JÖNKÖPING UNIVERSITY
School of Engineering

User interface design in e-commerce and its impact on consumer trust.

MAIN FIELD: *Informatics*
AUTHOR: *Conerlious Z Sagandira and Karl Berg*
SUPERVISOR: *Domina Kiunsi*
JÖNKÖPING February 2020

This final thesis has been carried out at the School of Engineering at Jönköping University within Informatics. The authors are responsible for the presented opinions, conclusions and results.

Examiner:	Bruce Ferwerda
Supervisor:	Domina Kiunsi
Scope:	15 points
Date:	2020-06-09

Postal address:	Visiting address:	Phone:
Box 1026	Gjuterigatan 5	036-10 10 00
551 11 Jönköping		

Abstract

E-commerce is at an all-time high and it is growing larger every year. For e-commerce companies to keep up with the growing market, the question of converting a visitor into a customer becomes increasingly relevant. Since online purchases are stretched over an amount of time and not done in person, trust is an especially crucial factor in these interactions. Current literature shows that navigation and organisation are vital factors when it comes to trust in e-commerce, as such they served as the focus for this thesis.

The study examined how a progress indicator and hierarchy of the purchase process have an impact on trust. This was done by having a group of participants interacting with different prototypes that simulated an e-commerce website, the difference between the prototypes being the inclusion and exclusion of a progress bar and adjustments to the hierarchy of the purchase process. The data was gathered using semi-structured interviews. Data analysis was accomplished using thematic analysis, the result of the analysis being different themes which represent the positive or negative impressions that participants had when interacting with the different prototypes.

The study found that there were multiple differences in themes between the prototypes. The discovered themes suggest that there are multiple ways in which trust differs between the prototypes. Although this study is not strong enough to prove a connection, it does suggest that perhaps companies should think twice before neglecting the organisation and navigation of their purchase process if their interest is to convert more sales.

Keywords

Human-computer interaction, User Interface Design, Trust, E-Commerce

1 Introduction **1**
1.1 Background 1
1.2 Problem statement 3
1.3 Purpose and research questions 3
1.4 Disposition 4

2 Theoretical framework **5**
2.1 E-commerce 5
2.2 Trust 5
2.3 Cues for initial trust 5
2.4 MoTEC 6
2.4.1 Pre-interactional Filters 7
2.4.2 Interface properties 7
2.4.3 How progress indicator and hierarchy of the purchase process have an impact on trust 8
2.4.4 Informational Content 10
2.4.5 Relationship Management 10

3 Method and implementation **12**
3.1 Work process 12
3.2 Approach 13
3.3 Prototypes 14
3.3.1 Progress indicator 14
3.3.2 Purchase process hierarchy 15
3.4 Participant selection 16
3.5 Data collection 16
3.5.1 Interviews 16
3.6 Data analysis 17
3.7 Validity and reliability 18
3.8 Research process 18

4 Empirical data **19**

5 Analysis **23**
5.1 How can a progress indicator have an impact on consumer's trust? 23
5.2 How can the hierarchy of the purchase process have an impact on consumer's trust? 24

6 Discussion and conclusion **26**
6.1 Findings 26
6.2 Implications 26
6.3 Limitations 27

6.4 Conclusions and recommendations 27
6.5 Further research 28

References **29**

Appendices **37**
Appendix A - Prototypes 37

1 Introduction

According to Statista, it is forecasted that global e-retail sales grew 22.8% in 2018 compared to the previous years. The use of e-commerce could lead to economic growth, increased trade efficiency and even promote countries' incorporation into the global economy according to Anvari and Norouzi (2016). E-commerce or electronic commerce is the trading of products or services using computer networks, such as the internet.

Since e-commerce stretches interactions over space and time, and thus requires more trust than traditional shopping, the issue of turning visitors into consumers has become more important. In order to convert visitors to consumers, the visitor needs to know that their money is in safe hands and that their product or service will be provided as promised. Therefore, e-commerce businesses are expected to gain consumer trust.

Working towards the creation of a reliable and trustworthy exchange site is relevant for several reasons. Researchers have studied the concept of trust extensively in many fields, the definition of trust that this thesis works with comes from Stouthuysen et al. (2018): “The willingness of one party to be vulnerable to the actions of another party based on the expectation that the other party will perform a specific act to the truster, irrespective of the other party's ability to monitor or control”. It is vital for e-commerce business owners to look for ways to increase customers’ trust since interested visitors on the site who might become customers will be looking for signs from sellers that can also help increase their trust to purchase a product or service online.

This research aims to find out how the user interface design impacts consumer trust in e-commerce. The problem is examined by having the participants interact with multiple prototypes and then conducting interviews. This thesis has been carried out as a final project work in informatics and a 15-credit course as part of the programme New Media Design.

1.1 Background

BigCommerce predicts that by 2021 there could be as many as 2.14 billion digital purchasers worldwide. E-commerce has become a priority for many businesses as it is seen as a way to overcome certain barriers in the traditional channels of distribution. The rise of Internet-based businesses has radically transformed the global economic and social system (Apăvăloaie, 2014) hence according to this research it is essential to consider trust when building an e-commerce site for both business-to-business (B2B) and business-to-consumer (B2C) transactions.

This thesis explores consumer trust, as it is the major barrier in the adoption of e-commerce (Wang et al., 2018). An essential reality of web and application development is that the user interface is the system for users. These are some of the

reasons why interface design is important when it comes to gaining consumer trust. However although most of the studies contribute to the knowledge about trust, none of them attempted to deduce trust-specific design principles from a thorough theoretical account of trust.

Over the years, the checkout process in online commercial environments has become widely known and shopping on the World Wide Web is now a fairly standard procedure. Based on previous research, it was concluded that consumers preferred using a website with a guided step by step checkout process over the ones without, that includes the progress indicator and hierarchy of the purchase process (Belk et al., 2015).

In this paper progress indicator as an element of navigation and hierarchy of the purchase process as an element of organisation is investigated in depth. This is because these are the main elements of navigation and organisation that affects users in the checkout process, and they have a significant impact on final decision making (Bonastre and Granollers 2014). This shows the significance of using process indicators and hierarchy of the purchase process on an e-commerce website as they bring a sense of direction to consumers hence satisfaction which leads to consumers trusting the website.

Holst (2011) mentions the importance of using progress indicators in navigation and hierarchy of the purchase process in organisation and their significant impact on consumer decision making during the checkout process. However, the impact of these elements on customer trust in e-commerce websites has not been discussed in detail by previous researchers in the field. According to recent e-commerce studies, at least 59,8% of potential customers abandon their shopping cart due to confusion and lack of sense of direction (Baymard Institute, 2014).

When looking at different e-commerce websites there are a couple of differences in how they decide to structure the purchase process. More often than not the use of a progress indicator and the hierarchy of the purchase are different, there does not seem to be a consensus yet. One example of this is between two Swedish e-commerce stores, Bodystore and Apotea.

Bodystore and Apotea are two big e-commerce websites from Sweden. They both focus on selling items such as supplements, whole foods, and other health centred products. When it comes to the e-commerce side of things, there are not a lot of differences between these two companies. They have a lot in common, but one thing they do not have in common is the structure of the payment process. Apotea gives the consumer an overview of the chosen products and then allows the person to fill in their personal details, while Bodystore starts off by asking for personal details and then presents an overview of the products at the end of the purchase process.

Another easily observable difference between some of the biggest e-commerce websites is the use of progress indicators. When making a purchase from Amazon

for example, there is always a visible progress indicator at the top, making sure the user knows where he or she is in the purchase process. Apotea on the other hand does not have the same visual indicator; instead, they give each step of the process a number.

1.2 Problem statement

Previous research has investigated the impact of user interface on trust, but specific elements such as the progress indicator and hierarchy of the purchase process and their impact on trust have not yet been investigated in depth. A survey was conducted by Khialani (2018) where two websites were compared based on their impacts on user impressions and feelings towards websites and their intention to make a purchase. The conclusion of the dissertation is that website design has an influence on trust and that it translates to the user's intention to make a purchase. In his paper "Affective Design of E-Commerce User Interfaces: How to Maximise Perceived Trustworthiness," Egger (2001) gives an overview of the contributing factors that interface properties have on consumer trust.

A thesis by Obioha (2016) titled "User-Centred Design to Engender Trust in E-Commerce" conducted a study to uncover six attributes that contribute to e-commerce trust. The paper provides insight into how these different attributes impact user trust and also to what extent each attribute impacts trust. In addition to this, the paper also discovered that most users focused on aesthetics design, functionality, and security of their privacy and private details.

1.3 Purpose and research questions

The purpose of this thesis is to find out how the progress indicator and purchase process hierarchy can have an impact on consumer trust in e-commerce. These two elements are investigated by having participants go through four different prototypes. There are two prototypes, one with progress indicator and the other one without and two prototypes with varying organisation of the purchase process hierarchy.

The thesis aims to answer two research questions:

1. How can a progress indicator have an impact on consumer's trust?
2. How can the hierarchy of the purchase process have an impact on consumer's trust?

The prototypes are limited to desktop only due to the limited time frame. The thesis does not focus on factors of consumer trust that are cultural. The focus of this dissertation is limited to the interaction between the business and the customer.

