



**CATÓLICA  
LISBON**  
BUSINESS & ECONOMICS

**The impact of Retailer Web Design on  
Purchase intention:  
A study between Continente and Pingo Doce.**

**Madalena Calça e Pina**

Dissertation written under the supervision of Prof. Paulo Romeiro.

Dissertation submitted in partial fulfillment of requirements for the MSc in Business at the  
Universidade Católica Portuguesa, 2 of January 2023.

## **ABSTRACT**

**Title:** The impact of Retailer Web Design on Purchase intention: A study between Continente and Pingo Doce.

**Author:** Madalena Calça e Pina

The world has been changing and consequently the behaviour of consumers and companies. Due to the increase of online sales and the urgent need to adapt to the electronic reality, all sectors are forced to re-invented and create new strategies to be successful not only in their offline stores but also in the online market. With this, it is necessary to apply efforts on websites and understand the perception of consumer behaviour. In this sense, this study focuses on the online grocery sector using two Portuguese supermarket websites for analysis.

This study aims to study the impact of web design on consumer purchase intention, mediating the effect of user experience. More precisely, this research analyses how distinct layouts of the same website can influence differently online consumer attitudes. Also, understand how the pragmatic and hedonic aspects impacts the user experience of online consumers.

For this, a questionnaire was conducted where the respondents were exposed to 4 stimuli, 2 images of real sites and other two images with the sites re-designed according to the improvements taken from the focus group and the literature.

The results obtained show that web design positively impacts intention to purchase, UX mediates the relationship between Web Layout and Purchase Intention, having pragmatic aspect a stronger effect than hedonic one.

**Keywords:** Web design layout, user experience, purchase intention, grocery sector online

## SUMÁRIO

**Título:** O impacto do Web Designer retalhista na intenção de compra: Um estudo entre o Continente e o Pingo Doce.

**Autor:** Maria Madalena Cordeiro Feio de Calça e Pina

O mundo tem vindo a mudar e, conseqüentemente, o comportamento dos consumidores e das empresas. Devido ao aumento das vendas *online* e à necessidade urgente de adaptação à realidade electrónica, todos os sectores têm vindo a ser forçados a reinventar para serem bem-sucedidos não só nas suas lojas *offline* mas também no mercado online. Com isto, é necessário aplicar esforços em websites e compreender a percepção do comportamento dos consumidores. Neste sentido, este estudo centra-se no sector das mercearias online, utilizando dois websites de supermercados portugueses para análise.

Este estudo visa estudar o impacto do design da web na intenção de compra do consumidor, mediando o efeito da experiência do utilizador, analisando como *layouts* distintos do mesmo *website* podem influenciar de forma diferente as atitudes dos consumidores.

Para tal, foi conduzido um questionário onde os inquiridos foram expostos a 4 estímulos, 2 imagens de *sites* reais e outras duas imagens com os *sites* redesenhados de acordo com as melhorias propostas no grupo de discussão e na literatura.

Os resultados obtidos mostram que o *design da web* tem um impacto positivo na intenção de compra, UX medeia a relação entre *Web Layout* e Intenção de Compra, tendo o aspecto Pragmático um efeito mais forte do que o Hedónico.

**Palavras-chave:** Web design layout, experiência do utilizador, intenção de compra, sector de retalho

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## **GLOSSARY**

Web Layout – WL

Web Design – WD

User Experience – UX

Purchase Intention – PI

Research Question – RQ

Independent Variable – IV

Dependent Variable – DV

Predictive Value – PV

## **CHAPTER 1: INTRODUCTION**

### **1.1 Background and Problem statement**

Online consumer purchase intention is a widely explored and researched topic. However, its relationship with web design layouts mediating the effect of user experience still does not present clear answers. Online consumption has been increasing over the years, being nowadays a big investment for companies to create a welcoming environment that will encourage customers to make good purchasing decisions (Manganari et al., 2009). However, just a few firms have the intention and knowledge to optimize their websites.

As a result of internet growth, there is now a closer connection between buyers and sellers all over the world. Due to the rapid advancement of technology, online shopping has become a particular source of interest and pleasure for consumers. Compared to most other business sectors, the influence of websites on the retail industry has been significantly more extraordinary (Kian et al., 2018a). Consumers, including grocery shoppers, are making the internet a significant channel for the delivery of shopping and service experiences because of the fast digitalization of the retail industry. (Singh, 2019)

Online grocery stores provide a huge selection of packaged and fresh goods. They also provide several other advantages, like decreased prices, cashback, accessible payment alternatives, and expedited delivery possibilities. For this reason, there is a high demand for online grocery shopping in Europe. It is expected that the Europe online grocery market to exhibit a CAGR of 16.50% during 2022-2027. (<https://www.imarcgroup.com/europe-online-grocery-market>).

Due to quick access to information and a wide range of options, consumers are less tolerant of inconsistent or unsatisfactory services online. If customers notice a difference in the experience quality offered, they don't hesitate to break off a connection with a company. (Antón et al., 2007). For this very reason, and being this a dynamic, complex, and competitive industry in which organizations provide products to consumers online on the internet (Kılıç & Şenol, 2010)., it is necessary that websites are designed according to client's needs so they can have the best user experience and consequently have a positive impact on consumers intention to purchase.

In this context, what if we could determine the impact of web design layouts on consumer purchase intent? What if retailers had the opportunity to change the layout of their websites according to their consumers' preferences?

This study has the objective of exploring whether web design layout exerts an effect on consumers' purchase intention mediating the effect of user experience on online grocery shopping. Also aims to understand what are the key factors that drive a positive user experience, analyzing in detail the hedonic and pragmatic aspects of UX.

In more detail, for this investigation, two specific Portuguese supermarkets will be analyzed: Pingo Doce and Continente. Given the distinct layouts of the two websites, it is believed that the influence of the layout on the consumer's purchase intention will be noticeable.

Regarding user experience, the pragmatic aspects will be analyzed according to the quality of usefulness and usability, whether hedonic aspects will be explored in an emotional or symbolic approach.

For this research, a questionnaire will be developed and appropriate tests will be applied.

In summary, the problem statement can be defined as:

How web design layouts impact the consumer's purchase intention. The effecting of user experience in grocery shopping.

RQ1: What is the most efficient layout for a retail food company to increase purchase intention?

RQ2: What are the elements that drive user experience in a retail food website?

### **1.3 Relevance**

Acceptance of online grocery shopping has been difficult for shoppers to accept for a long time, but it has been increasing a lot, so it is extremely important for the food retail industry to be able to create the best experience to induce the consumer to buy in their online stores. (Kian et al., 2018).

When studying online consumption in the grocery industry, it is important to understand that this sector has special diversities between consumption in conventional and online stores. In conventional stores, the stimuli used are very strong (points of sale close to payment centers, corners with products on promotion/new launches, etc.), so it is difficult for retailers to find strategies that maintain a positive consumer experience online.

To achieve the best online sales performance, it is crucial to know what the consumer values most during their experience with online grocery shopping, whereby a better user experience leads to a consumer with more purchase intentions. The results that will be found will then lead to finding the most efficient design for a homepage layout for Portuguese supermarkets that fulfill consumers' needs.

This study aims to present concrete proposals for the homepage layout and the specification of key elements in the development of the layout of a Portuguese online supermarket's homepage, taking into consideration the hedonic and pragmatic approach to user experience. Considering the positive support of the hypothesis, this investigation would have extreme relevance for managers that would focus on the findings and apply them to their websites to increase the consumer's purchase intention.

Furthermore, this research expands previous studies that were published in the literature, pretending to confirm that web layout has a positive impact on intention to purchase, that User Experience mediates the relationship between Web Layout and Purchase Intention and that Pragmatic User Experience has a stronger effect than Hedonic user Experience.

#### **1.4 Research methods**

This research uses primary data obtained through a questionnaire in order to have data to answer RQ1, RQ2 and RQ3. To analyze and understand "What is the most efficient layout for a retail food company to increase purchase intention", a linear regression will be used. Then, to test how user experience mediates the relationship between web layout and purchase intention a process model will be applied. Finally, an Analysis of Covariance, ANOVA, will be done to test if Pragmatic User Experience has a stronger effect than Hedonic user Experience.

## **1.5 Dissertation outline**

This dissertation is divided into three topics. The following chapter presents a literature review that supports the development of the hypothesis that will be the premise for this investigation. The literature review will also clarify and elucidate the connection between the dependent variable, Web Design Layouts, with the dependent variable, Purchase Intention mediating the effect of User Experience. The third chapter will be presented a detailed methodology that was used to answer the hypothesis. To be able to perform this study again, it would also be provided how data was collected, measured, and analyzed from the focus group and questionnaire. The fourth chapter will introduce and analyze the results from the questionnaire and clarify how to interpret the data. The final chapter identifies the limitation of this study and provides a conclusion that must be considered for future research in this field of research.

## **CHAPTER 2: LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK**

The literature review presents a theoretical framework for the subjects being studied in the research questions and objectives. Here, the topics were summarized, evaluated critically, and compared between previous articles and recognized journals. The first part of this chapter will focus on Web design Layout. Afterward, the concept of User Experience will be subdivided into Hedonic and Pragmatic, which will imply the clarification of Usefulness and Usability as crucial aspects of understanding UX. Finally, the intention to purchase will be discussed, and the conceptual framework will be provided.

