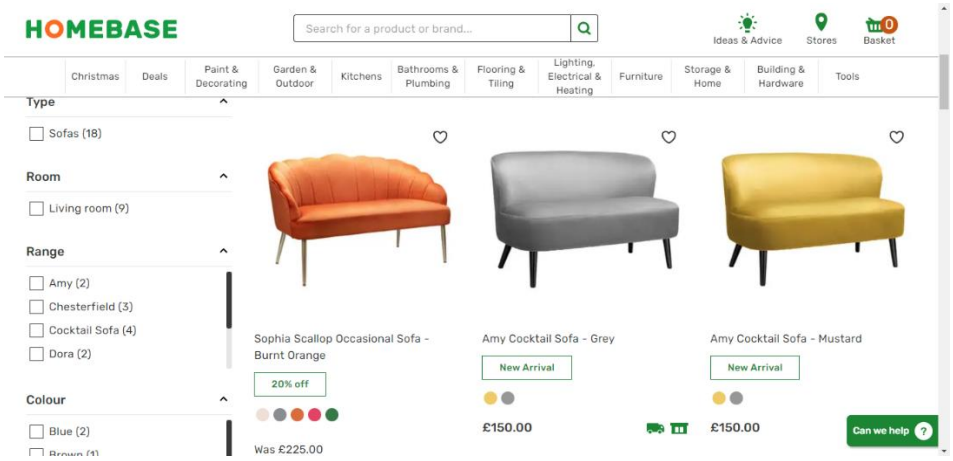

Figure 7: Homebase's page under sofas

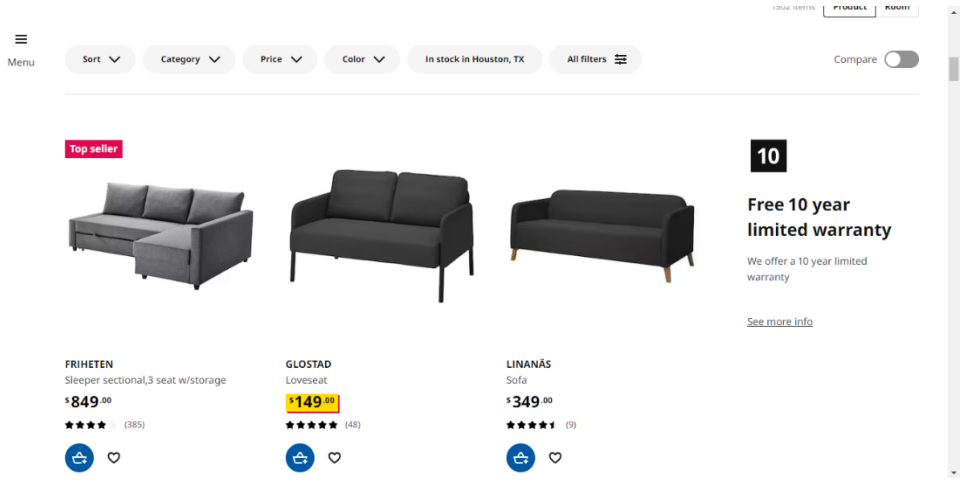

Figure 8: Ikea's page under sofas

There are different factors of web design. Palmer (2002) states that because of the increasing number of people starting to use the internet, it is important to measure what users want in a website. Websites are a primary user interface for any type of business that is done online. Developing sites that are responsive to user needs is important for all site designers and managers. In order for websites to be successful and leave a good impression on first-time users, Palmer (2002) also states that websites need to consider usability and other design criteria. Usability is important in order to have a successful website.

The usability of information systems is equivalent to a set of design principles, which consists of five elements. These elements include the consistency of the interface, the response time, mapping and metaphors, interaction styles, and multimedia and audio visuals. Consistency also suggests the need for common placement of navigational tools, for example, buttons and bars. For accessibility, it is important to make sure that websites show the clear purpose of each tool being used, or they will lead to confusion. When

given a slide to filter the different prices of products, there should be wording that informs the user what each side of the slider represents. It is also important to choose the correct tool for each function of a website. This is so the users will be able to be more efficient when completing tasks on a website (Palmer, 2002).

For consistency, the websites Ikea and Homebase both place their filters on the same side of the page no matter what type of product the user is searching for. Along with filters, the menus displaying the titles of different products stay on the top of each page. This allows for the navigation to always be in the same place, so that users will know where to go when they need to use any navigation tools. By using image buttons for filters, users will have an easier time navigating to more specific products. But image buttons can also be a disadvantage, because if products use the same image as a preview or example, it will lead to confusion. Another disadvantage of using images is if users are surrounded with too many images, users can become overwhelmed, and it will take the user longer to decide where to go.