1.4 Disposition

The introduction makes the reader aware of the chosen topic, it also talks about the necessary information that the reader needs to know in order to understand the focus of the thesis, this includes the background and research questions which serves as the focal point of this dissertation. Method and Implementation expands on the method and data collection. In other words, it goes into detail of how the interviews are structured, what model will be used and how the data will be analysed.

Theoretical framework aims to explain the prerequisite knowledge that is needed to understand the thesis, various concepts, theories, and philosophies that serve as the basis for the thesis are explained. The findings chapter is, as the name implies, presenting the findings in an easily digestible manner. Analysis goes into detail about what the data actually means. Discussion and conclusion are a general discussion of the thesis and its results, conclusions are drawn based on the results gathered from the research method and empirical data.

2 Theoretical framework

2.1 E-commerce

E-commerce (short for electronic commerce), are online vendors where individuals can purchase and sell various products or services. E-commerce is most commonly known as the technology for electronic communication and digital information processing in business transactions to establish, transform and redefine value-creating relationships between organizations and individuals.

There are five distinct types of e-commerce: business-to-business (B2B), business-to-consumer (B2C), consumer-to-consumer (C2C), business-to-government (B2G) and mobile commerce (m-commerce) (Bhat and Kansana, 2016). B2C refers to organisations or companies selling products or services directly to consumers online. This thesis focuses solely on B2C e-commerce.

2.2 Trust

According to Stouthuysen et al. (2018), “Trust reflects the willingness of a party to be vulnerable to the actions of another party based on positive expectations regarding the other party’s motivation and/or behaviour”.

There are two distinct types of trust: initial trust and trust that comes from direct experience. Initial trust refers to a novel situation in which a customer assesses a merchant's dependability whereas trust based on direct experience presupposes an initial transaction (Stouthuysen et al., 2018), followed by an assessment of the result, as such it influences the long-term nature of the relationship between any involved parties (Egger, 2001).

Initial trust is an important part that any serious online business should try to build with their customers. If a user builds a negative initial trust of a website the chances of a future purchase are very slim (Huang et al. 2017). This thesis focuses on the first type of trust, initial trust.

2.3 Cues for initial trust

According to Han and Kim (2017), customers describe the shopping online as frustrating, confusing, and overwhelming. A good online experience improves customer engagement, helps them spend more time on the retailer's website and ultimately increases online shopping.

Trust, according to Zhang et al. (2019), refers to “the attitude that an agent will help achieve an individual’s goals in a situation characterised by uncertainty and vulnerability”.

Moreover online transactions entail higher levels of uncertainty than transactions in a retail store; a customer needs to have initial trust in order to be able to purchase a product from a specific online website because transactions take place in a virtual environment and before the transaction there is no physical evaluation.

Research demonstrates that trust is a valuable facilitator of many forms of exchange especially in uncertain environments; uncertainty and elevated level of risk are the main characteristics of an online environment (Hammouri and Abu-Shanab, 2017). Thus, an exchange site must provide a strong set of trust signals and is generally regarded as reliant on a specific firm by its stakeholders with respect to the firm's business activities in the electronic medium generally, and specifically on its website (Kim and Peterson, 2017).

2.4 MoTEC

Model of Trust for Electronic Commerce (MoTEC) is a framework developed by Florian N. Egger and Boyd de Groot in 2000 and refined by Egger in 2003. MoTEC identifies key factors that impact consumer trust towards e-commerce (Egger, 2003). MoTEC can be divided into four theories:

- Pre-interactional Filters
- Interface Properties
- Informational Content
- Relationship Management

All the above theories can be used to analyse trust for electronic commerce. In this research, only interface properties were investigated in depth since both research questions one and two are focused on organisation and navigation as components of Interface Properties. The constructs of these components are a progress indicator and hierarchy of the purchase process.

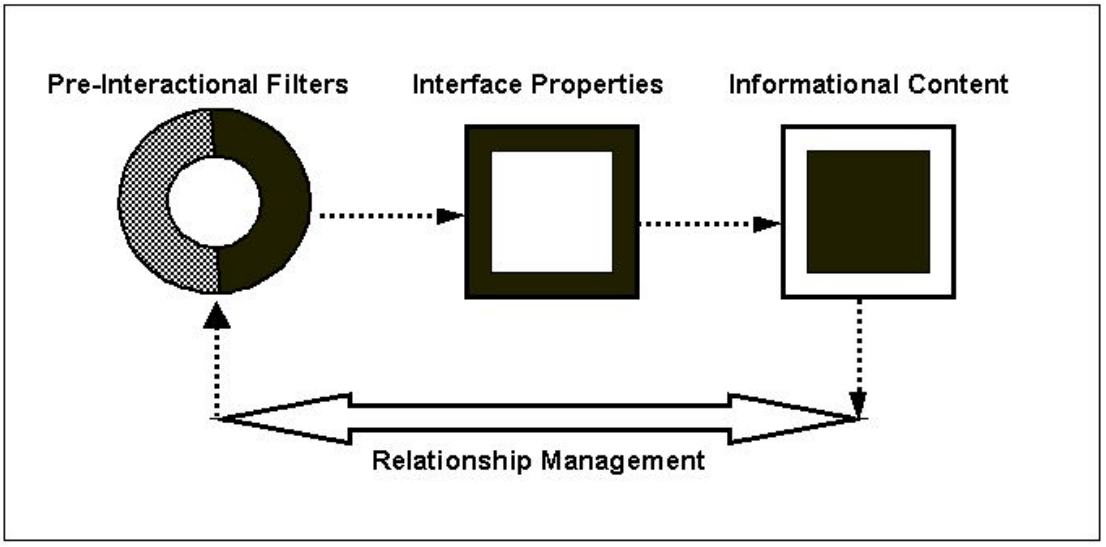

Figure 2.1 Model of Trust for Electronic Commerce (Egger, 2003).

2.4.1 Pre-interactional Filters

The first theory describes two main types of pre-interactional filters: user psychology and pre-purchase knowledge. These are the elements that impact the perception that people have towards an e-commerce system before even interacting with it.

2.4.2 Interface properties

This is the part of the model which serves as the core of this thesis; this is because it is the only theory within MoTEC that is relevant to evaluate the impact of user interface on trust. Interface properties identify two main factors: branding and usability. Branding can be broken down into two subcomponents, usability is divided into four (Egger, 2003).

Table 3 – Interface Properties: Components & sub-components

Dimension 2: Interface Properties	
Branding	Usability
Appeal Professionalism	Organisation Navigation Relevance Reliability

Figure 2.2 Interface Properties (Egger, 2003).

Appeal - This is the impression that the user gets when first visiting a site. Appeal could generally be described as the way in which the site's layout and graphic design influences the user positively. An important part of the appeal is the ability for a business to stand out and seem unique; this could be achieved by using a certain slogan, logo, or mission statement (Egger, 2003).

Professionalism - As the name implies it describes how professional the website looks to the user. Factors that impact this are things such as attention to detail and customer-centeredness. A professional look could imply that the company is financially viable and that they have a reputation to uphold, and a company with a good reputation is less likely to engage in opportunistic behaviour (Egger, 2003).

Organisation - In recent years, there has been an increase in challenges of organizing information. The ability to organize information affects how people perceive the world; information is organized to understand, to explain and to control. The way information is organized, labelled, and related to information influences the way people comprehend that information.

An embedded navigation system is highly considered in this thesis as it focuses mainly on desktop versions. Hierarchy of the purchase process is analysed in depth as one of the key elements in creating an embedded navigation. In general, the purchasing process can be divided into five stages:

The first stage is selecting a product. This entails actually clicking on the product and pressing “buy.” When this has been done the user is redirected to the shopping cart which is the second step. In this step an overview of the selected products are presented, this includes but is not limited to details such as the name and quantity of the selected product. When the user confirms that the selected products are correct, they move on to the third stage. The third stage asks the user for various personal information that is needed to actually ship the product to the correct place.

The fourth step is concerned with the shipping method, delivery method and notification method. The fifth and last step is the payment method. When the user is done with this step the purchasing process has concluded. Overall, a chronological order of the stages is investigated in one prototype against the one created without respecting the order of purchasing stages.

Navigation - From breadcrumbs to campuses and astrolabes, maps, street signs, and global positioning systems, people have shown tremendous creativity in developing and using different strategies to navigate. A progress indicator is used so that consumers will know where they are during the purchase process.

Relevance - How relevant the users feel that the website is to their needs.

Reliability - This is in reference to things such as the speed of the website’s server or reliability of hardware and software that the website relies on.

2.4.3 How progress indicator and hierarchy of the purchase process have an impact on trust

Progress indicator - It is a bad thing to get lost. It is connected to uncertainty, annoyance, anger, and fear. The sensations of frustration of customers usually grow from their unfavourable experience in the shopping environment (Saeed et al., 2018). In previous research, it was proven that web design features affect customers' cognitive and motivational aspects such as satisfaction and trust towards online purchase intentions (Faisal et al., 2018).

However, there are many different web design features that can affect customer trust. Navigation is one of them, the use of navigation in e-commerce leads to higher consumer satisfaction towards a website (Fernandez-Lanvin and Faisal 2018). Trust and satisfaction issues have become a major concern faced by all e-buyers as well as sellers (Ghada and Gunawan, 2018).