### **2.1 Web Design Layout**

The layout design on the web, used by marketers when creating web interfaces to draw customer's behaviors, is also known as “the conscious designing of space to create certain buyer effects, specifically, the designing of buying environments to produce specific emotional effects in the buyer that enhance purchase probability” (*Kotler - Atmospherics as a Marketing Tool (Cité 171) - 1973, n.d.*).

The architecture of the online store is considerably impacted by changes in sales, demonstrating how different online shopping models affect consumers' capacity to make purchases online. Efficient layouts are crucial since they have a big impact on the retail environment. (Kadir & Wisetsri, 2021)

Marketers use a variety of cues, including physical layouts and directory signs, in brick-and-mortar retail settings to give customers an easy, pleasant, and delightful experience while they are in the store (Baker et al., 1994). In the same way, customers in an online retail context also need to have a positive experience when navigating retailers' websites.

According to past studies, consumer beliefs and attitudes are significantly more influenced by the design elements of a virtual online retailer than they are by the parts and arrangements of a physical store. (Kadir & Wisetsri, 2021) Also, 65% of website visitors would not use a poorly created website, not even if it is a favorite brand. Even low prices couldn't persuade more than 4% to shop on a bad site, and 30% said that the website's layout is more important than the need for the product. (Gupta & Singh, 2019)

In fact, to provide convenience and attractive online stores and improve their sales, e-tailers have adapted the merchandising methods that are often employed in traditional shopping environments. (Lorenzo et al., 2007). However, just a few firms have the intention to optimize their websites. Usually, organizations choose to either duplicate popular websites or build websites that reflect their offline businesses rather than creating virtual locations that improve the experience for online buyers (Rosen & Purinton, 2004).

The visual impact of a web page can have a significant influence on user experience and has important implications for effective communication (Hoffmann & Krauss, 2004) what could give retailers a competitive edge. (Alba et al., 1997) But how can retailers create online interfaces that work well? Web layout could provide some interesting answers to this (Dailey, 2004).

Due to the importance of this subject and the rapid expansion of online retailers, some writers are concentrating their research on the study of an "extended" term that we might name Web atmospherics. (Lorenzo et al., 2007)

In fact, an efficient web design could give retailers a competitive edge. (Alba et al., 1997) But how can retailers create online interfaces that work well? Web atmospherics could provide some interesting answers to this (Dailey, 2004).

The word atmospherics was once used to describe the environment and design of a store, but today, it is also used in e-commerce to describe the layout of web design. (Abbott et al., 2000)

To illustrate the influence of web layouts on consumers, most authors use the Stimulus-Organism-Response paradigm (Mehrabian & Russell, 1974) and suggest that atmospheric cues affect consumers' internal states, which ultimately influence behavioral responses related to online shopping. According to the S-O-R theory (Donovan, n.d.), the web layout can be operated as the Stimuli (S) that are linked with the consumer's reactions to Organisms (O) that result in behaviors as the Response (R).

(Kim et al., 2011) used the stimuli-organism-response (S-O-R) model from environmental psychology and incorporated the concepts of the consciousness-emotion-value model and cognition-affect-behavior model. They looked at, among other things, how store layout affected cognitive states as a stimulus design factor (e.g., beliefs, perceptions, and others).

Despite needing other structures, as well as in physical shops stimuli are used, the pages of the sites should also show the functionalities of the shop and provide information about its products. (H. H. Chang & Chen, 2008) (Vrechopoulos A, 2010).

The degree of the informational value of a website's content can be assessed by looking at how thoroughly and precisely it covers a range of important subjects or items. Also, that specific product information was tied to how people felt about the website in a positive way. (Richard, 2005)

According to (Nielsen, 2006), websites typically follow "internal schemes" that are unknown to users at the outset. In this context, he also found that users primary reading behavior was largely similar across a wide range of websites and tasks. This dominant reading pattern resembled an F and contained the following three elements:

1F's Top Bar: Users typically begin reading horizontally across the upper portion of the content area.

2F' Lower Bar: The user reads across the page in a second horizontal movement, using which typically covers a smaller section than the first.

3F': Users then scan the left side of the content vertically.

On an eye-tracking heat map, this can occasionally be seen as a solid stripe, as it is a rather slow and methodical perspective. Sometimes users move more quickly, producing a heat map with more blotchy areas. In this context, the F's lower bar on the e-commerce pages is lower than usual due to the interstitial product image. Users also spend a lot of time looking at a box in the top right corner of the page, which often contains the price and "add to cart" buttons (Nielsen, 2006).

## **2.2 User Experience**

The success of a business depends on how quickly it adopts new technology and uses it to improve the shopping experience for customers. (Patel et al., 2021) The web has transformed

the world into a smaller, more globalized space where people can now easily create emotional relationships and communicate regardless of distance (Gaver & Martin, 2000).

Nowadays, websites and apps have the potential to allow people to do "house tasks" or other menial jobs in the same place and in a more effective and productive way. Having said that, user experience design has started to attract substantial attention in the online ecosystem.

Although each designer/researcher has their own point of view on the dimensions that impact user experience, according to (Zarour & Alharbi, 2017) and (Hassenzahl, 2008a) model, UX can be analyzed in mostly two categories' aspects: Hedonic and Pragmatic.

Primary user experience can be defined as the “consequence of a user’s internal state (predispositions, expectations, needs, motivations, mood, etc.) the characteristics of the designed system (e.g., complexity, purpose, usability, functionality, usefulness.) and the context (or the environment) within which the interaction occurs (e.g., organizational/social settings, the meaningfulness of the activity, voluntariness of use, etc.).” (Hassenzahl & Tractinsky, 2006).

Also, ISO 9241–210 defined user experience as “A person’s perceptions and responses that result from the use or anticipated use of a product, system or service” (Standardization, 2010)

Certainly, one of the most crucial concerns to answer when looking into aspects of user experience is: “how the overall quality or the “goodness” of an interactive product is formed, given pragmatic that are related to the usability and the do-goal qualities and hedonic aspects, related to the stimulation and be-goal qualities, underlying needs” (Hassenzahl & Tractinsky, 2006)(Zarour & Alharbi, 2017).

### **2.2.1 Pragmatic User Experience**

Pragmatic attributes are directed toward achieving goals and they are referred to the efficient and rational decision making (Batra & Ahtola, 1991) . Therefore, the pragmatic approach focus on elements such as menus, clear displays of page contents, the presence of a shopping cart, the company logo, and images of the product as thumbnails, links, and icons. (Hassenzahl, 2008b)

(Song & Zinkhan, 2003). For this reason, when studying UX is essential to consider the pragmatic category in relationship with utility/usefulness and usability aspects. (Hassenzahl, 2008b) (Zarour & Alharbi, 2017) (Song & Zinkhan, 2003a)

In this context, we can now present the idea of usability. Although some researchers try to provide an extensive explanation, it is not easy to define usability. However, a common definition is applied in literature and is going to be crucial for this study: Usability as the perceive Ease-of-Use.

For some researchers, the alleged simplicity of internet browse (Davis, 1989a). For others, the representation of the facility and usefulness of internet access: “Usability is a quality attribute that assesses how easy user interfaces are to use. This concept has been studied and comprehended in terms of ease of use and refers to methods for improving ease-of-use during the design process.” (Nielsen, J. (2003) ‘Usability 101’, <http://www.useit.com>) (Song & Zinkhan, 2003b) For this reason, usability has a huge impact on UX. Users are likely to choose an alternative solution if they are unable to achieve their goals effectively, efficiently, and satisfactorily, since it has been discovered in several studies that usability is a crucial component in achieving desired internal and behavioral responses (e.g., (Childers et al., 2001); (O’cass & Fenech, 2003); (Eroglu et al., 2003).

A product or service can result in an unpleasant experience if it is unclear, ineffective, and useless. On the other hand, an enjoyable, fun, exciting or delightful perception will result in a positive experience. (Cyr et al., 2018). So, when studying the pragmatic aspects of User Experience, the concept of Usefulness also needs to be fully exposed.

In this context, some studies demonstrated that when analyzing the change of pragmatic and hedonic perception over the time of a usability test, it is shown that the initial perception of hedonics decreases over time while pragmatic increases (Hassenzahl, 2001). Also, when making a purchase, consumers could prioritize the practical qualities of an interactive product above the less crucial hedonic attributes. (Hsee et al., 2003)

Heijden (2000, p. 417) proposes that "the perceived usefulness in a website setting is defined as the degree to which an individual believes that accessing the site would contribute to accomplishing a particular purpose" when extrapolating to the internet (i.e., planned purchases in the case of the present study). According to Seiders, Berry, and Gresham (2000), website design may have an impact on consumers' intended purchase behavior.

Perceived usefulness (PNU) and perceived ease of use (PEOU) are the two behavioral beliefs that drive TAM and have also a influence on behavioral intentions (PU). The perception of how user-friendly a certain system or program is can be referred to as PEOU (Davis, 1989b). Most of the time, PEOU has little to no impact on behavioral intentions, or its impact is largely mitigated by PU (Kaplan et al., 2007) (Venkatesh & Morris, 2000).

For all these reasons it can be understood that pragmatic value is a crucial component of the experience, but UX strives for a holistic viewpoint that covers supplementary goals such be-goals in addition to instrumental ones.

### **2.2.2 Hedonic User Experience**

According to the definition, hedonic characteristics are those that deal with the pleasure and emotion induced by sensory appeals.(Batra & Ahtola, 1991) .