When a visitor to Ikea's website visits the page for one type of room, for example kitchens, the site displays all options on the top of the page (kitchen appliances, drawers, and sinks) and below the page, it gives offers and suggestions to the user. On the website Homebase at the page for kitchens, the user is first greeted with offers and then can choose to shop by style, color, or brand. Even though this does not allow for users to quickly examine what the website offers to sell, users could be visiting these pages to browse instead of shopping with a purpose. This is because Homebase offers a search bar to use instead. If the purpose of the main pages of each product is for users to browse

different products and get ideas on what they might be interested in, it is sufficient to offer suggestions to users. It is also confusing as to why Homebase's option to shop by category is at the bottom of the product page away from the other options, which could be more useful at the top of the page where more users would be likely to see it.

Response time is based on the speed at which the system provides a response to user activity. Response time is also important to the usability of a website. If a website takes too long to load or process information, it might cause users to become frustrated, which will lead to the website becoming less trustworthy. If a user tries to sign up for a program or purchase a product and the website takes too long to load, the user might not think that the purchase went through and will have to check again, which leads to the user spending more time on the website to complete a task. This will lead to the user becoming frustrated with the website. Both Ikea and Home base have fast response times when searching for products.

It is important for websites to make sure their navigation is clear and easy to find so that users will spend less time searching for different pages of a website. Different types of products in a retail website would have different pages in a website. The user will have to find the navigation in order to look, say at one clothing for women and then change pages to look at clothing for men. Another example of navigation would be to include a search bar, which allows users to find any specific product under less broad terms. Metaphors such as shopping carts allow users to keep track of the number of products they are planning to purchase.

Interaction styles are system messages that are generated in response to user activity (I, 2021). An example would be on a retail website, by adding a product to your shopping cart, an alert could display on the screen that the product you have selected has been added to your cart. This would allow users to make sure they have chosen the correct product to purchase. Ikea's website, under each product there is a basket image that allows users to add products to the cart. When adding a product to the cart, an alert will display on the screen that tells the user the product is added to the cart. This interaction style allows users to know that the product is added to their cart, and also gives them the option to view their cart. A similar interaction style on the website also allows for users to add products to their favorite list while browsing. A favorites list saves a list of products the user might want to purchase, but not at the current moment.

Homebase does not give users the option to add products to their cart while browsing, but they do allow logged-in users to add products to their Wishlist while browsing. For Homebase, an interaction style would be an alert at the bottom of the screen that allows users to ask for help. By clicking this alert, users will be taken to a page where they can talk to available staff online. This interaction style can be useful because it allows users to have any question answered that they cannot find online or on a frequently asked page. On the website Ikea, there is also an alert at the bottom of the screen if the user needs help. Unlike Homebase's alert which brings the user to a new page, Ikea's alert opens a chat on the same page that allows users to ask any question that they cannot find online. Below is a chart comparing the factors of each website.

	Homebase	Ikea
Search bar included	Yes	yes
Availability of products	shown in symbols	shown in words
Preview of furniture	Shown in setting	Shown in packaging
Add to cart option while in search	No	yes
Wishlist option	Yes	yes
filter during search	top of page	left of page
collapsible filter	Yes	yes
shows similar products	No	yes

Figure 9: Comparison chart between Homebase and Ikea.

Method and Likert Scale.

The type of survey I will be using to see if web design affects user trust is a Likert scale. The Likert scale is a common way to measure surveys (Mcleod, 2023). In a Likert scale, there are usually either five or seven choices that a user can decide on to express their opinions based on a question. These points usually range from strongly agree to strongly disagree or indifferent. Each option is paired with a numerical value. For example, strongly disagree would be a 1, while strongly agree would be a 5 (Mcleod, 2023). Likert scales can measure agreement (agree or disagree), frequency (always or never), importance, likelihood, or quality. My Likert scale would measure answers based on agreement, because it is common for TAM based questions to ask opinions based on agreement (Allen, 2020) .

Because Likert scales have a rank order, mean and standard deviation are not commonly recommended for analyzing Likert scales (St. Andrews, 2014). The reason why the mean cannot be analyzed is because it has no meaning when finding the average of strongly agree and disagree. Instead, with statistics a Likert scale can be summarized

using a median or a mode, and the mode would be the most suitable for easy interpretation. The mode would be an appropriate way to measure the results because it shows the most frequent responses. The median can (St. Andrews, 2014) be used to analyze the results because it shows where the center value is located in a dataset. Another method is to display the distribution of observations in a bar chart.

