**DBA PROPOSAL**

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DBA PROPOSAL

1. **Introduction**

The topic that will be studied in this article is the online customer experience and how an improvement in this user's experience can benefit companies' results. Internet shopping grows exponentially. In this way, companies of all types, whether retail or services, understood the need to be concerned with their customer's experience in digital environments. The pandemic has made that reality even more urgent. The customer experience is now not just limited to our physical experience, but digital as well.

Several authors have been studying the main elements that interfere in the online customer experience. In an article published by Bleir, Harmeling and Palmatier (2019) for the renowned Journal of Marketing magazine, the authors proved that design elements interfere in the online customer experience. Another article published by Huang and Cappel (2012) analyzed the interference of usability elements extracted from the US government report release in 2006 (US HHS/GSA, 2006) on the success of companies listed in the INC 500. Websites that make extensive use of usability elements tend to be more successful as a business.

The purpose of this study which comprises the future publication of three scientific articles, therefore, is to understand the impacts of design (Zhu and Zhang 2010) and usability (US.HHS/GSA, 2006) elements on the dimensions of the online customer experience: informativeness/Cognitive (Gentile, Spiller and Noci 2007), entertainment/affective (Babin, Darden and Griffin 1994), Social presence (Wang at al. 2007) and Sensory (Gentili, Spiller and Noci 2007).

Bleir, Harmeling and Palamtier (2019) were brilliant in analyzing and proving the impact of design elements on the customer's online experience. Through qualitative and quantitative research they were able to prove that all design elements (verbal, visual and mix elements) impact the customer's online experience. However, some theorists say (Cappel & Zhenyu, 2012) that in addition to design elements, there are other factors that interfere with the customer's online experience. The most cited by doctrine are the usability elements (US.HHS / GSA, 2006). According to Zhenyu Huang and James J. Cappel (2012), usability interferes in the online customer experience and also in the performance of the company as a whole. According to Lemon and Verhoef (2016), customer experience, in general, comprises a behavioral dimension. When we talk about the customer's online experience, this behavioral character cited by Lemon and Verhoef (2016) alludes to the elements of website use combined with design elements. This is the gap that this research wants to contribute to the academic community. It is intended to jointly analyze the usability and design elements in the online customer experience. Until now, the design elements and the elements of use were formed in an integrated way. It was concluded that both the design and the usability elements significantly interfere in the customer's online experience. Therefore, what we will test is whether a combination of both elements (design and usability) will interfere with the online customer experience in the same way that has been proven in isolation in previous articles. Therefore, our main hypothesis is: that the design elements and specifications together will impact equally or more than if used in isolation.

In the first article, the main objective is to analyze the impact of seven usability elements (Zhenyu & Cappel, 2012) combined with design elements (Bleier; Harmeling; Palmatier, 2019) to test their impact on the online customer experience. For this purpose, it is intended to build eight different websites, combining the usability elements in a structured way in each one of them. To define the structure of these websites in relation to the usability elements, we use the method of Tagushi (1986) which will be explained in the chapter on research methodology. To carry out the survey, we will interview people who will be exposed to these eight experiments at random in order to understand their perceptions regarding the elements of the online customer experience (Lemmon and Verhorf, 2016)

The second research will be an A / B test in order to understand which of the usability elements significantly interfere in customer engagement. We will direct Facebook ads to all pages in a hedonic and analogous manner. And let's look at which pages the customer has the greatest behavioral interaction (Lemon and Verhoef, 2016). Based on this study, we will be able to understand which of the usability elements applied together with the design elements interfere in the customer's engagement with the page in a consistent way.

And, after both studies, we will develop a conclusive research, analyzing the results of the first and second study and giving our academic contribution so that other scholars can continue the proposed line of research. Thus, the third study will be a thorough and conclusive analysis of previous research.

1. **Research question:**

Do elements usability, when used in combination of design elements, interfere with the online customer experience?

1. **Theorical References:** 
   1. **Dimensions of the online Customer Experience.**

As compared with brick-and-mortar retail, in an online system customer assess products through verbal (information) and visual stimuli (pictures and videos) not through physical interaction (Bleier, 2018). There are a huge number of research studies on offline experiences that are based on multiple, different, and linked dimensions including cognitive, sensory, affective, physical, and social (Brakus, Schmitt, & Zarantonello 2009; Lemon and Verhoef, 2016; Schmitt, 1999; Verhoef et al. 2009). On the other hand, the online research studies were mainly based simplistically because limited information was available through online sources (Novak, Hoffman, and Yung 2000; Steenkamp and Geyskens 2006).

Simply, previous research studies were based on the simple mechanism as compared with physical interaction research studies on customer experiences. According to Anderson (1985) & Pinker (1977), four basic systems of the human mind are known as cognition, affection, sensations, and relationships. So, in this research study, we conceptualize the online customer experiences based on four dimensions including informativeness/Cognitive (Gentile, Spiller, and Noci 2007), entertainment/affective (Babin, Darden, and Griffin 1994), sensory (Gentile, Spiller, and Noci 2007, and social presence (Wang et al. 2007). In simple words, the research study will be based on these four dimensions that are important to understand and evaluate the customer online experiences for purchasing products and services.

Lim and Ting (2012), defined dimensions of online customer experience as “the extent to which a website provides consumers with resourceful and helpful information.” As for the cognitive appeal that we conceptualize as informativeness, it is defined as the “primary cognitive dimension” in online customer experience. According to Gentile et al. (2007), the informativeness dimension consisted of website contribution in providing the customer help in deciding on purchasing specific product by following a process that including thinking, conscious mental processing, and solution oriented. Such kind of information is very important because such fact base information can improve the attitude of customers towards websites or web pages (Hausman and Siekpe 2009; Hsieh et al. 2014). In the same way, the interactions of the customer with products available on the website can evoke an affective domain that forces functional considerations regarding the products.

As the affective appeal is linked with the entertainment dimension of the online customer experience. In simple words, entertainment or we can say that immediate pleasure of online experience regardless of purchasing behavior is the key dimension in online customer experience and online purchasing (Babin, Darden, and Griffin 1994). According to Kukar Kinney (2010), the entertainment dimension is there to trigger arousal in online customer experience by turning a visitor into a customer and reduce the chances of putting the product into the card box. In simple words, we can say that the entertainment dimension is there to enhance to customer online experience on one side and increase the sales of the seller on the other side. However, the lack of physical availability of products cannot provide such benefits on online shopping.

However, to match with the offline experience, the seller put effort into making a good social presence of products and services. In other words, the seller tends to show an attractive dimension of their products to visitors to make the social presence of their product in the online market (Wang et al. 2007). Gefen & Straub defined the social presence of a product as “it refers to the warmth, sociability, and feeling of human contact that web site confers (2003).” The social presence of a product or website is very important because it can increase the perceived tangibility and increased the feeling of closeness of customers to the products (Darke et al. 2016). Furthermore, the dimension of the social presence of a website can also increase the flow in online shopping and purchasing behavior of customers as well (Cyr et al. 2007).