Hedonic attributes of user experience stand for the psychological needs and emotional experience of the user. This attribute of user experience can be perceived by some authors as as novelty directly related to “Stimulation”, relatedness closely associated with “identification”, and symbolizing immediately connected with “evocation”. (Ryan & Deci, 2000; Schwartz & Bilsky, 1987; Sheldon, Elliot, Kim, & Kasser, 2001; Malone, 1984, logan, Augaitis, & Renk, 1994; Jordan, 2000; Gaver & Martin, 2000).

This concept is also linked with confidence and credibility are categorized as Human Factors on the web and should also be taken into consideration to fully understand this hedonic dimension of UX. (Ryan & Deci, 2000). Therefore, according to the literature Hedonic qualities refer to consumption behavior with an emotional view to fun, exciting, delightful, enjoyable in the act of purchase that are chosen as the chore attributes for this study.

Consumers buy items not only for their pragmatic experience but also for the pleasure experience while making the purchase (Tauber, 1972). However, some studies demonstrated that when analyzing the change of pragmatic and hedonic perception over the time of a usability test, it is shown that the initial perception of hedonics decreases over time, while pragmatic increases(Hassenzahl, 2001). Also, when making a purchase, consumers could prioritize the practical qualities above the less crucial hedonic attributes. (Hsee et al., 2003)

### **2.3 Purchase Intention**

In this context the concept of purchase intention can be now interpreted. Intentions are characterized as a person's subjective assessments of an object to act in a particular way in response (Ajzen & Fishbein, 1975). Therefore, online purchase intentions are the likelihood that a buyer will engage in a specific purchasing action online (Salisbury, Pearson, Pearson & Miller, 2001).

As referred above, Online consumption has been increasing over the years, being nowadays a big investment for companies to create a welcoming environment that will encourage customers to make good purchasing decisions (Manganari et al., 2009). However, the growth of the online purchase intention is not the same for all industries.

When analysing the purchase intention to buy in the industry of supermarkets the values are not so high as in other sectors as, for example, in fashion. Even though there are currently e-grocers and traditional grocers that offer electronic grocery shopping, consumers still prefer to walk into a physical traditional or modern supermarket to buy food. When compared to online grocery shopping, the average rate of online shopping is higher. According (Kian et al., 2018b) not everyone finds that doing their grocery shopping online completely replaces their regular trips to the supermarket. But all depends on the circumstances. According to the literature, there were significant changes in this sector in pre and during covid-19, when consumers of all generations were more inclined to purchase goods and services digitally during this time because customers had the option of receiving food at their houses, avoiding interaction, and lowering their risk of contracting the virus. (Jlková & Králová, 2021) ((Gomes & Lopes, 2022). Therefore, the pandemic warned the retailers about the importance of optimize their websites and forces this industry to invest in the efficiency of their online pages. Efficient layouts are crucial since they have a big impact on the retail environment. (Kadir & Wisetsri, 2021)

In this context is essential to understand how consumers' intention to purchase changed in online food shopping, how their habits swap during the COVID-19 pandemic and its future implications on retail food markets. According to the most recent Adobe Digital Economy Index survey, the pandemic increase by a large amount the number of consumers that choose through grocery websites or apps. (Forbes)

Other results show that in Portugal, the values of revenues for food and personal care that are purchase online almost increase 100% from 2017 to 2022 and are expected to continue to grow in the future (Statista). Also, according to a survey by Klarna. Insights, conducted in February 2022, 47% of respondents believe that they will mostly shop online within a year, indicating a

growing preference for online shopping, and 15% of Portuguese consumers shop online at least once a week.

To forecast customer acceptability and purchase intention for online grocery shopping, the TAM (Technology Acceptance Model) is also sometimes used since it assumes that perceived usefulness and usability have an impact on how well new technology is received. (Driediger & Bhatiasevi, 2019). Therefore, the relation between user experience and purchase intention is clear.

Online shopping platforms are becoming more user-friendly, which is contributing with the increase in online sales. The layout of the online store is considerably impacted by changes in sales, demonstrating how different online shopping models affect consumers' capacity to make purchases online. (H. Chang & Meyerhoefer, 2021)

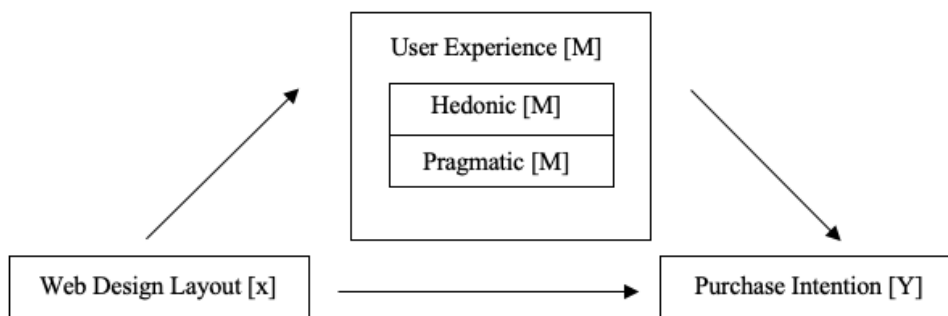
According to the mention, the following hypotheses are formulated:

H1: Web Layout positively impacts Purchase Intention.

H2: User Experience mediates the relationship between Web Layout and Purchase Intention.

H3: Pragmatic User Experience has a stronger effect than Hedonic user Experience

## 2.4 Conceptual Framework



*Figure 1 - Conceptual model*

## **CHAPTER 3: METHODOLOGY**

The present chapter has the goal of answering the mentioned hypothesis and the research questions. The first section of the chapter covers the general approach that has been utilized to develop the hypotheses and how the research applies secondary data, while the second section of the chapter covers in more detail the focus group and survey design.

### **3.1 Research Approach**

As mentioned in chapter 1, the main objective of this study is to understand the impact of the web design layout on consumers' purchase intention, discovering what is the most efficient design layout for a grocery shop homepage. To answer RQ1 and RQ2 and find relationships between the mentioned variables, the preliminary step was to review secondary data in the form of the existing literature to date. Thus, the secondary sources offered background information on the subject and served as the foundation for the creation of the hypotheses and constructs. Then, a research approach was applied to help to develop an operational model from the conceptual framework and the hypothesis.

Firstly, the selecting of the industry was the first choice to be made, then to avoid possible researcher bias, a focus group was performed to discuss how participants would perceive different web layouts to generate insights about the pragmatic and hedonic aspects of UX and to use one more in the main questionnaire.

Thirdly, two stimuli were created to be further included in the main study by considering the two Portuguese supermarket layouts and the focus group's findings. This method was crucial to determine whether the stimuli were appropriately created to be received as predicted and determine whether any revisions were required. Finally, an online questionnaire was employed.

Variables	Article Name and Author	Nº Intems	Scale
Layout Design	“How can online store layout design and atmosphere influence consumer shopping intention on a website?” Wu W, Lee C, Fu C et al.	4	7-point semantic differential scale
Pragmatic UX	“E-wom, trust, usefulness, ease of use, and online shopping via websites: the moderating role of online shopping experience” Eneizan B. Alsaad A. Alkhawaldeh A. et al.	7	5-point Likert scale
Hedonic UX	Consumer’s perceptions of website’s utilitarian and hedonic attributes and online purchase intentions: A cognitive-affective attitude approach “  Moon M, Khalid M. Awan H et al	5	5-point Likert scale
Purchase Intention	“How can online store layout design and atmosphere influence consumer shopping intention on a website?”  Wu W, Lee C, Fu C et al.	4	7-point Likert Scale

*Table 1 - Operational Model*

For the focus group, two screenshots of the first screen view of the Pingo Doce and Continente website were provided. The screenshots were taken on 22/10/2022 at 16:01 for the purpose of this study.



*Figure 2 - Real site Pingo Doce*



*Figure 3- Real site Continente*

### 3.2 Secondary Data

In this chapter would be provided the methodology of data collection, stimuli development and measurements that was used to understand the impact of web design layouts in the intention to purchase mediating the effect of UX. Also, the hedonic and pragmatic attributes would be tested in the questionnaire in order to understand which aspect has more impact when related to the intention to purchase online.

#### 3.2.1 Data Collection & Stimuli Development

First, a focus group was created to understand the preferences of consumers regarding the homepage of an online supermarket homepage. The focus group was developed in 1on1 meetings of 8 people and provide important information that was used to develop the stimulus. The real homepages of Pingo Doce and Continente (two Portuguese supermarkets) were provided with the challenge of improving them. In order to have clear answers some questions as “How would you improve these websites? What organization and elements do you prioritize in order to have an easy to use and usefulness experience?” were asked. The 4 stimulus was created using Adobe Photoshop program to make the homepage look as real as possible when used in the survey.

Then, 4 stimulus were presented in the questionnaire so that the results would be as real and precise as possible. Two of the stimuli represent the real sites of Continente and Pingo Doce and the other two are redesigns of the sites according to the results obtained in the focus group. The main goal of this study was to understand of people react to different layouts of supermarkets’ websites.

So, to find results and conclusions that help to understand the exposed hypothesis, a survey was created and shared via social media platforms as Facebook, Instagram, LinkedIn and Whatsapp from 21 of November to 19 of December.