When identifying the hypothesis that will be used, there should be a dependent variable and at least one independent variable that defines the groups that will be tested. For this thesis, the independent variable is perceived ease of use, and the dependent variable is perceived usefulness. This is because perceived ease of use affects perceived usefulness. Perceived usefulness will also affect the amount of trust someone has when online shopping. When analyzing a Likert scale, the tests that can be used are the Mann Whitney test, the Kruskal Wallis test, or the Chi-square test. The Chi-square test is different from the other tests because it allows for the data to be combined into two nominal categories: agree and disagree (St. Andrews, 2014).

Disadvantages of Likert scale include central tendency bias, which is when people who answer a survey tend to avoid the extreme options. Users will also tend to agree with the statements that are presented to them, which is acquiescence bias. Another disadvantage is social desirability bias, where users attempt to portray themselves in a more favorable light based on the questions presented (LaMarca, 2011).

Tarek Elsharif (2017) uses bar graphs when displaying information collected from Likert scales. For the survey, Elsharif uses bar graphs to show the demographic of the people who took his survey. The author uses data to see whether or not respondents use

excel programs and their years of computer usage, then displays this information in a bar graph, to show which choices have the most and least responses.

Elsharif (2017) also runs two linear regressions to find the coefficients, t-value, p-value, F, p-vales, and R2 values for the data from the perceived use and perceived ease of use questions. For these linear regressions, usage is the dependent variable and perceived usefulness and perceived ease of use are the independent variables. He displays this information with a table. Because the t-values were greater than the p-values, it shows that perceived usefulness has a greater effect on technology usage behavior than perceived ease of use.

Another example from the document "Technology acceptance model in e-commerce segment" uses a bar graph to show the percent of how many people chose each response for each question, along with a table that displays the actual percent for each choice for each question. For example, 3.48 percent of people chose the response definitely disagree, while 40.43 percent of people chose the response definitely agree (Fedorko, Igor & Bacik, Radovan & Gavurová, Beáta. , 2018).

Jacob Jacoby and Michael S. Matell discuss Likert scales as well. The authors state that determining the optimal response categories is especially important when contrasting Likert scale questions. Too few response categories will result in a scale that is too unrefined and will lose much of the user's options. If a scale is too wide, it may also go past the user's limited powers of discrimination. These authors undertook an investigation to determine if there is an optimal number of choices to use in the construction of a Likert scale.

For the method, the subjects chosen were 360 undergraduates at Purdue university who were enrolled in introductory psychology, applied psychology, industrial psychology, and consumer psychology. The first subject received a 2-point rating scale, the second received a 3-point scale, and so on until the next subject received a 19-point scale and repeated until subjects had scales. Responses for each question were divided into two groups so that all number responses were labeled as "agree," and all responses on the left were labeled as "disagree (Jacoby, Jacob, and Michael S. Matell, 1971)."

According to the information gathered from the experiment, increasing the number of choices in a Likert scale does not lead to greater reliability or validity. The same results were obtained from each of the areas of the study. The authors also determined from the results that reliability should not be a factor in determining a Likert-type scale rating format, because it is independent from the number of choices used in a survey (Jacoby, Jacob, and Michael S. Matell, 1971). As with reliability, validity was found to be independent from the number of scale points. The authors conclude that when determining the number of steps in a Likert scale rating format, validity does not need to be considered because there is not a consistent relationship between it and the number of scale steps used.

According to David R. Hodge and David Gillespie, one important factor when constructing questions to be used in a survey is to be as clear and concise as possible. The more items that are considered complex, the more likely respondents will misunderstand the question and provide misleading answers. Even small changes in wording can increase the complexity of a question and dramatically alter response patterns (Hodge, D.

R., and D. Gillespie, 2003). Because of the design, Likert questions ask users to think along at least two different dimensions, which are content and intensity. Users must examine the given statement and decide whether they agree or disagree with the content of the stated proposition. Users must also assess their level of intensity regarding the statement given, which means they must evaluate how strongly they feel about the proposition.

Likert scales questions do not produce one-dimensional responses, which can increase measurement error by increasing the level of cognitive noise. Cognitive noise results when a given statement is too complex, which will cause varying results in a survey (Hodge, D. R., and D. Gillespie, 2003). Likert scales also commonly incorporate the use of negatively worded statements. Negatively worded items are used to reduce the problem of response bias, which is when users are more likely to agree with a series of positively worded statements. However, the use of negatively worded statements increases the level of cognitive complexity.