The last but not least, the sensory dimension of customer experience may include aspects like sound, sight, taste, smell, and touch (Gentile, Spiller, and Noci 2007). There are many scholars like Zajonc (1980) that argued that this dimension of sensory appeal happened automatically and mainly it derived preference on product selection and purchasing. According to Steuer (1992) sensory appeal in an online environment is “the representational richness of a mediated environment as defined by its formal features (p.81).” It is also the fact that in online entertainment it is quite different to obtain all the scope of sensory experience, but the sensory appeal can be increased by using imagery domain like pictures and videos (Elder et al. 2017).

The product website is believed to be the heart of the online customer experience. It is mainly based on verbal stimuli and visual stimuli that are necessary elements for the construction of any web page. In this study, our focus was on the interference of usability and design elements in the online customer experience. We intend to test which usability elements most interfere with the dimensions of the online customer experience described above. In order to measure the impact of usability elements in the dimensions informativeness, entertainement, Social presence and sensory component, a questionnaire was developed to carry out the research (Annex I). This questionnaire was the same one used by Bleier, Harmeling and Palmatier (2019) in their article on the impact of design elements on the online customer experience.

* 1. **Webpage Design Elements**

Verbal Elements

Verbal elements are based on a written word or we can say that verbal elements are based on the text regarding the product. Further, the verbal elements may consist of the linguistic style of the text, descriptive details regarding the product, the number of bulleted features, and most importantly it consists of the return policy of the product (Bleier et al. 2018). The linguistics style of the verbal elements consists of word choice, use of questions, pronouns, etc.—that are used to enhance the product conversions and increase the consumer trust on the website (Ludwig et al. 2013; Song & Zinkhan, 2018). Song & Zinkhan (2018) argued that there is preliminary evidence that linguistic style put a great impact on the social presence of the product. Furthermore, by providing more attributed information regarding a product we can enhance the evaluation of the product and can increase the consumer buying behavior (Cooke et al. 2002; Hauser et al. 2009). In the same way, using the number of bulleted features is very important to increase the website's effectiveness and product sales. It is because when a feature of the product is listed on the top of the website/webpage regarding the product, it provides an opportunity for the visitor to understand and imagine the product which in turn the visitor into a buyer. Furthermore, the return policy is a very precious element in the online customer experience. It is because it is directly linked with the web page effectiveness, as buyers are always concerned about the money so it is important to provide important information regarding the return policy of the product so the buyer can easily decide to purchase the product.

Visual elements

According to Scott (1994), visual elements consisted of all content that is presented in a photographic form which is mainly used to convey the symbolic meaning of the product. Visual elements can also divide into further like feature crops, lifestyle photos, size, and videos regarding the product. Feature crops are important because it zooms in or highlights a key product feature which is not visible in the picture of the product. In the same way, lifestyle photo provides the customer with the imagination power to live with the product in a regular setting. It means that this feature provides a product picture while using it in a real-life setting that can enhance the customer's attention towards the product. According to Lennon & Stoel (2005), the image of the product in larger size increased the purchase attention of the visitor. In the last, the video regarding the product to illustrate the key feature and other benefits of the product and its way of use can enhance the attention of the customer as well as the purchasing attention of the customer.

Mixed elements: Verbal/Visual Elements

Customer star ratings, comparison matrices, expert endorsements, recommendation agents, and content filters all are together known as verbal and visual elements of the mixed method. Customer star ratings are generated by the customer to let other customers known about the product usage and seller behavior (Chevalier & Mayzlin, 2006). Expert endorsement is something to include experts of the field to provide product evaluation based on their expertise and experience (Ansari et al. 2000). Comparison matrices are the facility provide by the web pages in which a focal product is compared with another same kind of product to provide the customer with an in-depth understand and differences among them. In the last, the recommendation combines both verbal and visual information of the product to generate the alternatives feature of the focal product (Lamberton and Stephen 2016). In general, it is very important to understand the elements of online customer experience as well as the usability of the website to completely evaluate the online customer experience.

* 1. **Websites usability Elements:**

The usability measure of the website is very important because it gives the user with freedom and facility that they may need while exploring the website (U.S/HHS/GSA, 2006). The site search capability of any website is the facility in which the website allows its visitors/users to search specific content or product within the entire website.

Escolhemos os elementos que iremos usar nesta pesquisa no site do U.S/HHS/GSA, 2006, este guia foi desenvolvido pelo departamento de saúde e serviços dos EUA (HHS). Eles estabeleceram várias diretrizes baseadas em pesquisas de usabilidade do usuário para orientar profissionais da internet a criar web sites responsivos e fáces de usar para o público. Desde sua introdução em 2003, as Diretrizes têm sido amplamente utilizadas por agências governamentais e do setor privado por isso escolheu-se esse guia como referencia de elementos de usabilidade neste projeto.

O documento desenvolvido pelo HHS possui 18 vertentes da usabilidade do usuário o que marca os capítulos do documento. Dentro dessas vertentes temos 209 elementos de usabilidade. Se fossemos testar todos eles a pesquisa aqui apresentada ficaria inviável portanto fizemos a seleção de apenas 7 elementos, que são os mais importantes, conforme estabelecido pelos critérios a seguir.

O próprio guia de design e usabilidade do usuário (U.S HHS/ GSA, 2006) classifica os elementos de usabilidade de 1 a 5 em dois critérios: importância relativa e força da evidência. A importância relativa foi definida por especialistas da área de design e usabilidade, sendo a nota 5 dada para aqueles critérios que tem maior importância na usabilidade do usuário em comparação com os demais.

E a força da evidência é se realmente existe provas de que tais critérios são realmente relevantes e fáceis de serem identificados na página. O critério usado para determinar a força evidência esta descrito abaixo (U.S HHS/ GSA, 2006, p. 24)

5 – Strong Research Support

• Cumulative and compelling, supporting research-based evidence

• At least one formal, rigorous study with contextual validity

• No known conflicting research-based findings

• Expert opinion agrees with the research

4 – Moderate Research Support

• Cumulative research-based evidence

• There may or may not be conflicting research-based findings

• Expert opinion

• Tends to agree with the research, and

• A consensus seems to be building

3 – Weak Research Support

• Limited research-based evidence

• Conflicting research-based findings may exist

- and/or -

• There is mixed agreement of expert opinions

2 – Strong Expert Opinion Support

• No research-based evidence

• Experts tend to agree, although there may not be a consensus

• Multiple supporting expert opinions in textbooks, style guides, etc.

• Generally accepted as a ’best practice’ or reflects ’state of practice’

1 – Weak Expert Opinion Support

• No research-based evidence

• Limited or conflicting expert opinion

Portanto, utilizamos como critério de escolha dos elementos de usabilidade que iremos trabalhar neste estudo notas de importância relativa igual a 5, portanto somente entrará em análise elementos que tem importância máxima em comparação com os elementos elencados pelo guia de usabilidade. E força de evidência igual ou maior que 4.