Satisfaction is defined as “the emotional decision by consumers in response to their most recent experience with a retailer in terms of product, or service aspects” (Fotis, 2019). Hence consumer satisfaction should be built to gain consumer trust (Faisal et al., 2018).

In this thesis, progress indicators and how they can have an impact on consumer trust are analysed in depth. A progress indicator is a graphical element that shows the user where they are in the current process. This is done to avoid confusion and frustration when consumers are interacting with a website. Once a consumer is confused or frustrated when using a site, chances are very low that they are satisfied (Johansson et al., 2019). This brings to a point of trust as previously mentioned; lack of satisfaction has a significant impact on consumer trust. Overall websites are considered reliable and efficient when well organized and navigated which helps users find information quickly and efficiently (Yanez, 2017), thus increasing consumer trust.

Hierarchy of the purchase process - The way information is structured or organised, marked and linked to other information affects how people interpret the information (Rosenfeld and Morville, 2015). If users interpret information wrongly or if they do not understand the meaning, they try to avoid interaction with that website due to fear of being lost and confused (Haddad et al., 2018). Hence purchase process stages are used to give a sense of direction when users are checking out on a website (Thirumalai and Sinha, 2011). Figure 2.3 shows an example of what the purchase process could look like (Suthar, 2019).

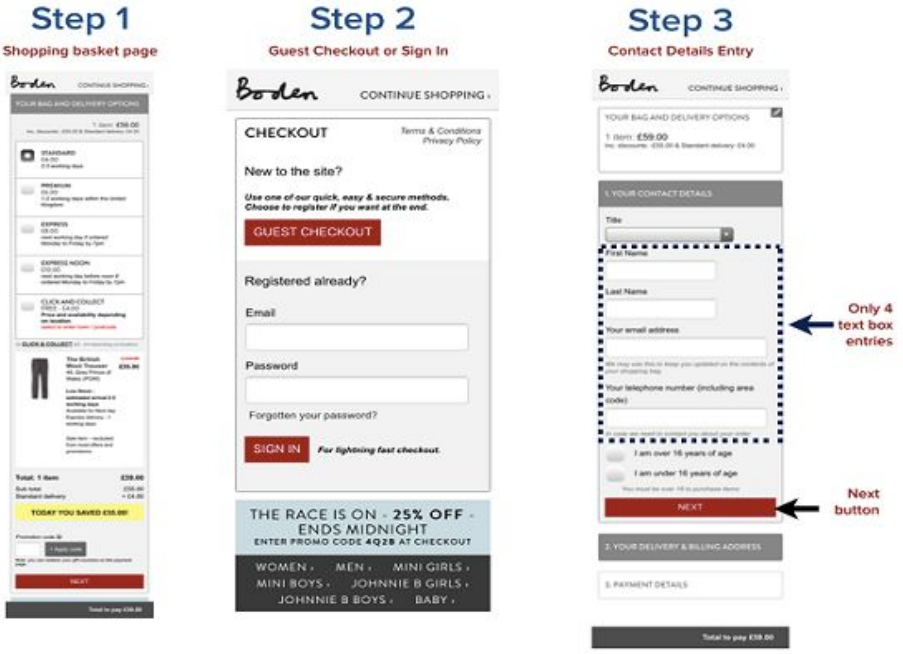

Fig 2.3 An example of stages in the purchase process (Suthar, 2019).

Common stages in this process involve steps like putting a product in a cart, filling out your name and postal and email address, seeing an overview of the chosen items and finally a page featuring bank details. These are all the stages that are expected by consumers during the purchase process (Suthar, 2019).

However, purchase process stages should be organised in a way which is familiar to the consumer's purchase experience (Grabner-Kräuter and Kaluscha 2008). Consumers need to know which stage to start with when they are about to purchase a product online to avoid confusion and increase satisfaction (Huang et al 2017). The user might feel worried if a website requests banking details before they are given a chance to choose a desired product (Haddad and Hage, 2018). On average 30,000 new websites are hacked every day in 2020 according to WebARX, therefore most consumers are aware of the growth of malicious websites that deceive people. Once consumers are worried because of fear of being hacked when interacting with a site online, they are likely not going to be satisfied (Wang et al., 2018).

Wrong arrangement of purchase process stages can be a sign to alarm users or make them become suspicious. Overall if purchase process stages are confusing and instil fear, consumers are more likely to be unsatisfied. Hence online lack of satisfaction results in lack of trust (Gustavsson and Johansson 2018).

2.4.4 Informational Content

Competence - Competence is the assessment of a party's ability to follow up on their word (Egger, 2003). A company's identity can tell the consumer a lot about what expectations they should have on said company's ability to follow up and deliver products or services. Other factors such as values, achievements, costs, and partnerships also contribute to the image of competence (Egger, 2003).

Risk - There are two components to trust according to Egger (2003). First, there is a question of security. Since e-commerce is dealing with sensitive data it is especially important that encryption has been thought out. The basis of every e-commerce is how the payments are processed; it is important that a proper method has been utilised. Secondly it is a question of privacy. Factors such as policy and data registration make up a big part of the risk for e-commerce websites (Egger, 2003).

2.4.5 Relationship Management

Pre-purchase Interactions - These are the interactions that happen before the consumer decides to buy a product or service. The focus here is building trust with the user; this could be accomplished in a couple of ways. Means of contact is important; the customer should be able to contact the company (chat, email or by call). The company's response time is important; it should not take an unreasonable amount of time to get a reply. A few other factors are the quality of help, personal touch and trust development (Egger, 2003).

Post-purchase Interactions - As opposed to pre-purchase interactions, post-purchase interactions are all about maintaining the trust that has been built (Egger, 2003). There are a few ways to maintain trust; one is to make sure the user is aware of the order processing. Order processing involves letting the user know the stages that their product is currently in, giving the customer a sense of control. Fulfilment talks about the customer experience and how it relates to the delivery of a product. After sales comes the contact that the customer has with the company after a purchase has been done, it makes sure that the customer does not feel left out.

E-commerce (short for electronic commerce), are online vendors where individuals can purchase and sell various products or services. There are distinct types of business transactions, this thesis focuses solely on business-to-consumer (B2C) transactions. There are two different types of trust: initial trust and trust that comes from direct experience. This thesis works with initial trust; it refers to a novel situation in which a customer assesses a merchant's dependability without any prior interaction.

This chosen model for trust is MoTEC (Model of Trust for Electronic Commerce). It is a framework developed by Florian N. Egger that identifies key factors that impact consumer trust towards e-commerce. MoTEC can be divided into four theories:

- Pre-interactional Filters
- Interface Properties
- Informational Content
- Relationship Management

Progress indicators are an essential part of a website for it makes consumers pass the required procedures which are necessary to complete the purchase by indicating where to start from, where they are and what they are expected to do. Overall, using a progress indicator on a website can help maximise consumer satisfaction since it is easy to understand how everything on the site is supposed to go and it creates the feeling of being guided.

Organizing purchase process stages in a way that is expected by consumers is also a good practice when designing an e-commerce website. The payment stage is one of the most important stages that can easily alert consumers or make them feel unsafe to use a website. Placing a payment stage just after signing in can produce negative results towards a website since it is not a widespread practice in e-commerce. A payment stage can be placed towards the end of the purchase process and this can give positive results towards the website such as satisfaction.

3 Method and implementation

Trust is a complex and imprecise concept that is vital to e-commerce systems and can be defined in many ways (Beatty et al. 2011). In order to make sure that the chosen definition is valid and that it works in tandem with this study, a model that explores trust is utilised. There are multiple models that do this, but a select few seem to be suitable: “Web Trust Model,” “E2CTM” and “MoTEC”.

In addition to the chosen model, the research questions are answered using an inductive approach, semi-structured interviews and interactive prototypes that aim to illustrate the difference in trust using the selected elements. The chosen qualitative research method was phenomenology; this is because of the chosen research questions. The data is quantitatively analysed using a thematic analysis to arrive at themes that later on is used to draw conclusions.

The “Web Trust Model" was developed by McKnight et al. (2002) which comprises four high-level constructs: disposition to trust, institution-based trust, trusting beliefs and trusting intentions. The Web Trust Model identifies three main constructs of disposition to trust: competence, integrity attributes and benevolence. Although the model focuses on trust, it lacks the specific technical focus that is needed to answer the research questions posed in this thesis.

Another model that centres on trust is called “Enhanced E-commerce Trust Model,” or “E2CTM” for short. In an article by Morid and Shajari (2012), the authors are quoted as saying “Conventional trust models cannot simultaneously fulfil three major requirements of community based centralized e-commerce systems having a large number of members and economic risk”. As such, they decided to create their own model that would be able to fulfil the needs required of them (Morid and Shajari, 2012). The model places great emphasis on the interaction between the different agents and what their interactions mean for trust, less emphasis is placed on the technical aspects that are sorely needed for this thesis.