A similar issue arises when users disagree with positively worded statements. Disagreement is more problematic because respondents may disagree with a statement for any number of reasons. Additional problems occur with the use of an odd number of response categories, for example five-point or three-point scales. These responses use a midpoint response category such as undecided, indifferent, or no opinion. When the midpoint is understood as a "no answer" response, it is common to remove these responses when calculating the score total. However, with five-point Likert scales, many cases see "no answer" responses as attributed to a higher value than disagree or strongly

disagree (Hodge, D. R., and D. Gillespie, 2003). Whenever a five-point Likert scale is used, a considerable degree of error may be incorporated because the midpoint value is always considered a value, regardless of the choice being considered a "no answer" response (Hodge, D. R., and D. Gillespie, 2003).

Increasing the number of units in the response key often increases the amount of information collected, which then increases reliability. One reason why the standard five-point key is so widely used is that researchers believe its response options are consistent with users' actual experiences. Another difficulty with increasing the number of response categories is related to the stated problem with using positive or negative statements. Further dividing the range does little to increase reliability and validity.

Chapter 4

The Survey

For this study, the survey will be a five-point Likert scale. A Likert scale is a type of survey that determines the opinions of users based on their response to a given statement. I chose to do this type of questionnaire because it is a common way to measure surveys. For the range of responses, I chose a 5-point range because too few choices, for example a three-point range Likert Scale, will lead to less variation in answers. The response choices for my survey will range from strongly agree to strongly disagree.

My survey will have 14 questions. The number was chosen after reviewing other similar studies. The questions are ordered into those dealing with perceived usefulness, perceived ease of use, trust, and then attitude. Ease of use and usefulness impact trust and attitude so I evaluated trust and attitude last. The perceived usefulness and perceived ease of use questions are based on the studies of Wang (2003), Luarn (2006), davis (1989), and based on the study of Pei Wen, Liao & Hsieh, Jun-Yi (2010). The questions for trust and attitude are based on the studies of Chen and Lee(2008); Salo and Karlaluoto (2007).

The questions regarding perceived use are:

1. The online system provides useful content.
2. The online system provides sufficient content.
3. The online system makes it easy to find the content required.
4. Using the site can improve my shopping performance.
5. Using the site can increase my shopping effectiveness.

These questions are to determine if the users believe that the websites they are reviewing would be useful to them when shopping for furniture.

The questions regarding perceived ease of use are:

6. Using online shopping would improve the of use speed with which I could conduct.
7. Using online shopping would make it easier for me to conduct transactions.
8. Learning to operate the website would be easy for me.
9. It would be easy for me to become skillful at using the website.
10. I find the site easy to use.

The questions ask the user whether they believe that using these websites will take a lot of effort and they will be able to complete purchases on these websites efficiently and effectively. These questions also ask the users if they think they could learn how to use these websites in a small amount of time.

The questions regarding trust are:

11. The products as shown on the website are reliable.
12. This website is authentic and dependable in its claims.

These questions ask the user if they believe that the website is trustworthy. If the website is reliable, that means the website performs well and the user can trust the website to accomplish their goals. If the website is authentic, that means the user will believe that the products on the website will be genuine and not counterfeit.

The questions regarding attitude are:

13. I think that purchasing on this website is excellent.
14. I think that purchasing on this website is enjoyable.

The purpose of these questions is to see if the website design will have an effect on how the user feels about shopping on the website. This question along with the questions that determine trust will be asked last after the user decides their opinions on the use of the website.

For the study, the survey was created on Microsoft Forms, a website that allows a user to create different types of surveys, including questions with answers formatted as a Likert scale response. Microsoft Forms also allows the user who creates the survey to see the number of responses and the number of answers to each question. Along with the number of answers, next to each pair of questions is a chart that shows the creator all of the answer choices and gives the option to open the responses in Excel as well. Microsoft Forms also tells the creator the average time it takes for someone to finish the survey. When editing the survey to send and collecting responses, the creator can choose who can respond: Anyone; only people in my organization can respond; or people in specific organizations can respond. Microsoft Forms also gives the creators the link to their survey, allowing them to share the survey with anyone who would like to complete it.

Microsoft Forms gives the creator the option to download the results to an Excel spreadsheet. The results sheet can be formatted into a chart, where the creator can choose to sort the survey, for example, by name or answer.

Distribution and Results

For the study, I distributed the survey through NSU's Student Messenger, which is a daily newsletter for students at NSU. Student Messenger emails students every weekday, then the notice in Messenger included a description of the purpose of the

survey, how long it would take to complete the survey, a link to the survey, and my contact information. I also sent the link to the email of students from the Scholars' College of NSU. The last method I used to spread the information of my survey was by printing out a QR code of the survey link and putting it around the building of Scholars' College.