Dessa forma, de maneira objetiva, escolhemos apenas os elementos mais importantes em comparação aos demais e com evidências acadêmicas relevantes tanto para análise quanto para determinar o objeto no website. Depois de filtrarmos os critérios apresentados, chegamos em apenas 10 elementos de usabilidade e design: Provide useful contente, estabilish user requirements, standardize task sequences, create a positive first impression on your site, place importante items consistently, Place important itens at top center, eliminate horizontal scrolling, use clear category labels, use meaningful link labels, make action sequences clear, organization information clearly, ensure that necessary information is displayed.

Segue abaixo um pequeno resumo do que significa cada um dos elementos que serão analisados neste estudo:

Diretriz: forneça conteúdo envolvente, relevante,

e apropriado para o público.

Comentários: o conteúdo é a informação fornecida em

Um website. Não desperdice recursos proporcionando fácil acesso e boa usabilidade para

o conteúdo errado. Um estudo descobriu que o conteúdo é o elemento mais crítico

de um site. Outros estudos relataram que o conteúdo é mais importante do que

navegação, design visual, funcionalidade e interatividade.

Under the identity feature of a website, there is a homepage browser title which is a very important feature that helps the user to remember and bookmark the web page on the browser list. In simple words, this feature ensures the return of the visitor because it distinguishes the website among hundreds of websites. Homepage company identifying information is precious information for any user. It consists of important information regarding the company and seller which should be visible and authentic because it leads a great impression of the visitor's mind regarding the website.

Almost every big company used its logo as a homepage link because psychologically users always click on the logo of the company to return to the homepage. In which feature the information should be put regarding the introduction of the company. Underlined text links, it is important to highlight the link address by underlining them, so that users can easily understand that it is a link to a specific webpage, so it will save the time of the user and direct user who are looking for specific kind of information. Furthermore, the color of the link address must need to be changed after visited by the user. Splash page, it a feature in which a small screen or window appears in front of the visitor that consists of introductory information and specific important information regarding updates about specific events or products (Nielsen, 2000).

**Table 1.** Usability and Web Design

|  |  |
| --- | --- |
| Usability Measure (U.S HHS/ GSA, 2006) | Webpage Design Elements (Bleier, Harmeling and Palmatier, 2019) |
| Navigational Aids:  Site search capability (1)  Breadcrumb trail (2) | Verbal Elements  Linguistic style  Descriptive product detail  Bulleted product features  Return policy information |
| Identity Features:  Homepage browser title (3)  Homepage company identifying information (4) | Visual Elements  Product feature crop  Lifestyle photo  Photo size  Product video |
| Use of Web Conventions:  Company logo as a “Home” link (5)  Underlined text links (6)  Text link color changes (7) | Verbal/Visual Elements  Content filter  Customer star ratings  Expert endorsement  Comparison matrix  Recommendation agent |
|  |  |

Table 1 above summarizes the usability and design elements that we will apply in our experiments. It is intended to test, through a series of experiments, which usability elements, which, combined with the design elements, most interfere in the online customer experience and in their engagement with the website.

Some researchers such as Bleier, Harmeling and Palmatier (2019), tested and proved that design elements are capable of significantly interfering with the online customer experience. However, nothing was said in the research regarding the usability elements.

Therefore, this work intends to be dedicated to testing this academic gap. It is intended to understand which usability elements (U.S HHS/GSA, 2006) most interfere in the online customer experience when combined with the design elements..

Below is Figure 1, which shows how the combination of all these elements can interfere with the online customer experience:

Figure 1

Diagrama

Descrição gerada automaticamente

And below is an illustration of the above elements spread out on a standard website, as will be worked in the experiment:

Figure 2

1. **Hypotheses**

As we can see in the literature review, several authors are analyzing the elements that can, in some way, interfere in the online customer experience. It was proven through the research of Bleier and Palmatier (2019) that all design elements (visual, verbal and mix) significantly interfere in the online customer experience.

However, it was not only the design elements that were the subject of research in this area. Huang and Cappel (2012) believe that usability elements (US.HHS / GSA, 2006) are present on the websites of the best companies in the world. That is, there is a high probability that these usage elements also significantly interfere with the online customer experience.

Therefore, what we want to test in this work is whether usage elements (US.HHS / GSA, 2006) combined with design elements (Bleier; Harmeling and Palmatier, 2019) interfere in the online customer experience in an equal or even more limited way. than was found in previous research when these elements were tested in isolation.

1. **Metodology:**

Como o estudo de Bleier (2019) já provou que existe uma correlação entre a aplicação dos elemento de design à melhor experiência do cliente online. Nossa missão aqui é combinar os elementos de design e testar se os elementos de usabilidade tem resultado semelhante. Não iremos testar os 11 elementos de usabilidade previsto no artigo x... Vamos utilizar apenas 7 elementos de usabilidade que são mais relevantes, segundo ... na experiência do cliente online. São eles: 1. Breadcrumb trail is provided. 2. Company identity is clear on home page, 3. Company logo serves as a “home” link , 4. Text links are underlined, 5. Text link color changes after it is clicked, 6. Site search label is clear, 7.The home page does not contain an active “home” link

Testar os efeitos de um número tão grande de elementos representa um desafio empírico considerável. Um projeto fatorial completo teria exigido a construção e análise de 128 sites diferentes (27). Com essa abordagem, poderíamos ter investigado todos os efeitos de interação potenciais entre os elementos de usabilidade, mas seria inviável de executar. Portanto, adotamos um projeto de matriz ortogonal de Taguchi (1986), que reduziu o número necessário de sites para 8 (conforme a figura x).

Um experimento Taguchi é um experimento planejado que permite escolher um produto ou processo que funcione mais consistentemente no ambiente experimental. Experiências Taguchi reconhecem que nem todos os fatores que causam variabilidade podem ser controlados. Esses fatores incontroláveis são chamados fatores de ruído. Os experimentos Taguchi tentam identificar fatores controláveis (fatores de controle) que minimizam o efeito dos fatores de ruído. Durante a experimentação, você manipula fatores de ruído para forçar a ocorrência de variabilidade e determinar configurações ideais de fatores de controle que tornem o processo ou produto robusto ou resistente a variações causadas por fatores de ruído. Um processo planejado com este objetivo irá produzir saída mais consistente. Um produto planejado com este objetivo irá fornecer um desempenho mais consistente independente do ambiente no qual ele é usado.

Experimentos de Taguchi usam matrizes ortogonais que estimam os efeitos dos fatores na média e variação da resposta. Uma matriz ortogonal significa que o experimento é balanceado de forma que os níveis de fatores são ponderados igualmente. Por esse motivo, cada fator pode ser avaliado independentemente de todos os outros fatores e o efeito de um fator não afeta a estimativa de outro fator. Isso pode reduzir o tempo e o custo associados ao experimento quando se usa experimentos fracionários.