The third and final model is “MoTEC,” short for “Model of Trust for Electronic Commerce.” Just like the aforementioned models, MoTEC focuses on trust in e-commerce, the difference is that MoTEC also features constructs that can be used to interpret changes in the user interface, and as such it serves as a solid basis for this research. MoTEC was first released in 1998 and was later refined in 2001 (Egger, 2001), despite its old age it is still relevant within the field. His paper “Affective design of e-commerce user interfaces: How to maximise perceived trustworthiness” was cited 13 times in 2019, as such the model should still be able to serve a purpose.

3.1 Work process

Qualitative research was used because the aim of this paper is to gain an understanding of underlying reasons, opinions and motivations of consumers when

interacting with e-commerce websites in connection to trust. By using a qualitative method, trends are uncovered, and this helps to dive deeper into the problem.

Phenomenology is concerned with describing a particular activity, event, or phenomenon. The reason for choosing phenomenology as a qualitative research method is because it, as the name implies, focuses on a particular phenomenon. This is in line with the research question elements since that is just what they are, an interesting difference that can be observed when comparing big e-commerce companies.

The reason for choosing interviews as a way to collect data is that it gives a deeper understanding than most other methods which can be required in order to answer the proposed research questions. Interviews also allow for observations such as emotions in their voice, body language or any other observation that is more easily visible when collecting data in person. The interview questions were based on two constructs gathered from MoTEC, namely organisation and navigation. Interviews served as the main way to collect empirical data for this thesis.

Prototypes were used because they are able to closely imitate the experience of making an actual purchase online since both the interaction and the design mirrors a legit e-commerce website. Prototypes can also be altered to feature or not feature the elements that are used as research questions; this makes it easier to isolate how participants feel about a particular element. Prototyping is also the only method which was found suitable for this research because of its connection to theoretical literature used in this paper.

The first two prototypes focus on a progress indicator, one has it, the other does not. The other two prototypes tackle the purchase process hierarchy, the difference between these two prototypes being the order in which the stages are presented. The interviews are recorded and transcribed in order to make sure that the data is reliable and not subject to flaws of the memory. The data is analysed using one of the most common forms of analysis within qualitative data, thematic analysis.

3.2 Approach

An inductive approach is used to tackle two research questions addressed in this thesis. Inductive approach, also known as inductive reasoning, begins with the findings and hypotheses that are formulated as a result of observations towards the end of the research process. This approach aims at generating meanings from the collected data set to identify patterns and relationships for the construction of a theory. After collecting data from the interviews, theories based on both research questions are drawn. Data is also sampled theoretically.

3.3 Prototypes

Four high fidelity interactive mock-ups were created to serve as the prototypes. The designs were created in Adobe XD and designed for desktop users. The prototypes are similar to Amazon's structure of the purchase process. Amazon's website structure is used because according to two articles from Forbes in 2019, 89% of consumers prefer Amazon over other competitors, and the company is the largest e-commerce company when looking at generated revenue. This research is based on Amazon's website structure of organisation and navigation since more people are familiar with it compared to other e-commerce websites. The website from Amazon has the typical constructs that are being investigated in this thesis. Certain delimitations are made when it comes to the prototypes. Certain parts that are usually required before making a purchase are not included in the prototypes, for example the user is not required to register an account before buying.

3.3.1 Progress indicator

The first two prototypes focus on a progress indicator. One prototype (Fig 3.2) uses a progress indicator to indicate to the user where he or she is in the process, the other prototype (Fig 3.1) does not have this feature. In these two prototypes the user is tasked with going through the process of purchasing a product from the website. After picking a product the user navigates the steps required in order to complete a purchase of said product.

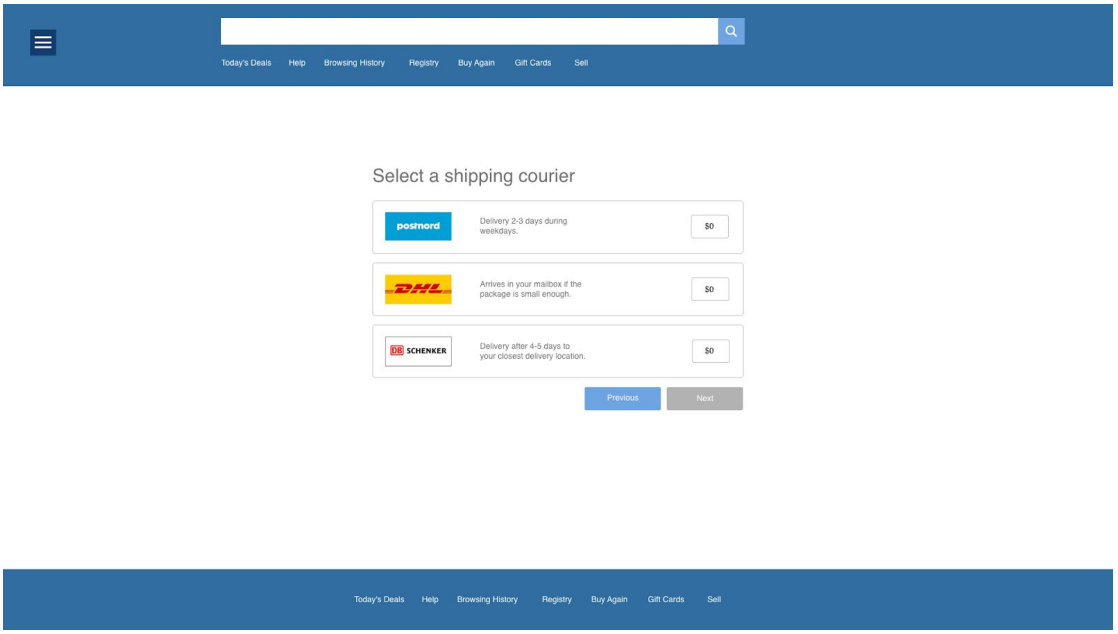

Fig 3.1 Prototype without a progress indicator.

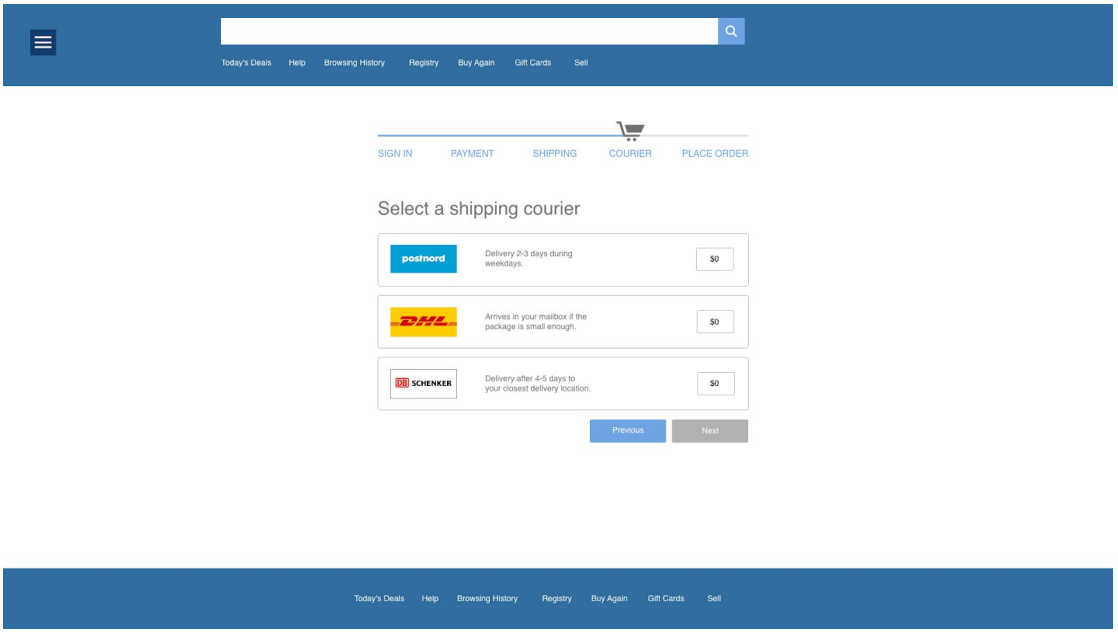

Fig 3.2 Prototype with a progress indicator.

3.3.2 Purchase process hierarchy

The third and fourth prototypes look at the purchase process hierarchy. Much like the previously mentioned prototypes, these also focus on the process of purchasing a product, but the hierarchy of the process is altered instead. In other words, one prototype (Fig 3.3) will feature a purchasing process where the different steps are in accordance with Amazon's stages of the purchase process. The second prototype (Fig 3.4) presents the stages in reverse, meaning that the last step becomes the first step and vice versa. The payment, shipping and courier stage are the only variables that are adjusted in the hierarchy of the purchase process prototype.

Fig 3.3 Hierarchy of the purchase process stages similar to Amazon's website.

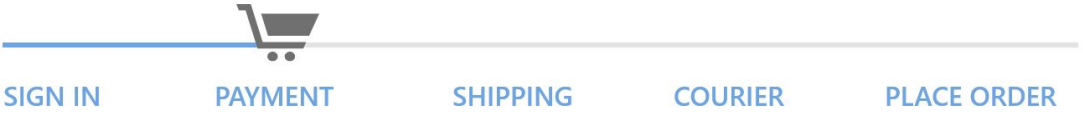

Fig 3.4 Reversed hierarchy of the purchase process stages.