Sixty-seven responses were collected for the survey. Two responses were not complete, so they were not used. To compare both websites, I used the first 30 responses for each website. The average time it took for users to complete the survey was two minutes and 44 seconds. I obtained the data from Microsoft forms by clicking on the link that allows me to open the information in Excel. Because I used the survey to collect the responses for both websites, in excel, I sorted the responses by website title, and then separated the information into two sheets: one that contained the response for Homebase, and the other that contained the response for Ikea.

Questions	**The online system provides useful content.**	**The online system provides sufficient content.**	**The online system makes it easy to find the content required**	**Using the site can improve my shopping performance**
Strongly Agree	9	10	12	10
Agree	18	17	12	8
Neutral	3	3	4	9
Disagree	0	0	2	2
Strongly Disagree	0	0	0	1
total	30	30	30	30
percentage				
Strongly Agree	30%	33%	40%	33%
Agree	60%	57%	40%	27%
Neutral	10%	10%	13%	30%
Disagree	0%	0%	7%	7%
Strongly Disagree	0%	0%	0%	3%
Total	100%	100%	100%	100%

Figure 10: The number and percentage of responses for the website Homebase

To compare the response choices for both websites, I created a graph that showed the number of response choices for each question. After that I counted the number of response choices for each question, I divided the number of responses for each choice by the total number of responses for each question to find the percentage of each answer. Below is the chart used to show the number of responses for each question of perceived use for the Homebase website.

After I found the percentages, I transposed the information so that the questions would be placed on the left side of the chart and converted the information of the percentages into stacked bar charts. The reason why I used stacked bar charts of the website is because it is able to display all response percentages for each question. It is also very easy to compare the end values with each other, which are strongly agree and strongly disagree. This is because in a 100% stacked bar chart the end values have a common baseline in 0% and 100% (Vidya, 2019). Since the stacked bar will be horizontal, it will be easy to compare the values for each question and see the most common choice that is selected in the survey. By comparing both charts, it seems that users strongly agree that Ikea provides useful content and is easy to use, which leads to more people agreeing that Ikea is reliable and excellent. According to Hombase's chart, while people agree that while it is easy to find content on the website, there are more people who disagree that the site is effective and easy to use in comparison to Ikea, which results in a lower trust and attitude in comparison to Ikea. Below are the responses for Homebase and Ikea.