A imagem 1 mostra o experimento de Taguchi L8 (27) Taguchi (matriz ortogonal). L8 significa 8 sites diferentes. 27 significa 7 elementos de usabilidade citados anteriormente com 2 níveis cada (presente e não presente). Se fosse usado o experimento fatorial completo, haveria 27 = 128 sites, tornando o experimento inviável de executar. A matriz L8 (27) requer apenas 8 sites - uma fração do experimento fatorial completo. Essa matriz é ortogonal; os níveis de fatores têm o mesmo peso em todo o experimento. As colunas da tabela representam os fatores de controle (elementos de usabilidade), as linhas da tabela representam os sites produzidos (combinações de níveis de fatores) e cada célula da tabela representa o nível de fator para o site.

Uma imagem contendo Texto

Descrição gerada automaticamente

Figura 1 (Tagushi, 1996)

Dessa forma, entendemos como nível 1 que o elemento de usabilidade está presente e o nível 2, que o elemento de usabilidade não está presente. A tabela 1 mostra de forma simplificada como serão desenvolvidos os websites de uma mesma empresa (estética prestadora de serviços de beleza) e os elementos que estarão presentes em cada um dos sites.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Breadcrumb trail | Company identify | Company logo serves as home | Text link are underlined | Text link color changes after it is clicked | Site search label is clear | The home page does not contain an active “home” link |
| Site 1 | Present | Present | Present | Present | Present | Present | Present |
| Site 2 | Present | Present | Present | Not present | Not present | Not present | Not present |
| Site 3 | Present | Not present | Not present | Present | Present | Not present | Not present |
| Site 4 | Present | Not present | Not present | Not present | Not present | Present | Present |
| Site 5 | Not present | Present | Not present | Present | Not present | Present | Not present |
| Site 6 | Not present | Present | Not present | Not present | Present | Not present | Present |
| Site 7 | Not present | Not present | Present | Present | Not present | Not present | Present |
| Site 8 | Not present | Not present | Present | Not present | Present | Present | Not present |

Tabela 1

Nosso objeto de estudo será uma clínica de estética, que tem várias lojas em todo o Brasil e que vende serviços de beleza para mulheres como bronzeamento artificial, procedimentos de emagrecimento, etc. O mockup do site e os elementos de design e usabilidade estarão presentes no site de acordo com a imagem x

Artigo 1:

The purpose of this articles are understand the impacts of design (Harmeling; Palamtier, 2019) and usability (US.HHS/GSA, 2006) elements on the dimensions of the online customer experience: infomativeness/Cognitive (Gentile, Spiller and Noci 2007), entertainment/affective (Babin, Darden and Griffin 1994), Social presence (Wang at al. 2007) and Sensory (Gentili, Spiller and Noci 2007).

Objetivo: O primeiro artigo tem por objetivo entender o impacto dos elementos de usabilidade combinados aos elementos de design na experiência do cliente online.

Espera-se, baseado no referencial teórico, que os elementos de usabilidade podem e vão interferir na experiência do cliente online.

Para testar esta primeira hipótese recrutaremos 160 interessados em serviços de uma clínica de estética, parceira do projeto, que serão expostos aos 8 sites criados. Esse número de experimentos foi baseado na matriz de Tagush exposta anteriormente no capítulo de metodologia. A definição da quantidade amostral se deu de acordo com o artigo... Portanto, o método utilizado na pesquisa do primeiro artigo tem caráter quantitativo. Os entrevistados serão mulheres entre 20 e 50 anos, brasileiras, uma vez que este é o público do objeto do nosso estudo. As mulheres serão escolhidas aleatoriamente. Os respondentes serão expostos aleatoriamente a uma das 8 células experimentais (sites), serão apresentados à página da web correspondente e instruídos a explorá-la por pelo menos 45 segundos. Em seguida, elas responderão a um questionário com perguntas demográficas, e itens para verificação de manipulação e realismo e escalas preexistentes para medir as intenções de compra e as quatro dimensões de experiência (ver Anexo I).

Espera-se que cada elemento da usabilidade interfira de forma significativa na experiência do cliente online.

Cronograma da pesquisa:

Outubro de 2021: Criação dos sites

Novembro de 2021 à Fevereiro de 2022: Desenvolvimento da pesquisa

Março de 2022 à Abril de 2022: Análise dos resultados

Maio de 2022 `a Julho de 2022: Finalização do artigo.

Artigo 2:

Objetivo: pretende-se em um segundo estudo explorar os impactos dos elementos de usabilidade combinados aos elementos de design no engajamento do usuário com a página.

Espera-se que os elementos de usabilidade interfiram de forma significativa no engajamento das páginas, e na possível conversão dos usuários do site.

Para testar nossa hipótese iremos utilizar uma abordagem quantitativa bastante conhecida: os testes A/B. Iremos expor as 8 páginas desenvolvidas anteriormente combinando os elementos de design com os de usabilidade. Lembrando que a justificativa da utilização das 8 páginas está baseada no método Tagushi (1996) explicado no capítulo de metodologia deste mesmo documento. Cada uma das oito páginas serão expostas de forma aleatória para 5 mil usuários. O experimento, portanto, terá uma exposição total de 40 mil usuários, justificados através..... O objetivo deste experimento é analisar se os elementos de usabilidade interferem no engajamento e conversão desses usuários. Para extrair o resultado dessa pesquisa utilizaremos ferramentas do Google de análise de dados, como o Google Analytcs. E para aumentar o tráfego qualificado às 8 páginas e conseguir uma amostragem satisfatória, iremos utilizar a ferramenta do Facebook de anúncios. Os anúncios irão rodar durante 1 mês e, de forma aleatória, irão direcionar usuários qualificados para as oito páginas criadas anteriormente. A partir daí, quando atingirmos a taxa de impressões de 5 mil visistantes por página, analisaremos o engajamento desses visitantes com as páginas através do Google analytcs.

Cronograma da pesquisa:

Julho 2022 à Agosto 2022: Rodar os anúncios e colher os dados

Agosto 2022 à Setembro de 2022: compilar os dados e desenvolver as conclusões

Outubro 2022 à Dezembro 2022: Finalizar o artigo

Artigo 3:

Objetivo: Compilar os resultados colhidos das pesquisas anteriores e fazer uma análise holística do impacto dos elementos de usabilidade na experiência e no engajamento do cliente online.

O resultado que esperamos com esta pesquisa é que os elementos de usabilidade são essenciais para experiência e o engajamento do cliente online.

Limitações do estudo:

As principais limitações do estudo apresentado nesta proposal é o uso de apenas um objeto de estudo, ou seja, um segmento de mercado, que será clínicas de estética brasileira. E o uso de apenas sete elementos de usabilidade no escopo do projeto, uma vez que existem mais de x elementos de usabilidade que podem ser usados em sites de todos os tipos. Espera-se que este estudo contribua com a comunidade acadêmica para mostrar a importância do uso correto dos elementos de usabilidade e design na experiência do cliente online.