3.4 Participant selection

When it comes to the selection of participants this thesis makes use of convenience sampling. Convenience sampling is a type of non-probability sampling where participants are easily accessible (Etikan, 2016). As the name implies, the strength of convenience sampling is that it is convenient. Participants are easily available, and the sampling is affordable and easy (Etikan, 2016).

3.5 Data collection

MoTEC was used to produce interview questions after participants were asked to complete tasks from the four prototypes. In this thesis, interface properties are used to collect data with the guidance of MoTEC. According to the model there are two different elements presented under interface properties which are: navigation and organisation.

Interview questions were largely generated using the MoTEC model. Since the model highlights interface properties as one of the theories which can be used to measure trust, the theory states that the development of trust is strongly affected by one's first impression of graphic design, how the content is organized in a system and also a system's usability.

Questions for interviews were formulated in the context of usability, organization and finally impression from the graphic design. This paper utilised interview questions relating to organisation, usability and navigation, this made it easy to answer the research questions posed in this paper. The data that was collected from the interviews were used to analyse how a progress indicator and the hierarchy of the purchase process has an impact on trust.

For example, one of the predetermined interview questions was "Which prototype was more easy to use?". This question is directly tied to Egger's (2003) definition of navigation as a subcomponent of interface properties, more specifically Egger states the following: "Generally, ease-of-use could be perceived as a sign that the company understands, cares for and respects its customers".

3.5.1 Interviews

Twelve participants were split in two groups, each group consisted of six participants. This is because it is recommended by Creswell (1998) that the number of participants for interviews should be at least 5 to 25 for phenomenological studies and Morse (1994) suggests at least six participants. The first group completed tasks using the two progress indicator prototypes and the second group using two hierarchy of the purchase process prototypes. After completing the tasks, each participant was interviewed based on their experiences with the two prototypes they used and follow-up questions were asked. Prototypes were used as they make it easy to

articulate and test concepts that respond to the impact of progress indicator and hierarchy of the purchase process on consumers trust.

Participants were interviewed face-to-face about their impressions regarding the prototypes. This thesis makes use of semi-structured interviews which allow for follow-up questions which is another plus, and unlike many other methods interviews do not require too many participants, this is helpful since the availability of participants is limited. Before starting the interviews, participants were encouraged to think aloud, this is to make it easier to notice relevant thought processes and other interesting information that helps in answering the research questions.

While interviews are good, they are not flawless. Conducting the interviews, transcribing the conversations, and then analysing the data can be very time-consuming. The interviews are also prone to bias from the interviewers, certain things might go unnoticed or the interviews might be conducted and transcribed differently based on the person conducting them.

In this thesis, a carryover effect was avoided by using two separate groups during the interviews. In order to make sure that the data is not misleading the two separate groups were matched based on the frequency of how often they shop and their overall experience with e-commerce websites.

The research features participants of different nationalities. In order to make sure that the data is as consistent as possible the interviews were conducted in English only. Participants were allowed to ask questions if they did not understand certain words or concepts in order to avoid any confusion.

3.6 Data analysis

According to Braun and Clarke (2008), thematic analysis focuses on identifying, analysing, and interpreting patterns of meaning within qualitative data. Since the research questions are concerned with getting an understanding of people's opinion, thematic analysis is able to match that criterion. Nowell et al. (2017) also talks about the freedom and flexibility that comes from thematic analysis. It is a highly adaptable analysis method that is easily modified to fit the needs of the researcher, yet it provides a rich and detailed account of data. As such it was deemed a worthy choice for this type of research.

The thematic analysis is structured using the six different stages that are detailed in an article by Nowell et al., (2017). A qualitative analysis is used and MoTEC is also used to build and structure interview questions to be able to produce results that give meaning, experience, and views. Phenomenology is a research design that is used in this paper.

3.7 Validity and reliability

Validity is defined as the ability to measure the correct thing. The method, processes and designs should all be appropriate in answering the chosen research questions (Leung, 2015). The main theory that is utilised comes from MoTEC, the reliability and validity of this model has been proven to work repeatedly. Since its inception it has been cited 330 times, as such it should still be relevant.

Certain keywords are also explained to the participants in order to make sure that the interviewer and interviewee are on the same page when it comes to definitions of words. Reliability relates to if the data collection can be repeated and still deliver the same results (Leung, 2015). The interviews were recorded and transcribed in order to improve reliability by not exposing the data to the flaws of human memory.

3.8 Research process

The process of finding research papers to base the work on comes from multiple sources: Google Scholar, Stellenbosch University (SUNscholar), Pretoria University (UPSpace), University of Texas (USTA), and Jönköping University's DiVa. The aforementioned platforms enable the exploration of a vast number of dissertations and theses, as such they served as a good starting point for finding the most relevant research that is currently available in the field. The difference between the platforms is the number of dissertations they all contain, some are more limited when it comes to the number of papers, hence relying on multiple platforms is necessary.

The theme of the thesis can be captured using a couple of keywords: human-computer interaction, trust, e-commerce, and user interface design. These keywords were used in different combinations as search queries in the previously mentioned search engines. The search results were ranked by relevance and number of citations, theses that matched the criteria were examined more closely and many served as references for this thesis.

4 Empirical data

After performing the 12 separate interviews the conversations were transcribed. In accordance with a thematic analysis approach, the transcripts were examined in detail and then transformed into a collection of interview extracts. The extracts were then turned into different ‘codes,’ these can be seen in tables **4.1**, **4.2**, **4.3** and **4.4**. A code attempts to capture the essence of each interview extract and express it in a broader way so that it makes sense in not just the original context.

Participant No	Interview extract	Code
Participant 1	**Did not notice a difference**	
Participant 2	- It was nice that you could follow the process - Felt safer for me as a consumer. - I know that I can go back through the process - You know that you can go backwards	- Need for guidance - Feeling of security - In need of control
Participant 3	- Showed you where you are - You could see the next stage - Check the stages are have done - Feels simple to use - Showed the stages I have to complete - I know that I have to complete a, b, c stages. - A very good feeling - It gives a little bit more information about where I am and what I am supposed to do, - I feel like I am more guided - Satisfied more when I use the one, I am guided.	- Need for guidance - Direction - Usable - Should be understandable - Need for transparency - Informative - In need of control - Should be satisfied
Participant 4	- Easy and fast - Able to see the process what is next - Sense of clarity - Feel good - Easy to rely on	- Should be understandable - Need for guidance - Need for transparency - Need something to rely on which is trustable
Participant 5	- Showed the stages I have to complete - Clear and easy to understand - Fast and understandable	- Need for guidance - Should be understandable
Participant 6	- I didn't trust the second one [the one with progress indicator], maybe… as much	- Uncertainty

Fig 4.1 A table showing the codes and interview extracts when a progress indicator was used.

Participant No	Interview extract	Code
Participant 1	**Did not notice a difference**	
Participant 2	- Simple or ‘cheap’	- Avoid anything suspicious
Participant 3		
Participant 4	- Confused and unsure - You don't see what is next	- Should be understandable - Easy to use - Need for guidance
Participant 5	- I don’t like surprises - I don't even see what I will do next. - Extra worried about being scammed.	- Need for guidance - Security -
Participant 6		

Fig 4.2 A table showing the codes and interview extracts when a progress indicator was not used.

	Interview extract	Code
Participant 1	- Used to - Feels normal - Expect	- Feels familiar
Participant 2	- Without raising any questions - Assurance	- Easy to understand - Feel validated
Participant 3	- Well structured	- Good structure
Participant 4	- Seems more legit - Clunky	- Looks legitimate - Hard to use
Participant 5	**Did not notice a difference**	
Participant 6		

Fig 4.3 A table showing the codes and interview extracts when the payment was the last purchase stage.

	Interview extract	Code
Participant 1	- Weird and frightening	- Scared because of unfamiliarity
Participant 2	- More scams nowadays - Worried if a website asks me for my payment details	- Increasingly aware of scams - Sceptic of purchase process hierarchy
Participant 3	- I would never do that, because of scams - Well organised - I try to avoid - There is high risk	- Afraid of being scammed - Good organisation - Risk avoidance
Participant 4	- Someone trying to scam you doesn't need your address - Felt slightly more comfortable	- Sceptic of purchase process hierarchy - Felt comfortable
Participant 5	**Did not notice a difference**	
Participant 6	- It felt better to fix the payment first	- A certain order felt better.

Fig 4.4 A table showing the codes and interview extracts when the payment was the first purchase stage.

5 Analysis

The collected data is analysed using a thematic method where patterns from the code were identified and then transformed into themes that were used to answer the research questions. The generated themes can be seen in figure **5.1**, **5.2**, **5.3** and **5.4**. The data is analysed to help answer the proposed research questions. Each theme is defined with regards to the context of the collected data.

5.1 How can a progress indicator have an impact on consumer's trust?

The existence of a progress indicator on a website had an impact towards how users understand the steps they are expected to complete. On the other hand, according to this research, a website without a progress indicator can give a negative impact on consumer's understandability. If the progress indicator is not used, customers might be confused, frustrated, and even get angry.