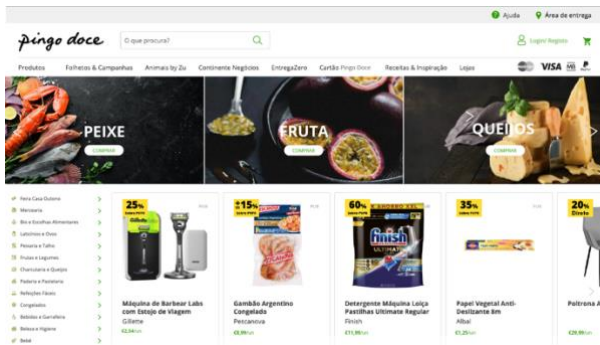


Figure 4 - New site Pingo Doce

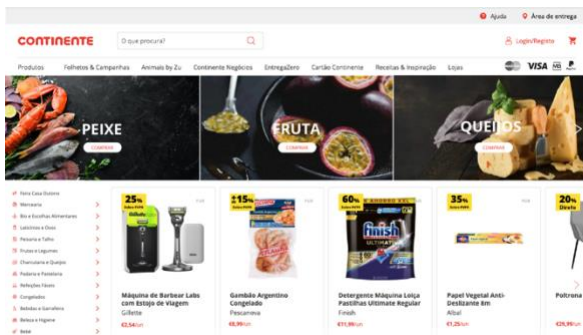


Figure 5 - New site Continente

### 3.2.3 Measurement / Indicators

The measurements for the constructs of the mediator UX and the dependent and independent variable: Web Design layout and Purchase intention are discussed in this paragraph.

The four stimuli were randomly allocated to the responses and represented websites pages with real and new created versions. A group was exposed to the real Pingo Doce website page (Figure 2), another one to the real Continente website page (Figure 3), another one to new Pingo Doce (Figure 5) and other group to New Continente (Figure 6). Then, each respondent was required to evaluate the website image that was previously displayed by express their desire to make a purchase also referring their experience as a user.

Web design layout variable was tested through four items on a 5- semantic scale based on a study of Wu et al., 2013: From Unorganized to Organized, Bad product displays to good product displays, Limited selection to large selection, Unhelpful signs to Helpful signs.

Also, to identify the respondents 'perception of user experience, a construct of usefulness and easy-of use (usability) was applied to a pragmatic approach. Firstly, the Usefulness construct has been assessed through the 4 selected items on a 5- Linkert scale from the study of (Eneizan et al., 2020) "This website would help me to purchase products faster", "This website would improve my performance in purchasing products", "This website would increase my productivity in purchasing products", "This website would increase my effectiveness in purchasing".

Then, to test the usability of the webpages a construct from Abu-Shanab, 2014 had been use containing 3 items in a 5-point Linkert scale: "Shopping via this website would be easy to me", "Shopping in this website would be clear and understandable", "It would be easy to me to get what I need from this website".

After, to understand the hedonic perception of user experience, five items were measured on a 5-point Likert scale (anchored from strongly disagree = 1 to strongly agree=5) and assessed from Moon M, Khalid M Awan H et al. study. "Shopping on this website would be fun.", "Shopping on this website would be exciting.", "Shopping in this website would be delightful", "Shopping in this website would be thrilling.", "Shopping in this website is enjoyable."

Finally, to measure purchase intention, a construct used by (wu et al., 2013) was applied in form of 5 items: "If I need the product, I intend to purchase on this website in the near future", "If I need a product, I would be very likely to purchase on this website in the near future", "If I need a product, I would plan to purchase on this website in the near future", "If I need the product, I would consider purchasing on this website in the near future." Using a 5-point Likert Scale.

### **3.3 Data Analysis**

To quantitatively investigate the presented assumptions above shown, the research survey design was applied with two conditions: Pingo Doce website and Continente website, each with two levels: real web layout and new web layout. (Presented in the table below). The questionnaire divided randomly the participants into one of the four groups.

	Real Website	New Website
Continente	Real Continente Website	New Continente Website
Pingo Doce	Real Pingo Doce Website	New Pingo Doce Website

The questionnaire (Appendix. 1) was active from 21 November 2023 to 19 December 2023 and SPSS was used to evaluate all the quantitative data that was gathered. The survey begins by assuring confidentiality issues, explaining that the questionnaire is developed within the academic environment for the purpose of the final thesis of the Master of Business at Católica Lisbon School. Participants are also warned of the questionnaire's duration, less than 3 minutes. Then, in the first question, participants were asked whether they have ever done any supermarket shopping online, and if so, how many times a month. After this, the participants saw one of the four images used as stimuli and are given a reminder to analyse aspects such as: product displays, list of categories, product prices and promotions and payment options to make sure they understand the stimulus and answer carefully. From here on, until the categorization questions, all participants answered the same questions, however, each in relation to the image they were assigned. They were asked how they perceived the layout presented in the image, among other questions that would be used to test user experience (pragmatic and hedonic) and purchase intention. Then, categorization questions such as gender, age and nationality were presented. After this, having all the answers and at least 50 per stimulus, the data analysis could be carried out. For the analysis of H1, a linear regression was developed. For this, the qualification of the analysis values of the indicators in the internal consistency were performed according to the following indications: values below 0.6 are considered unreliable, values between 0.6 and 0.7 as weak reliability, between 0.7 and 0.8 as reasonable reliability, between 0.8 and 0.9 as good reliability and above 0.9 consistency is considered very good. (Pestana & Gageiro, 2008)

For H2 to test how user experience mediates the relationship between web layout and purchase intention a process model was applied and will be demonstrated in the next chapter.

To conclude the analysis, an Analysis of Covariance, ANOVA, will be tested to verify if Pragmatic User Experience has a stronger effect than Hedonic user Experience.

## **CHAPTER 4: RESULTS AND DISCUSSION**

The analysis of the quantitative data will be presented in the following chapter. The analysis will start with a description of the entire sample and a reliability test, then test each hypothesis and give the statistical findings.

### **4.1 Manipulation check**

Before starting the tests that will be presented throughout this chapter, the excel file was exported through the Qualtrics platform. It was worked on so that repeated IP's addresses corresponding to the same respondent's email were eliminated in order to obtain the most reliable results possible. After this, all the answers were transformed according to a pattern of numbers so that the analysis could be carried on SPSS.

Before testing, it was also necessary to perform a manipulation check to see if the respondents understood the different stimulus. For this, the averages of the four answers for the web layout indicator questions were compared. The results showed that for the real Continente stimuli the average was 3.089285714 while for real Pingo Doce the average was lower, 2.86637931. For the new stimulus, according to the results the average of new Continente was 3.674528302 very closely with new Pingo Doce that present values of 3.659482759.

In this way, as the new stimulus present higher averages we can conclude that the respondents identified the sites correctly. Considering the new websites as more organised, with better layout and with more indication signs as expected. Consequently, it was assumed that they responded in a careful and conscious way to the presented stimulus.

### **4.2 Sample categorization**

In this study, the population under analysis is mostly Portuguese consumers or future consumers of online supermarket since it has based on two Portuguese supermarket.

In total, 322 answers were collected. Of these, the valid study sample is composed of 211 respondents, the majority being 74.4% female and prevalently young, with 61.6% between 18 and 24 years and 12.8% between 25 and 34 years. However, respondents between 55-64 years old also had an important presence in the analysis (14.2%). In terms of education the majority

have higher education studies, namely 42.7% Bachelor's degree, 41.2% Master's degree and 0.5% Ph. Almost all of them are Portuguese, namely 93.4% (Table 2).

The sample is equally and random divided by the four stimulus presented, with 24.6% responding to the real stimulus from Continente, 25.1% to the real stimulus from Pingo Doce, 24.6% to the new stimulus from Continente and 25.6% to the new stimulus from Pingo Doce. Of the 211 participants, 27.5% had never made purchases online, while the majority of 72.5% had already done so. Of the latter (n=153), 56.9% did it once a month, 26.8% four or more times a month and 16.3% two to three times a month (Table 3).

	N (%)
<b>Gender</b>	
Female	157 (74,4)
Male	51 (24,2)
Other	3 (1,4)
<b>Age</b>	
< 18 years	3 (1,4)
18-24 years	130 (61,6)
25- 34 years	27 (12,8)
35-44 years	6 (2,8)
45-54 years	12 (5,7)
55-64 years	30 (14,2)
≥ 65 years	3 (1,4)
<b>Education Level</b>	
High school diploma	33 (15,6)
Bachelor's degree	90 (42,7)
Master's degree	87 (41,2)
Ph.D degree	1 (0,5)
<b>Nationality</b>	
Portuguese	197 (93,4)
German	1 (0,5)
Brazilian	2 (0,9)
Other	11 (5,2)

*Table 2 - Sample Categorization (N=211)*

		N (%)
<b>Stimuli</b>		
	Real Continente	52 (24,6)
	Real Pingo Doce	53 (25,1)
	New Continente	51 (24,6)
	New Pingo Doce	54 (25,6)
<b>Supermarket Shopping online</b>		
	No	58 (27,5)
	Yes	153 (72,5)
<b>Supermarket Shopping online frequency</b>		
	Once a month	87 (56,9)
	2-3 times a month	25 (16,3)
	4 or more times a month	41 (26,8)

Table 3 - Stimulating conditions and online shopping (N=211)