**Annex I:**

Constructs (Scale Sources)

1. Online Experience Dimensions - Informativeness (adapted from Luo 2002)
   1. Information obtained from the product page is useful.
   2. I learned a lot from using the product page.
   3. I think the information obtained from the product page is helpful.
2. Entertainment (adapted from Hausman and Siekpe 2009)
   1. Not fun/fun
   2. Not enjoyable/enjoyable
   3. Not at all entertaining/very entertaining
3. Social presence (Gefen and Straub 2003)
   1. There is a sense of human contact in the web page.
   2. There is a sense of human warmth in the web page.
   3. There is a sense of human sensitivity in the web page.
4. Sensory Appeal (Jiang and Benbasat 2007b)
   1. The product presentation on this web page is lively.
   2. I can acquire product information on this web page from different sensory channels.
   3. This web page contains product information exciting to senses.
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DBA PROPOSAL

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Juiz de Fora, 2021 August

1. **Introduction**

The topic that will be studied in this article is the online customer experience and how an improvement in this user's experience can benefit companies' results. Internet shopping grows exponentially. In this way, companies of all types, whether retail or services, understood the need to be concerned with their customer's experience in digital environments. The pandemic has made that reality even more urgent. The customer experience is now not just limited to our physical experience, but digital as well.

Several authors have been studying the main elements that interfere in the online customer experience. In an article published by Bleir, Harmeling and Palmatier (2019) for the renowned Journal of Marketing magazine, the authors proved that design elements interfere in the online customer experience. Another article published by Huang and Cappel (2012) analyzed the interference of usability elements extracted from the US government report release in 2006 (US HHS/GSA, 2006) on the success of companies listed in the INC 500. Websites that make extensive use of usability elements tend to be more successful as a business.

The purpose of this study which comprises the future publication of three scientific articles, therefore, is to understand the impacts of design (Zhu and Zhang 2010) and usability (US.HHS/GSA, 2006) elements on the dimensions of the online customer experience: informativeness/Cognitive (Gentile, Spiller and Noci 2007), entertainment/affective (Babin, Darden and Griffin 1994), Social presence (Wang at al. 2007) and Sensory (Gentili, Spiller and Noci 2007).

Bleir, Harmeling and Palamtier (2019) were brilliant in analyzing and proving the impact of design elements on the customer's online experience. Through qualitative and quantitative research they were able to prove that all design elements (verbal, visual and mix elements) impact the customer's online experience. However, some theorists say (Cappel & Zhenyu, 2012) that in addition to design elements, there are other factors that interfere with the customer's online experience. The most cited by doctrine are the usability elements (US.HHS / GSA, 2006). According to Zhenyu Huang and James J. Cappel (2012), usability interferes in the online customer experience and also in the performance of the company as a whole. According to Lemon and Verhoef (2016), customer experience, in general, comprises a behavioral dimension. When we talk about the customer's online experience, this behavioral character cited by Lemon and Verhoef (2016) alludes to the elements of website use combined with design elements. This is the gap that this research wants to contribute to the academic community. It is intended to jointly analyze the usability and design elements in the online customer experience. Until now, the design elements and the elements of use were formed in an integrated way. It was concluded that both the design and the usability elements significantly interfere in the customer's online experience. Therefore, what we will test is whether a combination of both elements (design and usability) will interfere with the online customer experience in the same way that has been proven in isolation in previous articles. Therefore, our main hypothesis is: that the design elements and specifications together will impact equally or more than if used in isolation.

In the first article, the main objective is to analyze the impact of seven usability elements (Zhenyu & Cappel, 2012) combined with design elements (Bleier; Harmeling; Palmatier, 2019) to test their impact on the online customer experience. For this purpose, it is intended to build eight different websites, combining the usability elements in a structured way in each one of them. To define the structure of these websites in relation to the usability elements, we use the method of Tagushi (1986) which will be explained in the chapter on research methodology. To carry out the survey, we will interview people who will be exposed to these eight experiments at random in order to understand their perceptions regarding the elements of the online customer experience (Lemmon and Verhorf, 2016)

The second research will be an A / B test in order to understand which of the usability elements significantly interfere in customer engagement. We will direct Facebook ads to all pages in a hedonic and analogous manner. And let's look at which pages the customer has the greatest behavioral interaction (Lemon and Verhoef, 2016). Based on this study, we will be able to understand which of the usability elements applied together with the design elements interfere in the customer's engagement with the page in a consistent way.

And, after both studies, we will develop a conclusive research, analyzing the results of the first and second study and giving our academic contribution so that other scholars can continue the proposed line of research. Thus, the third study will be a thorough and conclusive analysis of previous research.

1. **Research question:**

Do elements usability, when used in combination of design elements, interfere with the online customer experience?

1. **Theorical References:** 
   1. **Dimensions of the online Customer Experience.**

As compared with brick-and-mortar retail, in an online system customer assess products through verbal (information) and visual stimuli (pictures and videos) not through physical interaction (Bleier, 2019). There are a huge number of research studies on offline experiences that are based on multiple, different, and linked dimensions including cognitive, sensory, affective, physical, and social (Brakus, Schmitt, & Zarantonello 2009; Lemon and Verhoef, 2016; Schmitt, 1999; Verhoef et al. 2009). On the other hand, the online research studies were mainly based simplistically because limited information was available through online sources (Novak, Hoffman, and Yung 2000; Steenkamp and Geyskens 2006).

Simply, previous research studies were based on the simple mechanism as compared with physical interaction research studies on customer experiences. According to Anderson (1985) & Pinker (1997), four basic systems of the human mind are known as cognition, affection, sensations, and relationships. So, in this research study, we conceptualize the online customer experiences based on four dimensions including informativeness/Cognitive (Gentile, Spiller, and Noci 2007), entertainment/affective (Babin, Darden, and Griffin 1994), sensory (Gentile, Spiller, and Noci 2007, and social presence (Wang et al. 2007). In simple words, the research study will be based on these four dimensions that are important to understand and evaluate the customer online experiences for purchasing products and services.

Lim and Ting (2012), defined dimensions of online customer experience as “the extent to which a website provides consumers with resourceful and helpful information.” As for the cognitive appeal that we conceptualize as informativeness, it is defined as the “primary cognitive dimension” in online customer experience. According to Gentile et al. (2007), the informativeness dimension consisted of website contribution in providing the customer help in deciding on purchasing specific product by following a process that including thinking, conscious mental processing, and solution oriented. Such kind of information is very important because such fact base information can improve the attitude of customers towards websites or web pages (Hausman and Siekpe 2009; Hsieh et al. 2014). In the same way, the interactions of the customer with products available on the website can evoke an affective domain that forces functional considerations regarding the products.

As the affective appeal is linked with the entertainment dimension of the online customer experience. In simple words, entertainment or we can say that immediate pleasure of online experience regardless of purchasing behavior is the key dimension in online customer experience and online purchasing (Babin, Darden, and Griffin 1994). According to Kukar Kinney (2010), the entertainment dimension is there to trigger arousal in online customer experience by turning a visitor into a customer and reduce the chances of putting the product into the card box. In simple words, we can say that the entertainment dimension is there to enhance to customer online experience on one side and increase the sales of the seller on the other side. However, the lack of physical availability of products cannot provide such benefits on online shopping.