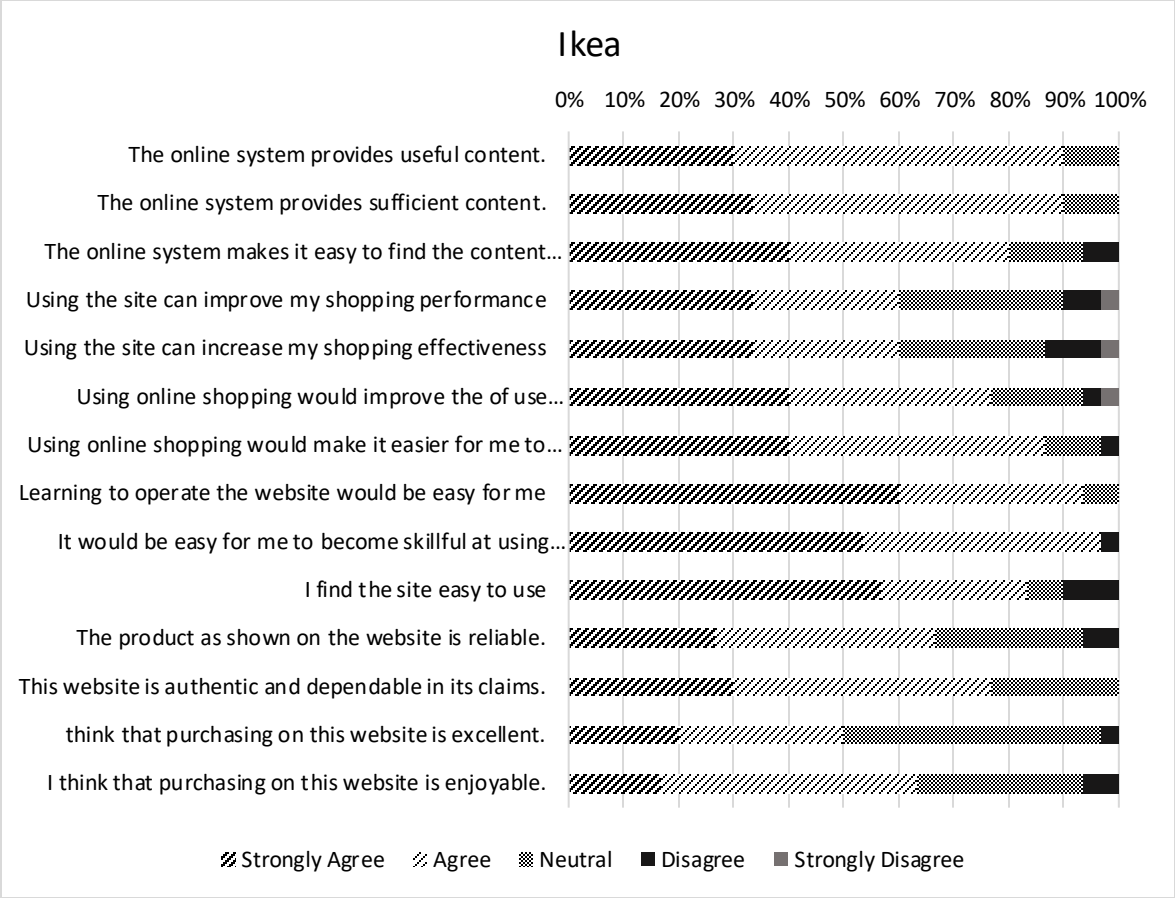

Figure 11: Response choices for Ikea's website design.

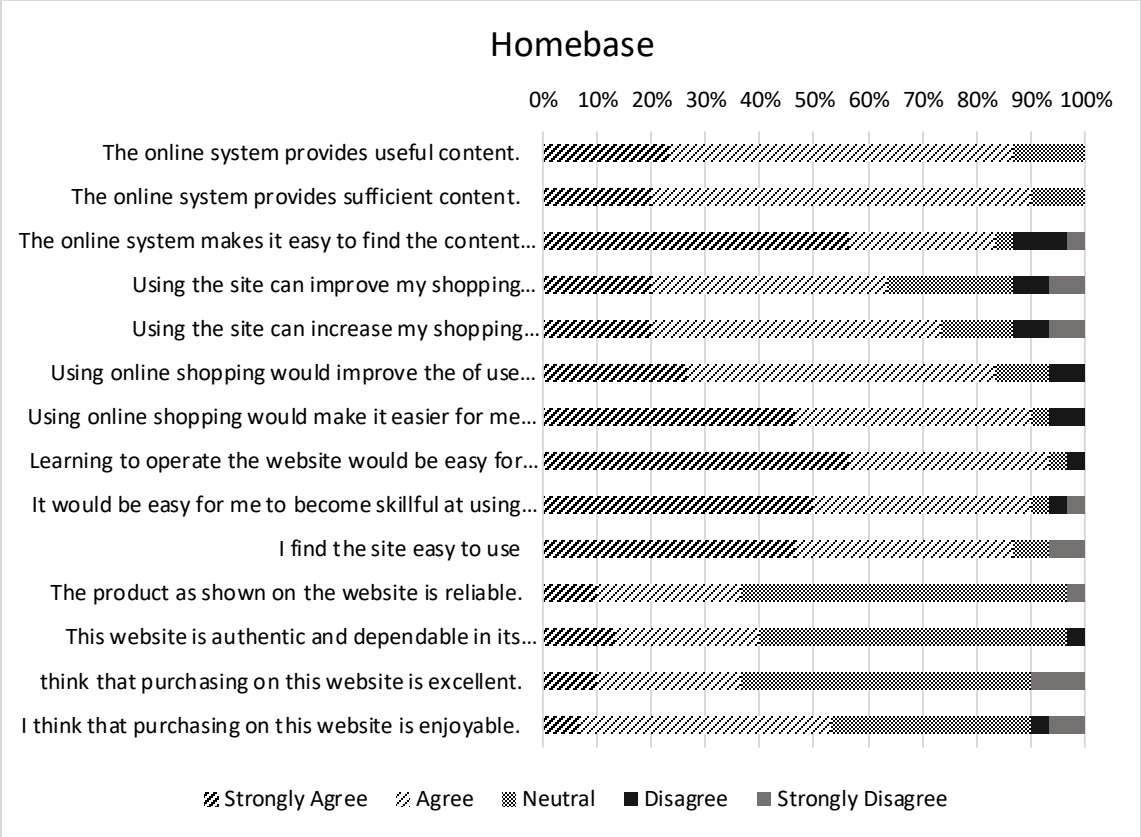

Figure 12: Response choices for Homebase's website design.

Analysis

The first five questions of the survey determine the perceived usefulness of the website. While there were no responses that disagreed with the first two questions, more people agreed that the Ikea website provided useful content, it would be easy to find content required, it can improve shopping performance, and improve shopping effectiveness. Ikea also had fewer users who disagreed on perceived usefulness questions than users that chose Homebase. More people find that using Ikea would improve the performance of shopping compared to Homebase.