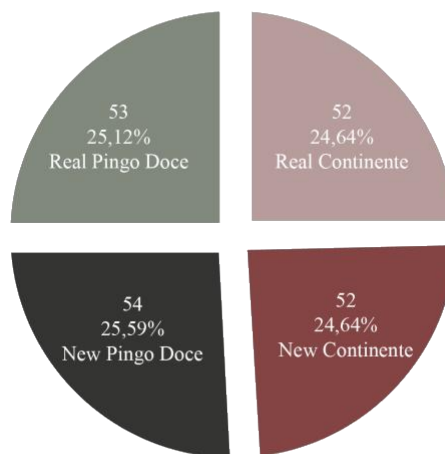
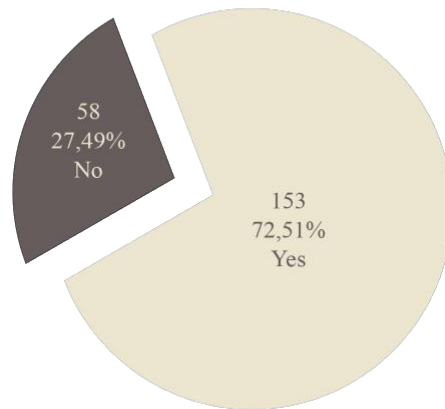
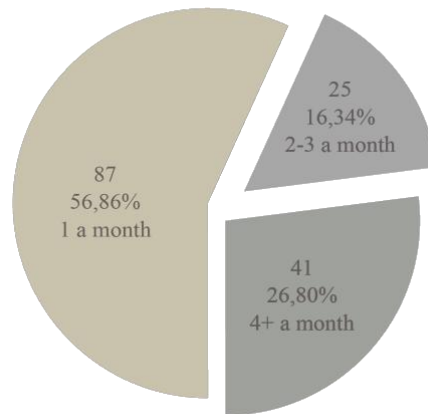


Figure 6 - Sample distribution by stimulus



*Figure 7 - Making purchase online*



*Figure 8 - Frequency of online purchases*

### **4.3 Measure Reliability**

Furthermore, a Cronbach's alpha test was performed to assess the consistency and reliability of the variables employed in this study. Despite the fact that all constructs were taken from literature review and that high values have been verified it is crucial to ensure the validity of the data again.

All things considered, the internal consistency of the indicators Web Layout, Pragmatic User Experience, Hedonic User Experience and Purchase Intention was assessed by Cronbach's Alpha measure. The values presented in Table 4 show that was proved to be good to very good, offering validation conditions for the construction of indicators, being these calculated based on the average of the answers of the respondents to the set of questions included in each indicator. Also, the Cronbach's alpha analyzed in all constructs presents values above 0.8, meaning that they are credible enough to proceed with the analysis and predict the variables. More precisely, web design presents a Cronbach's alpha of 0,837 being this consider as good predictor, user experience in general presents a value of 0,967

(very good) with a hedonic aspect of user experience with very good Cronbach's alpha of 0,948 however lower than a pragmatic aspect of user experience of 0,961.

As a note, the set of questions showed a good index of discrimination between individuals, with all items showing values of Correlated item total correlation higher than 0.555, satisfying the most conservative criteria of (Francis & White, 2002).

Finally, Table 5 shows the results for Web Layout, Pragmatic User Experience, Hedonic User Experience, User Experience and Purchase Intention for each of the stimuli, by real or new condition and total. From its reading, it is generally observed that the new values are higher than the real ones, either by supermarket or in general. It is also important to highlight that Pragmatic User Experience was calculated through the sum of Q3 and Q4, being the value of Cronbach's alpha a result of data from easy to use and usability, the two aspects that were used to define pragmatic from the literature.

With this frame of reference User Experience was also calculated through the sum of pragmatic aspects (Q3 + Q4) with hedonic aspects (Q5).

Indicator	Questions	Nº Item	Cronbach's alpha	
Web Layout	Q2	4	0,837	Good
Pragmatic User Experience	Q3 + Q4	7	0,961	Very Good
Hedonic User Experience	Q5	5	0,948	Very Good
User Experience	Q3 + Q4 + Q5	12	0,967	Very Good
Purchase Intention	Q6	4	0,946	Very Good

*Table 4 - Internal Consistency*

Stimuli		N	Web Layout		Pragmatic User Experience		Hedonic User		Purchase Intention		User Experience	
			Min-Max	M ± SD	Min-Max	M ± SD	Min-Max	M ± SD	Min-Max	M ± SD	Min-Max	M ± SD
Real	Continente	52	1-5	3,07 ± 1,00	1-5	2,85 ± 1,10	1-5	2,77 ± 1,14	1-5	2,93 ± 1,08	1-5	2,81 ± 1,12
	Pingo Doce	53	1-4,50	2,85 ± 0,94	1-5	2,97 ± 1,02	1-5	2,54 ± 1,00	1-5	2,78 ± 1,12	1-5	2,75 ± 0,91
	Total	105	1-5	2,96 ± 0,97	1-5	2,91 ± 1,06	1-5	2,66 ± 1,07	1-5	2,85 ± 1,10	1-5	2,78 ± 1,01
New	Continente	52	2-5	<b>3,70 ± 0,88</b>	1-5	<b>3,68 ± 0,98</b>	1-5	<b>2,78 ± 1,07</b>	1-5	<b>3,17 ± 1,30</b>	1-5	<b>3,23 ± 0,96</b>
	Pingo Doce	54	1-5	<b>3,69 ± 0,98</b>	1-5	<b>3,61 ± 1,03</b>	1-5	<b>2,88 ± 1,03</b>	1-5	<b>3,38 ± 1,01</b>	1,10-5	<b>3,24 ± 0,98</b>

Total	106	1-5	<b>3,69</b> ± <b>0,93</b>	1-5	<b>3,64 ±</b> <b>1,01</b>	1-5	<b>2,83</b> ± <b>1,05</b>	1-5	<b>3 27</b> ± <b>1,16</b>	1-5	<b>3,24</b> ± <b>0 96</b>
Total	211	1-5	3,33 ± 1,02	1-5	3,28 ± 1,09	1-5	2,74 ± 1,06	1-5	3,07 ± 1,15	1-5	3,01 ± 1,01

*Table 5 - Descriptive indicators by stimulus*

#### **4.4 Inference Statistics**

In this chapter the results from the hypotheses testing will be presented according to the several statistical tests that were run to determine the validity of the hypotheses and to better understand the links between the predictor factors and the result variable.

For the first analysis, according to the conceptual model, a linear regression was applied to test how Web Layout positively impacts Purchase Intention. Then, to test how User Experience mediates the relationship between Web Layout and Purchase Intention, a mediation was conducted. Finally, an ANOVA was used to test if Pragmatic User Experience has a stronger effect than Hedonic user Experience.

##### **4.4.1 Hypothesis 1**

###### ***Web Layout positively impacts Purchase Intention***

A linear relationship is observed between Web Layout and Purchase Intention (Figure 9), with the emergent correlation being positive, significant and of moderate intensity ( $R=0.500$ ;  $p<0.001$ ).

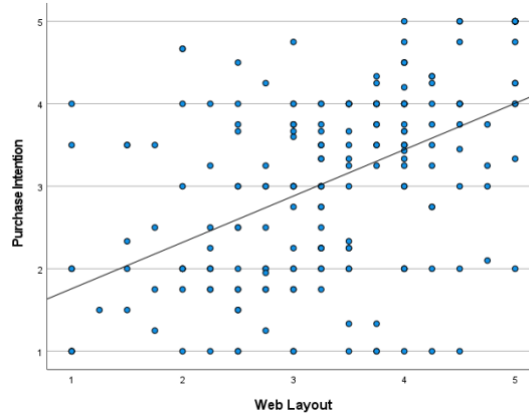


Figure 9 - Linear Regression

In order to assess the impact of Web Layout on Purchase Intension, a simple linear regression model was performed (Table 6), with Web Layout as predictor. A significant and valid model was obtained ( $F(1, 209)=69.592$ ;  $p<0.001$ ), where Web Layout explains 25.0% ( $R^2=0.250$ ) of the variation in Purchase Intension. Web Layout is also found to be a significant predictor of Purchase Intension having a positive impact on it. ( $B=0.562$ ;  $t=8.342$ ;  $p<0.001$ ). Per increasing unit of web design quality, the purchase intention impacts an increase of 0.562 units. This validates the study of hypothesis 1.

	Unstandardized Coefficients			ANOVA		Model Summary		
	B	t	Sig.	F	Sig.	R	R <sup>2</sup>	R <sup>2</sup> <sub>Adj.</sub>
(Constant)	1,196	5,105	<0,001	69,592	<0,001	0,500	0,250	0,246
Web Layout	0,562	8,342	<0,001					

Table 6 - Simple Linear Regression Model of the WL predictor on PI

#### 4.4.2 Hypothesis 2

##### *User Experience mediates the relationship between Web Layout and Purchase Intention*

In order to fully understand the tests made for H2 it is important to start by understanding that mediation is a regression. In this sense a) represents the mediation of Web Layout over User Experience and b) the mediation of User Experience over Purchase Intention.

Thus, c) is the total effect, that is, the effect of Web Layout on Purchase Intention without the existence of a mediator. Contrarily, c') is the effect of Web Layout on Purchase Intention but in the presence of the mediator.

When the Web Layout variable ceases to have a direct effect (c') on Purchase Intention in the presence of the mediator, mediation is said to be complete, that is, Web Layout only impacts Purchase Intention via the mediator; that is, in the ab direction.

So, to verify whether User Experience mediates the relationship between Web Layout and Purchase Intention, we conducted a mediation model with Web Layout as predictor, User Experience as mediator and Purchase Intention as dependent variable (Figure 10).