However, to match with the offline experience, the seller puts effort into making a good social presence of products and services. In other words, the seller tends to show an attractive dimension of their products to visitors to make the social presence of their product in the online market (Wang et al. 2007). Gefen & Straub defined the social presence of a product when it refers to the “warmth, sociability, and feeling of human contact that web site offers (2003).” The social presence of a product or website is very important because it can increase the perceived tangibility and increase the feeling of closeness from customers to products (Darke et al. 2016). Furthermore, the dimension of the social presence of a website can also increase the flow in online shopping and purchasing behavior of customers as well (Cyr et al. 2007).

The last but not least, the sensory dimension of customer experience may include aspects like sound, sight, taste, smell, and touch (Gentile, Spiller, and Noci 2007). There are many scholars like Zajonc (1980) that argued that this dimension of sensory appeal happened automatically and mainly it derived preference on product selection and purchasing. According to Steuer (1992) sensory appeal in an online environment is “the representational richness of a mediated environment as defined by its formal features (p.81).” It is also the fact that in online entertainment it is quite different to obtain all the scope of sensory experience, but the sensory appeal can be increased by using imagery domain like pictures and videos (Elder et al. 2017).

The product website is believed to be the heart of the online customer experience. It is mainly based on verbal stimuli and visual stimuli that are necessary elements for the construction of any web page. In this study, our focus was on the interference of usability and design elements in the online customer experience. We intend to test which usability elements most interfere with the dimensions of the online customer experience described above. In order to measure the impact of usability elements in the dimensions informativeness, entertainment, Social presence and sensory component, a questionnaire was developed to carry out the research (Annex I). This questionnaire was the same one used by Bleier, Harmeling and Palmatier (2019) in their article on the impact of design elements on the online customer experience.

* 1. **Webpage Design Elements**

Verbal Elements

Verbal elements are based on a written word or we can say that verbal elements are based on the text regarding the product. Further, the verbal elements may consist of the linguistic style of the text, descriptive details regarding the product, the number of bulleted features, and most importantly it consists of the return policy of the product (Bleier, Harmeling and Palmatier, 2019).

The linguistics style of the verbal elements consists of word choice, use of questions, pronouns, etc.—that are used to enhance the product conversions and increase the consumer trust on the website (Ludwig et al. 2013; Song & Zinkhan, 2008). Song & Zinkhan (2008) argued that there is preliminary evidence that linguistic style put a great impact on the social presence of the product. Furthermore, by providing more attributed information regarding a product we can enhance the evaluation of the product and can increase the consumers buying behavior (Cooke et al. 2002; Hauser et al. 2009).

In the same way, using the number of bulleted features is very important to increase the website's effectiveness and product sales. It is because when a feature of the product is listed on the top of the website/webpage regarding the product, it provides an opportunity for the visitor to understand and imagine the product which turns visitor into buyer. Furthermore, the return policy is a very precious element in the online customer experience. That’s because it is directly linked with the web page effectively, as buyers are always concerned about the money so it is crucial to provide important information regarding the return policy of the product so the buyer can easily decide to purchase the product.

Visual elements

According to Scott (1994), visual elements consisted of all content that is presented in a photographic form which is mainly used to convey the symbolic meaning of the product. Visual elements can also divide into further like feature crops, lifestyle photos, size, and videos regarding the product.

Feature crops are important because it zooms in or highlights a key product feature which is not visible in the picture of the product. In the same way, lifestyle photo provides the customer with the imagination power to live with the product in a regular setting. It means that this feature provides a product picture while using it in a real-life setting that can enhance the customer's attention towards the product. According to Lemon and Verhoef (2016), the image of the product in larger size increased the purchase attention of the visitor. And at last, the video regarding the product to illustrate the key feature and other benefits of the product and its way of use can enhance the attention of the customer as well as the purchasing attention of the customer.

Mixed elements: Verbal/Visual Elements

Customer star ratings, comparison matrices, expert endorsements, recommendation agents, and content filters all are together known as verbal and visual elements of the mixed method. Customer star ratings are generated by the customer to let other customers known about the product usage and seller behavior (Chevalier & Mayzlin, 2006). Expert endorsement is something to include experts of the field to provide product evaluation based on their expertise and experience (Ansari et al. 2000).

Comparison matrices are the facility provide by the web pages in which a focal product is compared with another same kind of product to provide the customer with an in-depth understand and differences among them. In the last, the recommendation combines both verbal and visual information of the product to generate the alternatives feature of the focal product (Lamberton and Stephen 2016). In general, it is very important to understand the elements of online customer experience as well as the usability of the website to completely evaluate the online customer experience.

* 1. **Websites usability Elements:**

The usability measure of the website is very important because it gives the user with freedom and facility that they may need while exploring the website (U.S/HHS/GSA, 2006). The site search capability, of any website is the facility in which the website allows its visitors/users to search specific content or product within the entire website.

We have chosen the elements that we will use in this survey on the U.S/HHS/GSA website, 2006, this guide was developed by the US Department of Health and Services (HHS). They established several guidelines based on user usability surveys to guide internet professionals to create responsive and user-friendly web sites for the public. Since its introduction in 2003, the Guidelines have been widely used by government agencies and the private sector so this guide was chosen as a reference for usability elements in this project.

The document developed by HHS has 18 aspects of user usability which mark the chapters of the document. Within these strands we have 209 usability elements. If we were to test all of them, the research presented here would be unfeasible, so we selected only 7 elements, which are the most important, as established by the criteria below.

The User Design and Usability Guide itself (U.S HHS/GSA, 2006) ranks usability elements from 1 to 5 on two criteria: relative importance and strength of evidence. The relative importance was defined by specialists in the field of design and usability, with a score of 5 given to those criteria that have greater importance in the user's usability compared to the others.

And the strength of the evidence is whether there really is evidence that such criteria are really relevant and easy to identify on the page. The criteria used to determine the strength of evidence are described below (U.S HHS/GSA, 2006, p. 24)

5 – Strong Research Support

• Cumulative and compelling, supporting research-based evidence

• At least one formal, rigorous study with contextual validity

• Not known conflicting research-based findings

• Expert opinion agrees with the research

4 – Moderate Research Support

• Cumulative research-based evidence

• There may or may not be conflicting research-based findings

• Expert opinion

• Tends to agree with the research, and

• A consensus seems to be building

3 – Weak Research Support

• Limited research-based evidence

• Conflicting research-based findings may exist

- and/or -

• There is mixed agreement of expert opinions

2 – Strong Expert Opinion Support

• No research-based evidence

• Experts tend to agree, although there may not be a consensus

• Multiple supporting expert opinions in textbooks, style guides, etc.

• Generally accepted as a ’best practice’ or reflects ’state of practice’

1 – Weak Expert Opinion Support

• No research-based evidence

• Limited or conflicting expert opinion

Therefore, we used as a criterion for choosing the usability elements that we will work with in this study grades of relative importance equal to 5, so only elements that have maximum importance in comparison with the elements listed in the usability guide will be analyzed. And strength of evidence equal to or greater than 4.