The next five questions determined the overall perceived ease of use of the website. While Homebase had more users agree that the website can increase their shopping effectiveness and make shopping easier compared to Ikea, more people agreed that it would be easy to become skilled at using the website Ikea and that Ikea is an easy-to-use website. A similar number of users agreed that learning to operate both websites would be easy. While there were more users who agreed on the perceived ease of use questions for Homebase, there were stronger opinions as well, which can be seen with the greater number of strongly disagrees in the response for Homebase when comparing to the response to Ikea's perceived ease of use. There is not a great difference between users who find that using the website Ikea would be free of effort in comparison to Homebase.

The next two questions determine the user's trust of the website. Following the TAM model, if the user does not find the website to be easy to use and does not think the website will improve shopping performance, the user will have less trust on the website. Most survey respondents (60 percent in question 1 and 57 percent in question 2) felt neutral in the reliability of the products and the dependability of Homebase. There was half the number of neutral responses in the trust of Ikea's products and dependability. Along with the fewer neutral responses, a greater number of users viewed Ikea as authentic and dependable. From these responses, it is clear that more people trusted the Ikea website.

The last two questions determine the attitude the users felt towards the websites. Like trust, attitude is determined by the user's perceived ease of use and perceived usefulness of the website. Even though there was a small increase in the amount of

people who have a positive attitude towards Homebase's website in comparison to the amount of trust, there are less people who have a positive attitude in Homebase than Ikea. There are also more people who have a negative attitude from using Homebase's website than Ikea's website.

I have also used Excel to calculate the chi-square for each question. The chi-square test is used to determine the difference in frequencies from what is expected or not in one or more categories. I used the chi-square test to determine how likely it would be to get the expected responses for each question. Frequency is used to determine the significance of the data. Usually, a significance of 0.05 is used in statistics (Simplilearn, 2023). If the p-value (the frequency) is less than 0.05, the variables have a statistically significant association (Simplilearn, 2023). If the p-value is greater than 0.05, there is not enough evidence to conclude that the variables are associated. P-value is used to determine if the null hypothesis is true or not. The null hypothesis is a hypothesis that claims there is no significant difference between specified populations. For this thesis, the null hypothesis will claim that there is no relationship between website design and user trust and attitude (Simplilearn, 2023).

To calculate the frequency, I combined the total count of agree and strongly agree and combined strongly disagree and disagree so there will be three categories: agree, disagree, and neither. These numbers will be the observed group. To find the number of the expected group, I divided the total number of responses, this means that the expected number of agree and disagree for each question is 15. Each expected count for agree, disagree, and neutral will be 15 responses. After finding the expected and observed

groups, I calculated the frequency with Excel's CHISQ.TEST function. Because the frequency for each question is less than the significance value, 0.05, I can conclude that these variables have a significant association to each other, and it would be more likely that the survey responses would be the responses that were observed instead of being the expected responses. The p-vale being less than 0.05 will also mean that I reject the null hypothesis, and will accept the alternative hypothesis instead, meaning that there is a relationship between the website design and user trust and attitude. Below is the chart of the data being used for the chi-square test.

	The online system provides	The online system	The online system	Using the site can improve	Using the site can increase	Using online shopping	Using online shopping	Learning to operate	It would be easy for me to	I find the site easy to use	The product as shown	This website is	think that purchasi	I think that purchasi
agree	27	27	24	18	18	23	26	28	29	25	20	23	15	19
disagree	0	0	2	3	4	2	1	0	1	3	2	0	1	2
neither	3	3	4	9	8	5	3	2	0	2	8	7	14	9
agree	15	15	15	15	15	15	15	15	15	15	15	15	15	15
disagree	15	15	15	15	15	15	15	15	15	15	15	15	15	15
neither	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7.05517E-07	7.06E-07	4.46E-05	0.001404	0.003241	8.11E-05	4.28E-06	2.97E-07	3.19E-07	5.5E-05	0.000323	1.14E-05	0.000301	0.000445

Figure 13: Chi-square test for the website Ikea

	The online system provides	The online system	The online system	Using the site can improve	Using the site can increase	Using online shopping	Using online shopping	Learning to operate	It would be easy for me to	I find the site easy to use	The product as shown	This website is	think that purchasi	I think that purchasi
neither	4	3	1	7	4	3	1	1	1	2	18	17	16	11
agree	26	27	25	19	22	25	27	28	27	26	11	12	11	16
disagree	0	0	4	4	4	2	2	1	2	2	1	1	3	3
neither	0	0	0	0	0	0	0	0	0	0	0	0	0	0
agree	15	15	15	15	15	15	15	15	15	15	15	15	15	15
disagree	15	15	15	15	15	15	15	15	15	15	15	15	15	15
chi2	1.5648E-06	7.06E-07	0.000124	0.00251	0.000761	2.29E-05	4.92E-06	8.1E-07	4.92E-06	1.1E-05	0.00017	0.000218	0.001091	0.001876