A valid and significant mediation model was obtained (Table 7) ( $F_{(1, 208)}=169.2362$ ;  $p<0.001$ ) that explains 61.94% of the variation in Purchase Intention ( $R^2=0.6194$ ). The mediation observed is total, insofar as the presence of the mediator User Experience makes the effect of web Layout on Purchase Intention no longer statistically significant ( $B=-0.0570$ ;  $P=0.305$ ).

Thus, the effect of web layout on Purchase Intention occurs indirectly, via the mediator user experience, and the impact on Purchase Intention is positive and significant ( $B=0.6189$ ; CI 95% [0.4987;0.7418]). Consequently, Hypothesis 2 is validated.

		User Experience	Purchase Intention (DV)
IV	User Experience		(b) $B=0,9273^{***}$ $p<0,001$
Med	Web Layout	(a) $B=0,6674^{***}$ $p<0,001$	(c') $B=-0,0570^{ns}$
			$p=0,3805$
	Indirect effect	(ab) $B=0,6189$	(c) $B=0,5618^{***}$ $p<0,001$
			CI 95% [0,4987;0,7418]
	Model	$F_{(1, 208)}=169,2362$	$p<0,001$ $R^2=0,6194$

<sup>ns</sup> non significant    <sup>\*\*\*</sup> Significant for  $p<0,001$     c.Total Effect    c'.Direct Effect    ab.Indirect Effect

Table 7 -Mediating process model

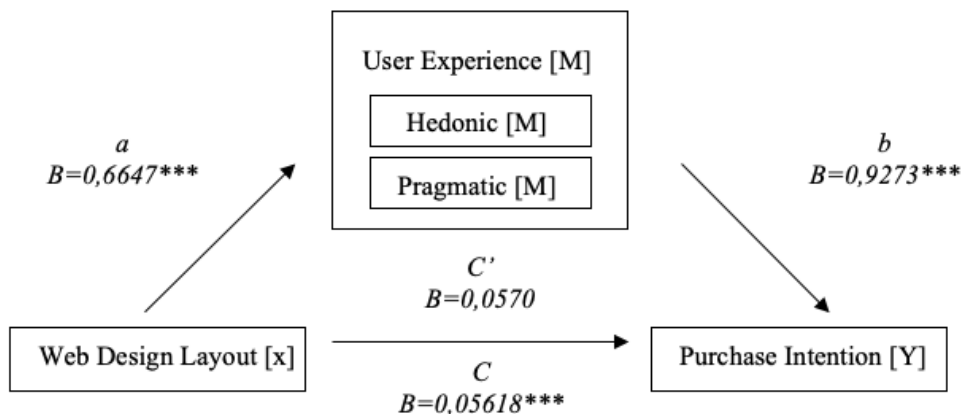


Figure 10 - Effect of WL on PI mediating UX

### 4.4.3 Hypothesis 3

#### *Pragmatic User Experience has a stronger effect than Hedonic user Experience*

To test H3 an ANOVA was run with repeated measures due to the 5 paired samples. The sphericity is an assumption of this ANOVA and it is seen through the Mauchly test. Since in ANOVA when  $p < 0.05$  it is assumed that there are differences, it was necessary to do the test of multiple comparisons of Bonferroni to see which pairs of indicators are different.

From the reading of table 8, it can be observed that the indicator that presents the highest average is Web Layout with 3.33 (SD=1.02), followed by Pragmatic User Experience with 3.28 (SD=1.09), Purchase Intension with 3.07 (SD=1.15) and User Experience with 3.01 (SD=1.01). Hedonic User Experience is the indicator which presents the lowest average and below the midpoint of the scale, namely 2.74 (SD=1.06).

These results reveal that there are significant differences between the 5 indicators ( $F(4, 840) = 37.698$ ;  $p < 0.001$ ) with the valuation of Web Layout and Pragmatic User Experience being significantly higher than those expressed by the participants regarding Purchase Intention, User Experience and Hedonic user experience. Purchase Intention and User Experience were also significantly more valued than Hedonic user experience. As a result, Hypothesis 3 is confirmed, insofar as Pragmatic User Experience was significantly more valued than Hedonic user Experience.

	Mean	Std. Deviation	F	
1. Web Layout	3,33 <sup>123</sup>	1,02	37,698	<0,001
<b>2. Pragmatic User Experience</b>	3,28 <sup>456</sup>	1,09		
3. User Experience	3,01 <sup>147</sup>	1,01		
<b>4. Hedonic user Experience</b>	2,74 <sup>2578</sup>	1,06		
5. Purchase Intention	3,07 <sup>368</sup>	1,15		

Same numbers indicate significant differences  $p < 0,001$ <sup>124578</sup>  $p = 0,006$ <sup>3</sup>  $p = 0,002$ <sup>6</sup>

*Table 8 - Indicators descriptions*

The results presented in Table 9 and Figure 11 show that, in general, for all indicators, the averages are higher in the new than in the real indicators. In fact, the average of new is significantly higher than real for Web Layout ( $t(209) = -5.575$ ;  $p < 0.001$ ) and Pragmatic User

Experience ( $t(209) = -5.138$ ;  $p < 0.001$ ), with the differences in these indicators being around 0.7 points.

The average of new is also significantly higher than real in Purchase Intention ( $t(209) = -2.697$ ;  $p < 0.001$ ) and User Experience ( $t(209) = -3.327$ ;  $p < 0.001$ ), with the differences in these indicators being around 0.4 points.

Hedonic User Experience is the only indicator in which no significant differences are observed between Real and New ( $t(209) = -1.206$ ;  $p = 0.229$ ).

	Condition	N	Mean	Std. Deviation	t	p
Web Layout	Real	105	2,96	0,97	-5,575	<,001
	New	106	<b>3,69</b>	0,93		
Pragmatic user Experience	Real	105	2,91	1,06	-5,138	<,001
	New	106	<b>3,64</b>	1,01		
Hedonic user Experience	Real	105	2,66	1,07	-1,206	0,229
	New	106	<b>2,83</b>	1,05		
Purchase Intention	Real	105	2,85	1,10	-2,697	0,008
	New	106	<b>3,27</b>	1,16		
User Experience	Real	105	2,78	1,01	-3,327	0,001
	New	106	<b>3,24</b>	0,96		

Table 9 - Descriptive indicators by real and new

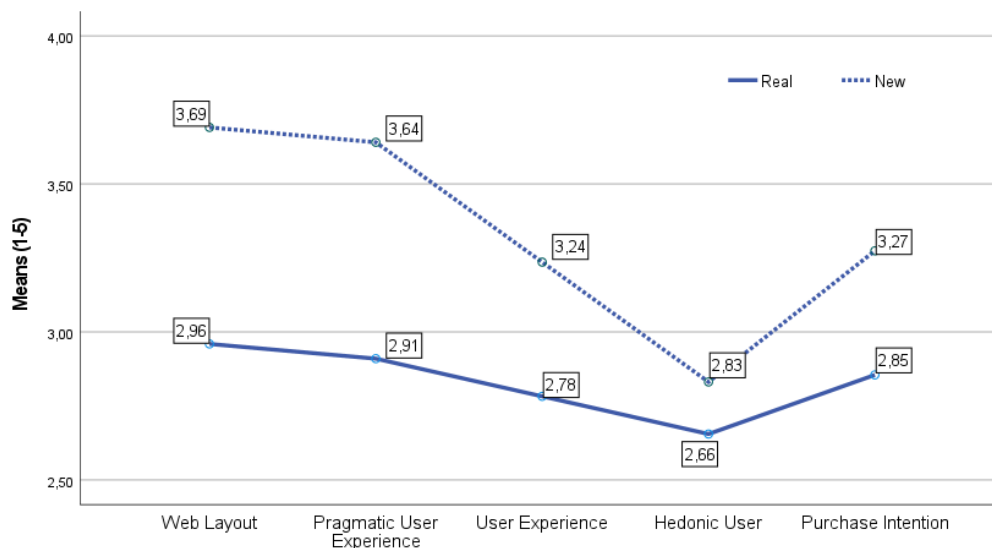


Figure 11 - Real and New websites indicators

## 4.5 Discussion

Based on the results described above we can verify that all the hypotheses were successfully confirmed and in accordance with the Literature.

Firstly, we can prove that after making changes to the design of Pingo Doce and Continente websites, online supermarket consumers are, in general, more intent on buying. Therefore, we can conclude that, as explained in the literature, including in the first section of the homepage elements such as payment methods, product price demonstration, visible side menu, on the left, and having an organization by categories is favorable not only for the consumer but also for the retailer.

To this extent, hypothesis 2 was also confirmed, since through the process model - mediation it can be verified that user experience, as a set of pragmatic and hedonic influences the relationship between web design and purchase intention.

Finally, as predicted by the literature, also the pragmatic aspect of user experience has more impact on consumer purchase intention than the hedonic aspects. With these results, we can understand that when developing webpages, the focus should be more on practical aspects than on emotional aspects (like "fun" or "enjoyable" perceptions). So, to increase the purchase intention and consequently the sales, retailers should therefore apply efforts to make such changes, since the applied improvements make such a difference.

## CHAPTER 5: CONCLUSIONS AND LIMITATIONS

The main findings and insights from the study will be covered in this final chapter, along with the management and academic implications of the findings and some limitations and ideas for future research.

### 5.1 Main Findings & Conclusions

#### ***RQ1: What is the most efficient layout for a retail food company to increase purchase intention?***

As we could verify by the analysis, a site that presents a better organization, with a better display of products, a greater exposed selection of them and finally, a good communication through signs and icons is considered to contain a better web layout than one that, on the contrary, does not present these characteristics.