Thus, objectively, we choose only the most important elements compared to the others and with relevant academic evidence both for analysis and to determine the object on the website. After filtering the criteria presented, we arrived at just 7 usability and design elements: 1) Provide useful contente (U.S HHS/ GSA, 2006, p.2), 2) Estabilish user requirements (U.S HHS/ GSA, 2006, p.2), 3) Place important itens at the top center (U.S HHS/ GSA, 2006, p.47), 4) use meaningful link labels (U.S HHS/ GSA, 2006, p.86), 5) make action sequences clear (U.S HHS/ GSA, 2006, p.159), 6) clear organization and information (U.S HHS/ GSA, 2006, p.170), 7) ensure that necessary information is displayed (U.S HHS/ GSA, 2006, p.171).

Below is a short summary of what each of the elements that will be analyzed in this study mean:

Provide useful content

Content is information provided on a website. Providing user-relevant content is one of the key elements of usability. He is the most important, as he is the only one that got top marks in the usability guide criteria. Therefore, this element, preys that the website developer provides content engaging, relevant, and appropriate for the audience. The guide even advocates that there are studies (Spyridakis, 2000 ) that have proven that content is the most critical element of a website. And that gets to be more important in usability than navigation, visual design, functionality and interactivity (U.S HHS/GSA, 2006, p.2).

Estabilish user requirements

This item recommends that the developer must use all available resources to improve and understand the user's requirements. The greater the number of exchanges of information with potential users, the better their understanding will be and the better it will be for the developer. Therefore, the greater the interaction with your user, the greater the probability of having an excellent website. This can include customer support lines, customer surveys and interviews, bulletin boards, vendors, user groups, trade show experiences, focus groups, etc. Successful projects require at least four (and on average five) different sources of information. Do not rely too much on user intermediaries (U.S HHS/GSA, 2006, p.2).

Information collected in exchanges with users can be used to build 'Use Cases'. Use cases describe the things users want and need the website to be able to do (U.S HHS/GSA, 2006, p.2).

Place important itens at top center

Place the most important items at the top of the page layout to make it easier for users to find information. Or users usually look at the top center of a page first, then look left, then right, and finally start moving systematically down the entire web page.

All critical content and navigation options should be at the top of the page. Particularly on navigation pages, most of the top choices should be visible without, or minimal, scrolling (U.S HHS/GSA, 2006, p.47).

Use Meaning link labels

Use link labels and concepts that are meaningful, understandable, and easily differentiated by users rather than designers. To avoid user confusion, use link labels that clearly differentiate one link from another. Users must be able to look at each link and learn something about the destination of the link. Using terms like 'Click here' can be counterproductive. Clear labeling is especially important when users browse available links. The more decisions users must make about links, the more opportunities they have to make a wrong decision (U.S HHS/GSA, 2006, p.86).

Make action sequences clear

When describing an action or task that has a natural order or sequence (assembling instructions, solving problems, etc.), structure the content so that the sequence is obvious and consistent. Time-based sequences are easily understood by users. Do not force users to perform or learn tasks in an unusual or strange sequence (U.S HHS/GSA, 2006, p.159).

Organize information Clearly

Organize information at each level of the Site so that it shows a clear and logical structure to typical users. Designers must present the information in a structure that reflects the user's needs and website goals. The information must be well organized on the site: level, page level and paragraph or list level. Good website and page design allows users to understand the nature of the website's organizational relationships and will support users in locating information efficiently (U.S HHS/GSA, 2006, p.170).

Facilitate Scanning

Structure each content page for easy scanning: use clear, well-placed titles; short sentences and sentences; and small readable paragraphs. Sites optimized for scanning can help users find desired information (U.S HHS/GSA, 2006, p.171).

Users who scan generally read headlines but don't read full text in prose - this results in users missing information when a page contains dense text. Studies report that about eighty percent of users scan any new page. Only sixteen percent read each word. Users spend about twelve percent of their time trying to locate the desired information on a page (U.S HHS/GSA, 2006, p.171).

To make it easier to get information, place important titles at the top of the center section of a page. Users tend to scan until they find something interesting and then read it. Designers must help users ignore large chunks of the page at a single glance. Keep in mind that older users (70 and over) will tend to scan much more slowly on a web page than younger users (age 39 or younger) (U.S HHS/GSA, 2006, p.171).

The figure 1 summarizes the usability elements that we will apply in our experiments. It is intended to test, through a series of experiments, which usability elements, which, combined with the design elements, most interfere in the online customer experience and in their engagement with the website.

Some researchers such as Bleier, Harmeling and Palmatier (2019), tested and proved that design elements are capable of significantly interfering with the online customer experience. However, nothing was said in the research regarding the usability elements.

Therefore, this work intends to be dedicated to testing this academic gap. It is intended to understand which usability elements (U.S HHS/GSA, 2006) most interfere in the online customer experience when combined with the design elements.

Diagrama

Descrição gerada automaticamenteFigure 1: Illustrative summary of what will happen in the survey: The impact of usability elements on the online customer experience on engagement and conversion rates.

1. **Hypotheses**

As we can see in the literature review, several authors are analyzing the elements that can, in some way, interfere in the online customer experience. It was proven through the research of Bleier and Palmatier (2019) that all design elements (visual, verbal and mix) significantly interfere in the online customer experience.

However, it was not only the design elements that were the subject of research in this area. Huang and Cappel (2012) believe that usability elements (US.HHS / GSA, 2006) are present on the websites of the best companies in the world. That is, there is a high probability that these usage elements also significantly interfere with the online customer experience.

Therefore, what we want to test in this work is whether usage elements (US.HHS / GSA, 2006) combined with design elements (Bleier; Harmeling and Palmatier, 2019) interfere in the online customer experience in an equal or even more limited way. than was found in previous research when these elements were tested in isolation.

1. **Metodology:**

As the study by Bleier (2019) has already proved that there is a correlation between the application of design elements to the best online customer experience. Our mission here is to combine the design elements and test whether the usability elements have a similar result.

We will use only 7 usability elements that are most relevant, according to the criteria of the US usability guide (U.S HHS/GSA, 2006), as explained earlier in the theoretical framework, this guide presents 209 usability elements. Testing the 209 would be a very difficult task, so we decided to choose only 7 elements that, according to the guide itself, are the most relevant for the user's usability. The document we are basing ourselves on has 2 criteria to classify the elements present in them: relative importance and strength of evidence. Both criteria were fully explained in the session on the theoretical framework.

We chose only the usability elements that have a maximum score (5) in relative importance and a score greater than 4 in strength of evidence: They are:1) Provide useful contente (U.S HHS/ GSA, 2006, p.2), 2) Estabilish user requirements (U.S HHS/ GSA, 2006, p.2), 3) Place important itens at top center (U.S HHS/ GSA, 2006, p.47), 4) use meaningful link labels (U.S HHS/ GSA, 2006, p.86), 5) make action sequences clear (U.S HHS/ GSA, 2006, p.159), 6) organization information clearly (U.S HHS/ GSA, 2006, p.170), 7) ensure that necessary information is displayed (U.S HHS/ GSA, 2006, p.171).