In addition to this, using a progress indicator on a website has an impact on the consumer's feeling of being guided. Users need to be guided when they are interacting with a website, they need to know where and what they are expected to do. Consumers also feel safer when using a website with a progress indicator and they tend to get satisfied when using a website with a progress indicator.

Theme	Code
Guided – Refers to the ability of a progress indicator helping a user to walk through the website	- Need for guidance - Direction
Understandability – The amount of effort that is required to understand and go through the purchase process	- Should be understandable - Usable - Easy to use
Security – This is the website's ability to make the user feel free from danger or threat during the purchase process	- Need something to rely on… trustable - Feeling of security
Satisfaction – This refers to the user's fulfilment of wishes, expectations, or needs when purchasing a product online	- Should be satisfied - Avoid anything suspicious - Need something to rely on which is trustable

Fig 5.1 A table showing the positive themes for the progress indicator.

Theme	Code
Guided – Refers to the ability of a progress indicator helping a user to walk through the website	- I don't even see what I will do next. - you don’t see what is next
Feelings – The emotions that the user experiences in the process.	- I don’t like surprises - extra worried about being scammed.
Understandability – The amount of effort that is required to understand and go through the purchase process	- Simple or ‘cheap’ - Confused and unsure

Fig 5.2 A table showing the negative themes from the progress indicator.

5.2 How can the hierarchy of the purchase process have an impact on consumer’s trust?

The hierarchy of the purchase process with the payment last was deemed more trustworthy by participants because of the familiarity of the stages. Participants felt that it was easier to understand the purchase process and the different stages were easier. Satisfaction was higher as it felt more validating and comfortable to go through the process. Participants also expressed that the hierarchy of the purchase process impacted how secure they felt the site was.

When the hierarchy of the purchase process was altered to have the payment stage first certain negative themes could be identified. Participants felt the entire process felt unfamiliar compared to what they were used to. It was also harder to use and felt less secure overall.

Theme	Code
Familiarity – Refers to elements and designs that the user has come to expect from e-commerce websites.	- Feels familiar
Understandability – The amount of effort that is required to understand and go through the purchase process.	- Easy to understand - Good structure - Good organisation
Satisfaction – This refers to the user’s fulfilment of wishes, expectations, or needs when purchasing a product online.	- Feel validated - Felt comfortable - A certain order felt better.
Security – This is the website’s ability to	- Looks legitimate

make the user feel free from danger or threat during the purchase process.	- Assurance

Fig 5.3 A table showing the positive themes from the organisation prototypes.

Theme	Code
Familiarity – Refers to elements and designs that the user has come to expect from e-commerce websites.	- Scared because of unfamiliarity
Usability – The perceived difficulty to use the website.	- Hard to use
Security – This is the website's ability to make the user feel free from danger or threat during the purchase process.	- Increasingly aware of scams - Sceptic of purchase process hierarchy - Afraid of being scammed - Risk avoidance

Fig 5.4 A table showing the negative themes from the organisation prototypes.

6 Discussion and conclusion

6.1 Findings

After conducting research to investigate how the progress indicator and hierarchy of the purchase process have an impact on consumer trust, codes were found and themes were formulated. Interview extracts came from two groups: one from progress indicator prototypes and the other one from hierarchy of the purchase process prototypes.

From extracts about the progress indicator, one out of the six participants did not notice a difference between the prototypes. The other five were able to give feedback and more codes about the progress indicator were found, five themes were later formulated by using these codes. According to the collected data, it was found that progress indicator had more extracts than hierarchy of the purchase process hence more codes emerged from progress indicator investigation compared to hierarchy of the purchase process.

Extracts about hierarchy of the purchase process emerged and the same was true here, only one of the six participants did not notice any difference between the two prototypes. Finally, codes about hierarchy of the purchase process were also created and five themes were formulated. In conclusion, patterns were drawn from concepts and insights about progress indicator and hierarchy of the purchase process, ten themes were then formulated.

6.2 Implications

This study has a few implications for business initiating or those who are currently conducting business-to-consumer electronic commerce. Since online shopping lacks face to face contact, only online retailers which develop websites that meet consumer needs will survive and prosper. It is worth mentioning that the constructs presented in this paper partly overlap with findings made by Obioha (2016) and Khialani (2018). The novelty or uniqueness of this thesis lies in the scope of the knowledge it produces.

This paper contributes by giving more information and insight about two interface properties that can be easily ignored but have an impact on consumer trust in e-commerce and how it can be affected. It can help e-commerce businesses remain competitive since user interface needs to evolve as customer behaviours and technologies change.
Making use of navigation (progress indicator) which is easy to use and properly organised purchase stages (hierarchy of the purchase process) will improve customers' satisfaction hence trust and profit realisation. This paper helps to raise awareness to e-commerce business owners to realise how a progress indicator and

hierarchy of the purchase process can have an impact on their consumer's trust. As mentioned by (Ebert et al. 2009), trust is a key to loyalty which can help yield more profit in business-to-consumer exchanges.

6.3 Limitations

Convenience sampling was used in this research; this was partly because of the limited resources and participants that were available at the time. If given better conditions, other sampling methods might have been a better fit for what this research was trying to achieve. Despite this, the conclusion of this research should still be valuable for how the general population would perceive these changes in the user interface.

While investigating the hierarchy of the purchase process there was a noticeable impact depending on where the payment stage was placed. This is something that could be researched further but it was deemed too time consuming to continue investigating in this paper.

Another factor that influenced the work was Covid-19. Although it did not play a huge role, it limited the communication in multiple ways during the work. Not only between the two authors but also the authors and the supervisor as physical meetings were off the table after the halfway point of the course.

6.4 Conclusions and recommendations

This thesis is aimed to investigate how progress indicator and hierarchy of the purchase process as elements of interface properties have an impact on e-commerce consumer's trust. The study shows that there is a difference in how users interact with both the progress bar and the altered purchase process hierarchy. The results from the thematic method used indicate that progress indicator and hierarchy of the purchase process affects consumer's understandability, feeling of being guided, security, familiarity, usability, and satisfaction. These are the factors that can contribute to consumer's trust towards an e-commerce website.

However, when it comes to the hierarchy of the purchase process, according to the research conducted in this paper there is only a noticeable impact when the payment stage is changed. Consumers were likely to feel safer and more satisfied when they used a prototype with a payment stage towards the end of the purchase process than the one with the payment stage just after signing in.

Overall, by analysing the aforementioned factors it is concluded that progress indicator and hierarchy of the purchase process have an impact on consumer's trust by affecting their feeling of being guided, their sense of security, ease of use, understandability and familiarity. Consumers need to be satisfied when using a website. Previously mentioned factors that contribute to satisfaction must be

considered to be able to increase trust since according to Wang et al. (2018), there is a strong connection between consumer's satisfaction and e-commerce trust. Any e-commerce company that is interested in maximizing their own profits by converting more visitors into customers should take this into consideration.

6.5 Further research

This thesis attempts to identify the different factors that impact consumers in the purchase process when certain elements are altered and how they can really affect consumer's trust, this means that there is plenty of research that could push this topic further. One venue to explore is the question of efficacy when it comes to the elements ability to induce trust. It is still unclear to what degree each element contributes to this; as such it is something that could be explored further.

Another area to explore further could be how to optimally induce trust in the purchase process using these elements. This study only examined two different approaches when it comes to the navigation and organisation of the purchase process, although certain themes were identified that could be used as hints, there is not enough information to inform the creation of an optimal purchase process in regards to trust.

References

Shaver, W. (2013) Effects of Remediation on High-Stakes Standardized Testing. PhD. Yeshiva University.

Egger, F.N. (2001) Affective Design of E-Commerce User Interfaces 2001 report: How to Maximise Perceived Trustworthiness. Proc. Intl. Conf. Affective Human Factors Design, [Online] Volume (), p. 317-324. Available at: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.29.2787&rep=rep1&type=pdf [Accessed: 6 February 2020].

Egger, F.N. (2000) 'Trust Me, I'm an Online Vendor', Extended Abstracts on Human Factors in Computing Systems, 2(), pp. 101-102 [Online]. Available at: https://dl.acm.org/citation.cfm?id=633352 [Accessed: 13 February 2020].

Panula, P. (2017) Building trust in e-commerce, Seinäjoki University of Applied Sciences: SeAMK.

Hidayat, A., Saifullah, M. and Ishak, A. (2016) 'Determinants of Satisfaction, Trust, and Loyalty of Indonesian E-Commerce Customer', International Journal of Economics and Management, 10(S1), pp. 151-166 [Online]. Available at: http://www.ijem.upm.edu.my/vol10noS/11)-VOL_10(S)2016_Anas%20Hidayat(Determinants%20of%20Satisfaction...)Pages%20151-166.pdf [Accessed: 6 February 2020].

Egger, F.N. (2003) From Interactions to Transactions: Designing the Trust Experience for Business-to-Consumer Electronic Commerce, Technische Universiteit Eindhoven: Eindhoven University of Technology.