In the linear regression, the ANOVA test is what tells us if the regression model is valid, if PI varies as a function of WD. If  $p < 0.05$  it is because it varies and the model is valid.  $R^2$  tells us how much of the variance in people's IP varies because of WD. Therefore, we find that 25% of people's PI varies because of WD.

Redundantly, we validate the magnitude of the impact of WD on PI, i.e. the B coefficient, by using the T-test. As  $p < 0.05$  has a significant impact, which is positive.

For every one-unit improvement in WD, people's PI increases by 0.562 (coefficient B).

In other words, Web Layout is found to be a significant predictor of Purchase Intention having a positive impact on it. ( $B=0.562$ ;  $t=8.342$ ;  $p < 0.001$ ).

Also, the consumer's purchase intention increases when the web design indicator also increases. Per increasing unit of web design quality, the purchase intention impacts an increase of 0.562 units with the emergent correlation being positive, significant and of moderate intensity ( $R=0.500$ ;  $p < 0.001$ ).

#### ***RQ2: What are the elements that drive user experience in a retail food website?***

Through the previous research and the literature review, aspects such as pragmatic and hedonic are those with the greatest impact on user experience. As we have seen, the pragmatic aspect can also be calculated through two components, usability and usefulness, which refer to a more practical context and which test the perception of graphic elements between the consumer and

the interface. On the other hand, the hedonic aspect refers to a more emotional context, analyzing the experience according to the psychological character of each consumer.

According to the literature, pragmatic aspects were also expected to have more impact on user experience than hedonic aspects. In this context, in the veracity analysis of H2, the test results showed that the Pragmatic indicator presents mean values of 3.28 (SD=1.09) while the Hedonic indicator presents the lowest mean value of all, namely 2.74 (SD=1.06).

In this context, throughout the study, we could also verify the mediating effect that user experience has between web design and consumers' purchase intention.

Throughout this study, we could also verify the mediating effect that user experience has between web design and consumers' purchase intention, assuming via the mediator user experience the impact on Purchase Intention of  $B=0.6189$ ; CI 95% [0.4987;0.7418]).

## **5.2 Managerial / Academic Implications**

In a managerial point of view, this study offers findings and conclusions that are of extreme importance in the era, not only to keep up with the market but to own the most effective website and consequently improve the consumer experience leading to higher purchase intent.

Firstly, in this days, the major retail grocery businesses have an e-commerce component to their website, which allows customers to purchase products online. This could be especially useful during the COVID-19 pandemic, as many people were looking for ways to shop safely and avoid crowds. Retail grocery websites also provide customers with important information about products, such as ingredients, nutrition facts, and price and this help customers make informed decisions when shopping. Websites also allow customers to place orders for pickup or delivery what are especially convenient for customers who are unable to visit the store in person, or who prefer the convenience of having their groceries delivered. Retail grocery websites can also offer customer loyalty programs, which can encourage customers to return to the store and make purchases. Retailers can still use these websites as an important marketing and branding tool. They can showcase the store's products, values, and mission, and help build a strong and positive reputation for the business.

Overall, retail grocery websites can be an important part of a business's operations and customer experience, providing customers with convenient and easy access to products and information, and helping businesses reach new customers and drive sales. For all this reasons, this study is important and can help retailers to focus on specific aspects of change that can improve a lot

their purchase intention as was demonstrated by comparing the stimuli from the real and new Continente and Pingo Doce websites.

In addition to the implications described above, this study also has academic implications that should be highlighted. Understanding the impact of web layout on consumer behavior: By studying the relationship between web layout and purchase intention in the context of two Portuguese supermarkets, the study could provide valuable insights into what is the best web layout and how this can influence intention to purchase in the retail grocery industry. This could be of interest to researchers and practitioners working in the fields of marketing, and e-commerce. Then, identifying best practices for web design in the retail grocery industry: The findings of the study could also be used to identify best practices for web design in the retail grocery industry, helping businesses to create more effective and user-friendly websites that can drive sales and customer loyalty.

The study could also contribute to the broader field of e-commerce research by providing new insights into the role of web design in driving online sales in the retail grocery industry.

Overall, the academic implications of this study could be significant, providing valuable insights into how web layout can impact intention to purchase in the retail grocery industry and helping to advance the fields of marketing, consumer behavior, and e-commerce research.

### **5.3 Limitations and Further Research**

Due to academic propose this research has some limitations that should be taken in consideration for future research.

Firstly, the major limitation is on budget or time frame that may prevent researchers from collecting data from a large sample of participants. This can lead to a lack of statistical power, making it more difficult to detect significant differences or trends in the data. For these conditions, can also be noticed a limitation of the scope of the study since there was a focus on a smaller number of variables or a specific geographic region which could limit the generalizability of the findings.

Also, these constrains limit the quality of the data collected. Using more expensive or time-consuming methods, to collect data, such as in-depth interviews or field observations can lead to more feasible results. However, using convenience technique may result in a sample bias.

In more detail, this questionnaire was exclusively distributed through LinkedIn, Facebook, Instagram and WhatsApp. There is a clear female predominance between the respondents representing 74,4% of the sample. Then, more than half of the sample (61,6%) was aged between 18 and 24 years old being the large majority students (bachelor and master's degree) and Portuguese (93,4%).

Secondly, the study used only two online supermarkets as a reference, Continente and Pingo Doce what makes it difficult to draw conclusions regarding the overall influence of web design on purchasing intention. Therefore, it would be interesting to include more retailers' websites in future studies to broaden the scope of the research and establish whether there is an impact on the relationship between web design and purchase intention.

Lastly, this study focused on the short-term effects, considering that the image of the site was captured according to the layout of the site on 22/10/2022 at 16:01, not undergoing changes throughout the distribution of the questionnaire.

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# APPENDICES

## Appendix 1 - Questionnaire

Have you ever done your supermarket shopping online?

- Yes
- No

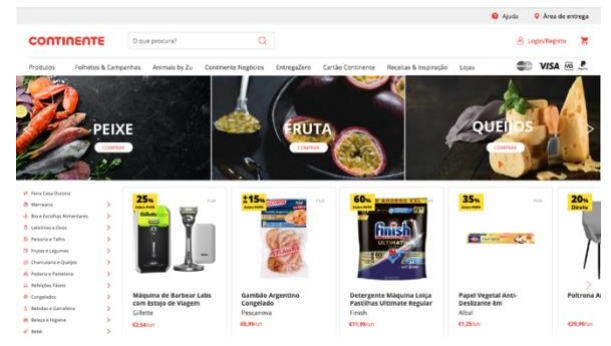
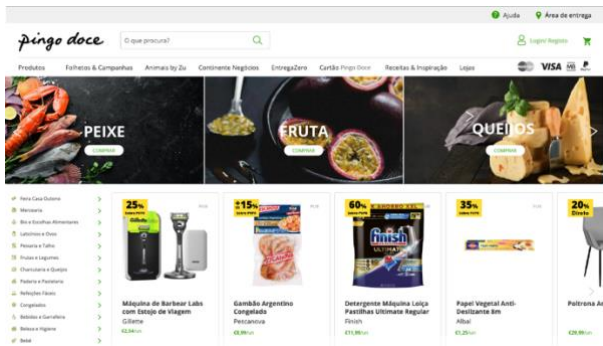
How often do you do your supermarket shopping online?

- 1 a month
- 2-3 a month
- +4 a month

Imagine that you are doing your online grocery shopping. Please analyze the website in such aspects:

- 1.Product displays
- 2.List of categories,
- 3.Product prices and promotions
- 4.Payment options

(Randomizer one of the images)



When presenting this image of the supermarket homepage, **how do you perceive this layout?**

<b>Unorganized</b>	○ ○ ○ ○ ○	<b>Organized</b>
<b>Bad product displays</b>	○ ○ ○ ○ ○	<b>Good product displays</b>
<b>Limited selection</b>	○ ○ ○ ○ ○	<b>Large selection</b>
<b>Unhelpful signs</b>	○ ○ ○ ○ ○	<b>Helpful signs</b>

Please identify to what extent do you agree with the following statements, on a 5-point Likert scale from **Strongly disagree (1) and Strongly agree (5)**

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
This website would help me to <b>purchase</b> products <b>faster</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This website would <b>improve my performance</b> in purchasing products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This website <b>would increase my productivity</b> in purchasing products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This website <b>would increase my effectiveness</b> in purchasing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please identify to what extent do you agree with the following statements, on a 5-point Likert scale from **Strongly disagree (1) and Strongly agree (5)**

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
<b>Shopping via this website would be easy</b> to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shopping on this website would be <b>clear and understandable</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It would be <b>easy to me to get what I need</b> from this website	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please identify to what extent do you agree with the following statements, on a 5-point Likert scale from **Strongly disagree (1) and Strongly agree (5)**

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
Shopping on this website would be <b>fun</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shopping on this website would be <b>exciting</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shopping on this website would be <b>delightful</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shopping on this website would be <b>thrilling</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shopping on this website would be <b>enjoyable</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please identify to what extent do you agree with the following statements, on a 5-point Likert scale from **Strongly disagree (1) and Strongly agree (5)**

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
If I need the product, I <b>would intend to purchase</b> on this website in the near future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I need a product, I <b>would be very likely to purchase</b> on this website in the near future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I need a product, I <b>would plan to purchase</b> on this website in the near future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I need the product, I <b>would consider purchasing</b> on this website in the near future	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q14