Figure 14: Chi-square test for the website Homebase

Discussion and Conclusion

The Homebase and Ikea websites were chosen to determine if there is a relationship in web design and user trust. To determine the relationship, Homebase is used to determine if there would be a negative response to a website with low quality design, and Ikea was chosen to see if there would be a positive response to a website with good web design. From one website alone it would not be possible to determine if design can cause a decrease in user trust and attitude, so two websites were chosen. After the information from both websites was collected, the number of responses where organized and then put into a chart to compare responses. By comparing the results from the responses from both websites, Ikea can obtain a more trust and a better user attitude in comparison to the responses of trust and attitude for Homebase. To confirm the validity of the response, a chi-square test was used. The chi-square test is used to calculate the frequency, where frequency will show how likely it would be for users to agree and disagree on each question. Because the expected frequency was low for each question, it would be unlikely that respondents would feel neutral about each aspect of the websites. From the frequency given in the test, both surveys showed that there is a relationship between both websites, where more people had more trust for Ikea in comparison to Homebase.

To improve this thesis, more responses should be used. When using a chi-square test, it is important to have the expected number be greater than 10. The number used for this test is greater than 10, but because 15 is not many, there is a greater chance of having errors in the results. The amount of time the survey was available to be taken

was 1 month. To improve this thesis the survey should be available for a longer amount of time, and this will also allow for more people to take the survey.

The thesis also will only be able to compare the relationship of retail base websites that sell housewares. In order to compare different retail websites, another survey might have to be conducted. This survey also only takes into account university students, because the survey was only sent out to students at NSU, so the responses to retail websites might be different for different demographics.

Even though the two websites chosen were both retail websites that sell house products, neither websites did not sell the exact same products, and one website would sell products that the other websites would not have. The difference in products could affect the results of the survey as well. In order to have more accurate results, both websites should sell the same products.

This survey consisted of only broad questions relating to the design of retail-based websites. In order to receive more detailed responses on why a user prefers one website over the other, there should be more questions regarding specific factors of the given website. This way, the website owners will be able to find more ways to approve upon their website's design. The survey could also give respondents open-ended questions that allow for them to give their own input on how to improve the website.

In conclusion, this thesis was able to determine the relationship between website design for retail-based websites and user trust and attitude. By using the Technology Acceptance Model, I was able to create survey questions that asked the user about the factors of each website. When comparing other responses, there was a

difference in user trust and attitude for both websites. Improving upon this study includes increasing the number of participants for the survey, increasing the number of questions, and having a more diverse number of respondents. This study could also be used to determine the user's trust in other websites that do not focus on retail, for example, informational websites.

Appendix A: Survey Questions

Perceived Usefulness Questions (PU)

1. The online system provides useful content. Wang (2003); Wang, Lin, and Luarn (2006)

2. The online system provides sufficient content. Wang (2003); Wang, Lin, and Luarn (2006)

3. The online system makes it easy to find the content required. Wang (2003); Wang, Lin, and Luarn (2006)

4. Using the site can improve my shopping performance. Pei Wen, Liao & Hsieh, Jun-Yi. (2010)

5. Using the site can increase my shopping effectiveness (Based on Davis, 1989)

Perceived Ease of Use Questions (PEU)

1. Using online shopping would improve the of use speed with which I could conduct. Wang (2003); Wang, Lin, and Luarn (2006)

2. Using online shopping would make it easier for me to conduct transactions. Wang (2003); Wang, Lin, and Luarn (2006)

3. Learning to operate the website would be easy for me. (Based on Davis, 1989)

4. It would be easy for me to become skillful at using the website. (Based on Davis, 1989)

5. I find the site easy to use. (Based on Davis, 1989)

Trust

1. The products as shown on the website are reliable. Chen and Lee(2008); Salo and Karjaluoto (2007)

2. This website is authentic and dependable in its claims. Chen and Lee(2008); Salo and Karjaluoto (2007)

Attitude

1. I think that purchasing on this website is excellent. Chen and Lee(2008); Salo and Karjaluoto (2007)

2. I think that purchasing on this website is enjoyable. Chen and Lee(2008); Salo and Karjaluoto (2007)

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