Oliveira, T., Alhinho, M., Rita, P. and Dhillon, G. (2017) 'Modelling and testing consumer trust dimensions in e-commerce', Computers in Human Behaviour, 71(), pp. 153-164 [Online]. Available at: https://www.sciencedirect.com/science/article/pii/S074756321730064X?via%3Dihub [Accessed: 6 February 2020].

Egger, F.N. and De Groot, B. 2000, Developing a model of trust for electronic commerce: an application to a permissive marketing web site. in Poster proceedings of the 9th international world wide web conference, Amsterdam, The Netherlands, May 15-19, 2000. Foretec Seminars Inc., Reston, VA, pp. 92-93.

Morid, M. and Shajari, M. (2012) 'An enhanced e-commerce trust model for community based centralized systems', Electronic Commerce Research, 12(4), pp. 409-427 [Online]. Available at: https://link.springer.com/article/10.1007/s10660-012-9099-3 [Accessed: 6 February 2020].

Yu, C. and Jiang-yu, L. (2016) 'Building online trust in retailing industry in china', online trust, 3(978-1-60595-368-7), pp. 1-5 [Online]. Available at: https://pdfs.semanticscholar.org/8508/7b3ea90ef9d696c8ea88393308caac7bbf5b.pdf [Accessed: 13 February 2020].

Khialani, D. (2018) The Influence of Website Design on Online Trust in Electronic Commerce Retailing Environments, Nova Southeastern University: NSUWorks.

Obioha, C.L. (2016) User-Centred Design to Engender Trust in E-Commerce, Cape Town: Cape Peninsula University of Technology.

Stouthuysen, K., Teunis, I., Reusen, E. and Slabbinck, H. (2018) 'Initial trust and intentions to buy: The effect of vendor-specific guarantees, customer reviews and the role of online shopping experience', Electronic Commerce Research and Applications, 27(), pp. 23-38 [Online]. Available at: https://www.sciencedirect.com/science/article/pii/S1567422317300911#! [Accessed: 13 February 2020].

Apăvăloaie, E. (2014) 'The Impact of the Internet on the Business Environment', Procedia Economics and Finance, 15(), pp. 951-958 [Online]. Available at: https://core.ac.uk/download/pdf/82790345.pdf [Accessed: 13 February 2020].

Zhang, T., Tao, D., Qu, X., Zhang, X., Lin, R. and Zhang, W. (2019) 'The roles of initial trust and perceived risk in public's acceptance of automated vehicles', Transportation Research Part C: Emerging Technologies, 98(), pp. 207-220 [Online]. Available at: https://www.sciencedirect.com/science/article/pii/S0968090X18308398#! [Accessed: 12 February 2020].

Bhat, S.A. and Kansana, K. (2016), 'A Review Paper on E-Commerce', TIMS 2016-International Conference, Gwalior, India, February.

Kim, Y. and Peterson, R.A. (2017) 'A Meta-analysis of Online Trust Relationships in E-commerce', Journal of Interactive Marketing, 38(), pp. 44-54 [Online]. Available at: https://www.sciencedirect.com/science/article/pii/S1094996817300014#! [Accessed: 12 February 2020].

Hammouri, Q. and Abu-Shanab, E.A. (2017), 'The antecedents of trust in social commerce (Review)', 2017 8th International Conference on Information Technology (ICIT), Amman, Jordan, 17-18 May.

Faisal, C.M.N., Andrés, J., Gonzalez-Rodriguez, M., Lanvin, D.F., Ahmad, M. and Habib, M.A. (2018), 'Impact of Web Design Features on Irritation for E-commerce Websites', The 33rd Annual ACM Symposium on Applied Computing, At Pau, France, April.

Nisar, T.M. and Prabhakar, G. (2017) 'What factors determine e-satisfaction and consumer spending in e-commerce retailing?', Journal of Retailing and Consumer Services, 39(), pp. 135-144 [Online]. Available at: https://www.sciencedirect.com/science/article/pii/S0969698917302680#! [Accessed: 12 February 2020].

DeLuca, L.S., Pickover, C.A., Price, D.L. and Quirk, A.J. 2019, Progress bar updated based on crowd sourced statistics, 20190235717A1.

Huang, G. Chang, C. and Korfiatis, N. (2017) 'Mobile shopping cart abandonment: The roles of conflicts, ambivalence, and hesitation', Business Research, 85(12.008), pp. https://www.sciencedirect.cdom/science/article/abs/pii/S0148296317305027 [Online]. Available at: Science Direct [Accessed: 13 February 2020].

Ning, S. and Min, Z. (2018) 'User Intent, Behaviour, and Perceived Satisfaction in Product Search', User's intention, 55(555), pp. 547.

Wang, D. Bi, G. Zha, Y. and Chen, Y. (2018) 'Sample and Measurement Characteristics as Moderators', A Meta-analysis of Satisfaction-Loyalty Relationship in E-Commerce, 630(941942), pp. https://link.springer.com/article/10.1007/s11277-018-5488-9 [Online]. Available at: Super link [Accessed: 13 February 2020].

Suthar, S. (2019) 8 Steps for Optimizing Your Ecommerce Shopping Cart Checkout in 2020, Available at: https://acquire.io/blog/create-perfect-shopping-cart-checkout/ [Accessed: 13 February 2020].

Chang, M.K., Cheung, W. and Tang, M. (2019) 'Build trust online: Interactions among trust building mechanisms', Interactions among trust building mechanisms, 50(7), pp. 439-445 [Online]. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0378720613000700 [Accessed: 13 February 2020].

Thirumalai, S. and Sinha, K. (2011) 'Customization of the online purchase process in electronic retailing and customer satisfaction: An online field study', operations management, 50(5), pp. 477-488 [Online]. Available at: https://www.sciencedirect.com/science/article/abs/pii/S027269631000094X [Accessed: 13 February 2020].

Gensler, S. and Verhoef, P (2012) 'Understanding consumers' multichannel choices across the different stages of the buying process', operations management, (23), pp. 987-1003 [Online]. Available at: https://www.researchgate.net/publication/257619274_Understanding_consumers'_multichannel_choices_across_the_different_stages_of_the_buying_process [Accessed: 13 February 2020].

Leung, L. (2015) 'Validity, reliability, and generalizability in qualitative research', Journal of Family Medicine and Primary Care, 4(3), pp. 324–327 [Online]. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4535087/ [Accessed: 23 February 2020].

Bonastre, L. and Granollers, T. (2014) 'A Set of Heuristics for User Experience Evaluation in E-commerce Websites', The Seventh International Conference on Advances in Computer-Human Interactions, 2(ACHI), pp. 1-8.

Holst, C. “Fundamental guidelines of e-commerce checkout design,” in Smashing Magazine, April 6, 2011 Available at URL: https://www.smashingmagazine.com/2011/04/fundamental-guidelines-of-e-commerce-checkout-design/ [Retrieved: 23 February 2020].

Belk, M., Germanakos, P. Constantinides, A. and Samaras, G. (2015) 'A Human Cognitive Processing Perspective in Designing E-Commerce Checkout Processes', Human-Computer Interaction, 9296(), pp. 523-530 [Online]. Available at URL: https://link.springer.com/chapter/10.1007/978-3-319-22701-6_38 [Accessed: 26 February 2020].

Anvari, R.D. and Norouzi, D. (2016) 'The Impact of E-commerce and R&D on Economic Development in Some Selected Countries', Procedia - Social and Behavioral Sciences, 299(), pp. 354-362 [Online]. Available at URL: https://www.sciencedirect.com/science/article/pii/S1877042816310813 [Accessed: 26 February 2020].

McKnight, D.H., Choudhury, V. and Kacmar, C. (2002) 'The impact of initial consumer trust on intentions to transact with a web site: a trust building model', Journal of Strategic Information Systems, 11(), pp. 297–323 [Online]. Available at: https://msu.edu/~mcknig26/TrBldgModel.pdf [Accessed: 26 February 2020].

McCole, P. Ramsey, E. and Williams, J. (2010) 'Trust considerations on attitudes towards online purchasing: The moderating effect of privacy and security concerns', Journal of Business Research, 63(9-10), pp. 1018-1024 [Online]. Available at: https://www.sciencedirect.com/science/article/pii/S0148296309001933 [Accessed: 26 February 2020].

Shia, B. Chen, M. Ramdansyah and A. Wang, S (2015) 'E-commerce adoption', Comparison of Decision Making in Adopting E-Commerce between Indonesia and Chinese Taipei (Case Study in Jakarta and Taipei City), 15(), pp. 1-299 [Online]. Available at: https://www.scirp.org/html/3-2120666_61963.htm [Accessed: 26 February 2020].

Baymard Institute, “18 Cart abandonment rate statistics” [Retrieved: January 2014]. Available at URL: https://baymard.com/lists/cart-abandonment-rate [Accessed: 26 February 2020].

Chanana, N. and Goele, S. “Future of e-commerce in India,” International Journal of Computing & Business Research, ISSN (Online): 2229-6166.

Chang, H (2013) 'Examining the mediating effect of positive moods on trust repair in e-commerce', Mediating effect of positive moods, 23(), pp. 355-371.

Han, M.C. and Kim, Y. (2017) 'Why Consumers Hesitate to Shop Online: Perceived Risk and Product Involvement on Taobao.com', promotion management, 23(), pp. 24-44 [Online]. Available at: https://www.tandfonline.com/doi/full/10.1080/10496491.2016.1251530 [Accessed: 26 February 2020].