**Gender**

- Male
- Female
- Other

**What is your nationality?**

- Portuguese
- German
- Italian
- Brazilian
- Other

**Education level**

- High school diploma
- Bachelor's degree
- Master's degree
- Ph.D degree

**How old are you?**

- Under 18
- 18-24 years old
- 25-34 years old
- 35-44 years old
- 45-54 years old
- 55-64 years old
- 65+ years old

## Appendix 2 - Internal Consistency

### Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
R-C2_1 Unorganized- Organized	9,89	9,006	,722	,770
R-C2_2 Bad product displays - Good product displays	9,92	9,060	,745	,760
R-C2_3 Limited selection - Large selection	10,15	9,715	,555	,847
R-C2_4 Unhelpful signs: Helpful signs	9,84	9,918	,669	,795

### Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
R-C2_1 Unorganized- Organized	9,89	9,006	,722	,770
R-C2_2 Bad product displays - Good product displays	9,92	9,060	,745	,760
R-C2_3 Limited selection - Large selection	10,15	9,715	,555	,847
R-C2_4 Unhelpful signs: Helpful signs	9,84	9,918	,669	,795

### Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
R-C5_1 Shopping on this website would be fun	10,98	18,331	,839	,940
R-C5_2 Shopping on this website would be exciting	11,03	18,210	,876	,933
R-C5_3 Shopping on this website would be delightful	11,06	17,896	,901	,928
R-C5_4 Shopping on this website would be thrilling	11,17	18,644	,841	,939
R-C5_5 Shopping on this website would be enjoyable	10,82	18,229	,834	,941

### Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
R-C6_1 If I need the product, I would intend to purchase on this website in the near future	9,16	11,697	,903	,920
R-C6_2 If I need a product, I would be very likely to purchase on this website in the near future	9,19	11,591	,902	,920
R-C6_3 If I need a product, I would plan to purchase on this website in the near future	9,27	11,452	,905	,919
R-C6_4 If I need the product, I would consider purchasing on this website in the near future	8,97	11,875	,780	,959

### Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
R-C3_1 This website would help me to purchase products faster	32,86	128,282	,833	,964
R-C3_2 This website would improve my performance in purchasing products	32,89	128,678	,827	,965
R-C3_3 This website would increase my productivity in purchasing products	32,76	126,813	,879	,963
R-C3_4 This website would increase my effectiveness in purchasing	32,82	128,857	,860	,964
R-C4_1 Shopping via this website would be easy to me	32,52	128,817	,821	,965
R-C4_2 Shopping on this website would be clear and understandable	32,67	128,893	,846	,964
R-C4_3 It would be easy to me to get what I need from this website	32,64	128,745	,833	,964
R-C5_1 Shopping on this website would be fun	33,12	131,241	,770	,966
R-C5_2 Shopping on this website would be exciting	33,13	131,062	,797	,965
R-C5_3 Shopping on this website would be delightful	33,22	129,447	,846	,964
R-C5_4 Shopping on this website would be thrilling	33,27	131,556	,775	,966
R-C5_5 Shopping on this website would be enjoyable	33,01	128,757	,861	,964

### Appendix 3 -Distribution of indicators

Normality and homogeneity of variances

	Stimuli	Tests of Normality				Levene teste for Homogeneity of variance				
		Kolmogorov-Smirnov <sup>a</sup>			Skewnes s	Kurtose	Statisti c	df1	df2	Sig.
		Statisti c	df	Sig.						
Web Layout	RC - Real Continente	,137	52	,016	-,006	-1,059	,834	3, 207	,477	
	RP - Real Pingo Doce	,154	53	,003	-,502	-,337				
	NC - New Continente	,084	52	,200*	-,248	-,617				
	NP - New Pingo Doce	,107	54	,184	-,732	,556				
Pragmatic User Experience	RC - Real Continente	,183	52	<,001	,245	-1,016	,879	3, 207	,453	
	RP - Real Pingo Doce	,131	53	,024	-,199	-,495				
	NC - New Continente	,092	52	,200*	-,542	-,185				
	NP - New Pingo Doce	,115	54	,074	-,559	-,463				
Hedonic user Experience	RC - Real Continente	,175	52	<,001	,235	-,960	,866	3, 207	,460	
	RP - Real Pingo Doce	,112	53	,097	,230	-,386				
	NC - New Continente	,086	52	,200*	,010	-,378				
	NP - New Pingo Doce	,119	54	,055	-,006	-,284				
Purchase Intention	RC - Real Continente	,133	52	,023	,076	-1,013	2,155	3, 207	,094	
	RP - Real Pingo Doce	,135	53	,017	-,150	-1,167				
	NC - New Continente	,131	52	,026	-,329	-1,108				
	NP - New Pingo Doce	,107	54	,188	-,307	-,701				
User Experience	RC - Real Continente	,189	52	<,001	,253	-,993	1,832	3, 207	,143	
	RP - Real Pingo Doce	,089	53	,200*	-,032	-,322				
	NC - New Continente	,104	52	,200*	-,349	-,360				
	NP - New Pingo Doce	,088	54	,200*	-,349	-,358				

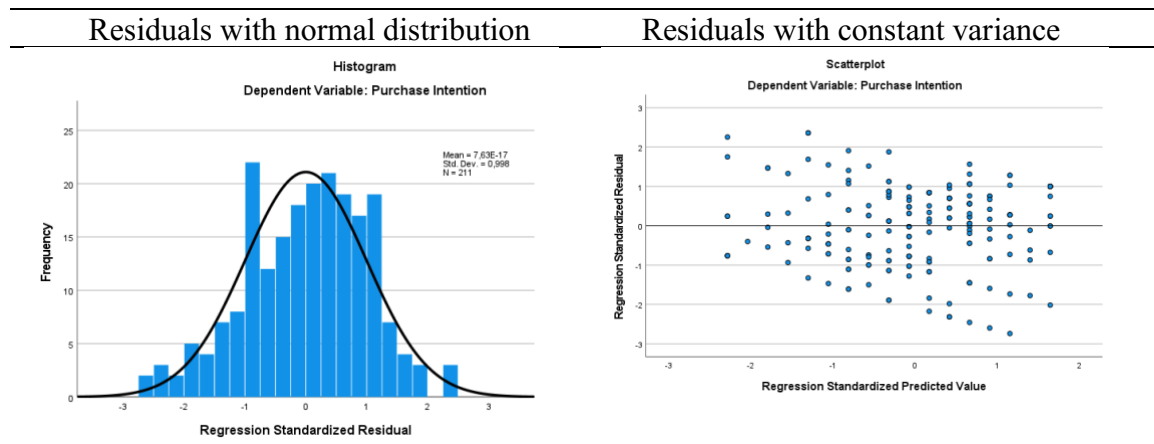
\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

## Appendix 4 - H1: Validation of Simple Linear Regression of Assumption

Linear Relationship Web Design \* Purchase Intention - Figure 8

Residuals independence: Durbin-Watson  $[2 \pm 0,5] = 2,014$



## Appendix 5 - H3: Mauchly's Test of Sphericity

### Mauchly's Test of Sphericity<sup>a</sup>

Measure: MEASURE\_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon <sup>b</sup>		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
factor1	,000		9		,651	,660	,250

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. Design: Intercept

Within Subjects Design: factor1

b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

### Tests of Within-Subjects Effects

Measure: MEASURE\_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>a</sup>
factor1	Sphericity Assumed	45,989	4	11,497	37,698	<,001	,152	150,792	1,000
	Greenhouse-Geisser	45,989	2,606	17,648	37,698	<,001	,152	98,235	1,000
	Huynh-Feldt	45,989	2,641	17,410	37,698	<,001	,152	99,579	1,000
	Lower-bound	45,989	1,000	45,989	37,698	<,001	,152	37,698	1,000
Error(factor1)	Sphericity Assumed	256,184	840	,305					
	Greenhouse-Geisser	256,184	547,223	,468					
	Huynh-Feldt	256,184	554,712	,462					
	Lower-bound	256,184	210,000	1,220					

a. Computed using alpha = ,05

**Pairwise Comparisons**

Measure: MEASURE\_1

(I) factor1	(J) factor1	Mean Difference (I-J)	Std. Error	Sig. <sup>b</sup>	95% Confidence Interval for Difference <sup>b</sup>	
					Lower Bound	Upper Bound
1	2	,050	,057	1,000	-,113	,213
	3	,317*	,057	<,001	,156	,478
	4	,583*	,066	<,001	,395	,772
	5	,262*	,075	,006	,049	,474
2	1	-,050	,057	1,000	-,213	,113
	3	,267*	,025	<,001	,195	,338
	4	,533*	,050	<,001	,391	,676
	5	,212*	,055	,002	,055	,368
3	1	-,317*	,057	<,001	-,478	-,156
	2	-,267*	,025	<,001	-,338	-,195
	4	,267*	,025	<,001	,195	,338
	5	-,055	,049	1,000	-,195	,085
4	1	-,583*	,066	<,001	-,772	-,395
	2	-,533*	,050	<,001	-,676	-,391
	3	-,267*	,025	<,001	-,338	-,195
	5	-,322*	,056	<,001	-,480	-,164
5	1	-,262*	,075	,006	-,474	-,049
	2	-,212*	,055	,002	-,368	-,055
	3	,055	,049	1,000	-,085	,195
	4	,322*	,056	<,001	,164	,480

Based on estimated marginal means

\*. The mean difference is significant at the ,05 level.

b. Adjustment for multiple comparisons: Bonferroni.