Hammouri, Q. and Abu-Shanab, E. (2017) 'The Antecedents of Trust in Social Commerce (Review)', Trust in e-commerce, 8(), pp. 1-7 [Online]. Available at: https://www.researchgate.net/publication/317180619_The_Antecedents_of_Trust_in_Social_Commerce_Review [Accessed: 26 February 2020].

Kim, Y. and Peterson, R.A. (2017) 'A Meta-analysis of Online Trust Relationships in E-commerce', Trust in e-commerce, 24(), pp. 1-7 [Online]. Available at: https://www.researchgate.net/publication/316146049_A_Meta-analysis_of_Online_Trust_Relationships_in_E-commerce [Accessed: 26 February 2020].

Mohammed, Saeed. Ahmad, A. and Nahed, A. (2018) 'Adoption of E-Commerce by SMEs and Its Impact on Customer Satisfaction', E-commerce adoption, 1(), pp. 1-33 [Online]. Available at: https://www.researchgate.net/publication/323512473_Adoption_of_E-Commerce_by_SMEs_and_Its_Impact_on_Customer_Satisfaction [Accessed: 26 February 2020].

Javier, A. Martin, G. and Nadeem, F. (2018) 'Impact of Web Design Features on Irritation for E-commerce Websites', Web design features, 1(), pp. 1-8.

C. M. Nadeem Faisal, Martin Gonzalez-Rodriguez, Daniel Fernandez-Lanvin, and Javier de Andres-Suarez (2018) 'Web Design Attributes in Building User Trust, Satisfaction, and Loyalty for a High Uncertainty Avoidance Culture', TRANSACTIONS ON HUMAN-MACHINE SYSTEMS, 7(), pp. 1-28.

Ioannis, G., Fotis, K. and Maria, K. (2019) 'Digital Transformation and User Acceptance of Information Technology in the Banking Industry', 8th International Symposium and 30th National Conference on Operational Research, 4(), pp. 1-300 [Online]. Available at: https://docplayer.net/152552385-8th-international-symposium-and-30th-national-conference-on-operational-research.html [Accessed: 26 February 2020].

Gunawan, W. Tendi, W. and Sfenrianto, S. (2018) 'Assessing the Buyer Trust and Satisfaction Factors in the E-Marketplace', Journal of Theoretical and Applied

Electronic Commerce Research, 13(0718–1876), pp. 1-15 [Online]. Available at: https://scielo.conicyt.cl/pdf/jtaer/v13n2/0718-1876-jtaer-13-02-00105.pdf [Accessed: 26 February 2020].

Suthar, S (2019) How to Make E-commerce Checkout Process Convenient and Fast, Available at: https://thenextscoop.com/ecommerce-checkout-process/ [Accessed: 26 February 2020].

Johanson, V. Woolridge, R. and Bell, J. (2019) 'The Impact of Consumer Confusion on Mobile Self-Checkout Adoption', The official journal of the International Association for Computer Information Systems, 1(), pp. 1-200 [Online]. Available at: https://www.tandfonline.com/doi/full/10.1080/08874417.2019.1566802 [Accessed: 26 February 2020].

Grabner-Kräuter, S. and Kaluscha, A.E. (2008) 'Consumer trust in electronic commerce: Conceptualization and classification of trust building measures', Consumer trust in electronic commerce, 2(), pp. 1-74 [Online]. Available at: https://www.researchgate.net/publication/292009188_Consumer_trust_in_electronic_commerce_Conceptualization_and_classification_of_trust_building_measures [Accessed: 26 February 2020].

Yánez, W. (2017) 'Consumer Trust in E-commerce Environments', Consumer trust, 2(), pp. 1-18 [Online]. Available at: https://www.cs.bham.ac.uk/~rjh/courses/ResearchTopicsInHCI/2014-15/Submissions/yanez--wendy.pdf [Accessed: 26 February 2020].

Rosenfeld, R. and Morville, P. (16) (2015) Information Architecture, 4 edn., L Inside: Amazon.

Haddad, G., Shahab, A. and Aimeur. E. (2018) 'Exploring User Behavior and Cybersecurity Knowledge - An experimental study in Online Shopping', 6th Annual Conference on Privacy, Security and Trust (PST), 1(), pp. 1-22 [Online]. Available at: https://www.researchgate.net/publication/329064416_Exploring_User_Behavior_and_Cybersecurity_Knowledge_-_An_experimental_study_in_Online_Shopping [Accessed: 26 February 2020].

Haddad, G. Aïmeur, E. and Hage, H. (2018) 'Understanding Trust, Privacy and Financial Fears in Online Payment', Understanding Trust, 207(), pp. 1-43 [Online]. Available at: https://ieeexplore.ieee.org/abstract/document/8455883 [Accessed: 26 February 2020].

Tambo, E. and Kazienga, A. (2017) 'Promoting cybersecurity awareness and resilience approaches, capabilities and actions plans against cybercrimes and frauds in Africa', Security online, 1(), pp. 1-24 [Online]. Available at: https://go.aws/2T4BIYA [Accessed: 26 February 2020].

Lee, Y. Lu, S. Hsieh, Y. Chien, C. Tsai, S. and Dong, W. (2016) 'An empirical research on customer satisfaction study: a consideration of different levels of performance', customer satisfaction , 5(), pp. 1-76 [Online]. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5025411/ [Accessed: 26 February 2020].

Creswell, J. W. (1998). Qualitative inquiry and research design: Choosing among five traditions. Thousand Oaks, CA: Sage Publications.

Morse, J. M. (1994). Designing funded qualitative research. In Denizin, N. K. & Lincoln, Y. S., Handbook of qualitative research (2nd Ed). Thousand Oaks, CA: Sage.

Gustavsson, M. and Johansson, A. (2006) 'Consumer Trust in E-commerce ', Satisfaction vs Trust, 15(), pp. 1-85 [Online]. Available at: http://www.diva-portal.org/smash/get/diva2:230780/FULLTEXT01.%20%20%20%20%20%20%20%20%20%20pdf [Accessed: 26 February 2020].

Etikan, I. (2016) 'Comparison of Convenience Sampling and Purposive Sampling', American Journal of Theoretical and Applied Statistics, 5(1), pp. 1-4 [Online]. Available at: https://www.researchgate.net/profile/Sumanta_Deb2/post/Purposive_Sampling_and_Convenience_Sampling_are_these_two_types_of_Sampling_different_Please_Explain/attachment/59d64fc179197b80779a8d1c/AS:499559933505536@1496115777990/download/Comparison_of_Convenience_Sampling_and_Purposive_S.pdf [Accessed: 3 March 2020].

Nowell, L.S., Norris, J.M., White, D.E. and Moules, N.J. (2017) 'Thematic Analysis: Striving to Meet the Trustworthiness Criteria', International Journal of Qualitative Methods, 16(), pp. 1-13 [Online]. Available at: https://journals.sagepub.com/doi/pdf/10.1177/1609406917733847 [Accessed: 8 March 2020].

Dan J. Kim, Donald L. Ferrin, H. Raghav Rao (2008) 'Trust and Satisfaction, Two Stepping Stone for Successful E-Commerce Relationships: A Longitudinal Exploration', A Longitudinal Exploration, 20(20), pp. 2 [Online]. Available at: https://pubsonline.informs.org/doi/pdf/10.1287/isre.1080.0188 (Accessed: 11 May 2020).

Pan B, Ian R, Scott D, and James Mr, U (2011) 'Consumer Trust in E-Commerce Web Sites: A Meta-Study', A Meta-Study, 43(), pp. 3-14.

Tara Ebert (2009) Trust as the Key to Loyalty in Business-to-Consumer Exchanges, Gabler: Gabler Verlag.

Virginia B, Victoria C (2008) 'Using thematic analysis in psychology', Qualitative Research in Psychology, 3(2), pp. 77-101.
Nina Angelovska (2019) Top 5 Online Retailers: 'Electronics And Media' Is The Star Of E-commerce Worldwide, Available at: https://www.forbes.com/sites/ninaangelovska/2019/05/20/top-5-online-retailers-electronics-and-media-is-the-star-of-e-commerce-worldwide/#68e8a3171cd9 [Accessed: 2 June 2020].

Agnes Talalaev (2020) Website Hacking Statistics in 2020, Available at: https://www.webarxsecurity.com/website-hacking-statistics-2018-february/#:~:text=How%20many%20websites%20are%20hacked,that%20are%20unwittingly%20distributing%20malware. [Accessed: 2 June 2020].

Kiri Masters (2019) 89% Of Consumers Are More Likely To Buy Products From Amazon Than Other E-Commerce Sites: Study, Available at: https://www.forbes.com/sites/kirimasters/2019/03/20/study-89-of-consumers-are-more-likely-to-buy-products-from-amazon-than-other-e-commerce-sites/#41d238034af1 [Accessed: 2 June 2020].

Appendices

Appendix A - Prototypes

The interactive prototypes. (2020, April 24) Accessible at: https://xd.adobe.com/view/bd4e9d7a-206a-46a0-7221-ccc2d60bffde-cb7f/