Testing the effects of such a large number of elements represents a considerable empirical challenge. A full factorial design would have required the construction and analysis of 128 different sites (27). With this approach, we could have investigated all the potential interaction effects between the usability elements, but it would have been unfeasible to execute. Therefore, we adopted an orthogonal matrix design by Taguchi (1986), which reduced the required number of sites to 8 (as shown in Figure 2).

A Taguchi experiment is a designed experiment that allows you to choose a product or process that works most consistently in the experimental environment. Taguchi experiments recognize that not all factors causing variability can be controlled. These uncontrollable factors are called noise factors (Tagushi, 1986). Taguchi experiments try to identify controllable factors (control factors) that minimize the effect of noise factors. During experimentation, you manipulate noise factors to force variability to occur and determine optimal control factor settings that make the process or product robust or resistant to variations caused by noise factors. A process designed with this goal will produce more consistent output. A product designed with this goal will provide more consistent performance regardless of the environment in which it is used (Tagushi, 1986).

Taguchi experiments use orthogonal matrices that estimate the effects of factors on the mean and variation of the response. An orthogonal matrix means that the experiment is balanced so that factor levels are weighted equally (Tagushi, 1986). For this reason, each factor can be evaluated independently of all other factors and the effect of one factor does not affect the estimation of another factor. This can reduce the time and cost associated with the experiment when using fractional designs (Tagushi, 1986).

Image 2 shows the experiment of Taguchi L8 (27) Taguchi (orthogonal array). L8 means 8 different sites. 27 means 7 usability elements mentioned above with 2 levels each (present and not present). If the full factorial design were used, there would be 27 = 128 sites, making the design unfeasible to run. The L8 matrix (27) requires only 8 sites: a fraction of the full factorial design (Tagushi, 1986).

This matrix is ​​orthogonal, that is, the factor levels have the same weight throughout the experiment. The table columns represent the control factors (usability elements), the table rows represent the sites produced (combinations of factor levels), and each table cell represents the factor level for the site.

Uma imagem contendo Texto

Descrição gerada automaticamente

Figure 2: Exemple of how the Tagushi orthogonal matrix will be applied at the assignment. (Tagushi, 1996)

Thus, we understand as level 1 that the usability element is somehow present and level 2 that the usability element is not present. Table 2 shows, in a simplified way, how the websites will be developed. Remembering that we will use a single company, the same content and audience, varying only the presence or not of usability elements.

Table 2: A summary of how it will be built on web sites.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Provide useful content | Establish user requirements | Place important items at top center | Use meaningful link labels | Make action sequences clear | organization information clearly | Ensure that necessary information is displayed |
| Site 1 | Present | Present | Present | Present | Present | Present | Present |
| Site 2 | Present | Present | Present | Not present | Not present | Not present | Not present |
| Site 3 | Present | Not present | Not present | Present | Present | Not present | Not present |
| Site 4 | Present | Not present | Not present | Not present | Not present | Present | Present |
| Site 5 | Not present | Present | Not present | Present | Not present | Present | Not present |
| Site 6 | Not present | Present | Not present | Not present | Present | Not present | Present |
| Site 7 | Not present | Not present | Present | Present | Not present | Not present | Present |
| Site 8 | Not present | Not present | Present | Not present | Present | Present | Not present |

We will probably use an object of study, an aesthetic clinic, which has several stores throughout Brazil and which sells beauty services for women such as artificial tanning, slimming procedures, etc. The website mockup and design and usability elements can be seen in annex II of this document.

1. **Study Limitations:**

The main limitations of the study presented in this proposal is the use of only one object of study, that is, a market segment, which will be Brazilian aesthetic clinics. And the use of only seven usability elements in the project scope, since there are more than x usability elements that can be used on sites of all types. It is hoped that this study will contribute to the academic community to show the importance of the correct use of usability and design elements in the online customer experience.

**Artigo 1:**

The purpose of this articles are understand the impacts of design (Harmeling; Palamtier, 2019) and usability (US.HHS/GSA, 2006) elements on the dimensions of the online customer experience: infomativeness/Cognitive (Gentile, Spiller and Noci 2007), entertainment/affective (Babin, Darden and Griffin 1994), Social presence (Wang at al. 2007) and Sensory (Gentili, Spiller and Noci 2007).

It is expected, based on the theoretical framework, that the usability elements can and will interfere with the online customer experience, as we saw in the theoretical framework.

To test this first hypothesis, we will recruit 160 interested in the services of an aesthetic clinic, a partner in the project, who will be exposed to the 8 sites created. This number of experiments was based on the Tagush matrix (1986) exposed earlier in the methodology chapter. The definition of the sample quantity was according to the article by Fakis et al (2014). Therefore, the method used in the research of the first article has a quantitative character. At first, the interviewees will be women between 20 and 50 years old, Brazilian, since this is the target audience of our study. Women will be chosen at random. Respondents will be randomly exposed to one of the 8 experimental cells (sites), will be presented to the corresponding web page and instructed to explore it for at least 45 seconds. They will then complete a questionnaire with demographic questions, and items for checking manipulation and realism, and pre-existing scales to measure purchase intentions and the four dimensions of experience (see Annex I). Each element of usability is expected to significantly interfere with the online customer experience as exposed by the literature presented above.

**Research Schedule:**

October 2021: Creation of sites

November 2021 to February 2022: Research development

March 2022 to April 2022: Analysis of results

May 2022 to July 2022: Finalization of the article.

**Article 2:**

The aim of this second study is to explore the impacts of usability elements combined with design elements on user engagement with the page. Usability elements are expected to significantly interfere with page engagement, and possible conversion of site users.

To test our hypothesis we will use a well-known quantitative approach: A/B testing. We will expose the 8 pages previously developed combining design elements with usability. Remembering that the justification for using the 8 pages is based on the Tagushi method (1996) explained in the methodology chapter of this same document. Each of the eight pages will be randomly exposed to 5,000 users. The experiment will therefore have a total exposure of 40,000 users (Fakis, A. et al. 2014). The objective of this experiment is to analyze whether the usability elements interfere in the engagement and conversion of these users.

To extract the result of this search, we will use Google's data analysis tools, such as Google Analytics. And to increase qualified traffic to 8 pages and get a satisfactory sampling, we will use Facebook's Ad Tool. The ads will run for 1 month and, at random, will direct qualified users to the eight previously created pages. From there, when we reach the impression rate of 5,000 visitors per page, we will analyze the engagement of those visitors with the pages through Google analytics.

**Research Schedule:**

July 2022 to August 2022: Run ads and collect data

August 2022 to September 2022: compile data and develop conclusions

October 2022 to December 2022: Finalize article

**Article 3:**

Objective: To compile the results gathered from previous surveys and carry out a holistic analysis of the impact of usability elements on the online customer experience and engagement. The result we expect from this survey is that usability elements are essential to online customer experience and engagement.

Probably to complement this article, we will conduct an exploratory qualitative research to understand how the usability elements interfere in the online customer experience

**Research Schedule:**

January 2023 to March 2023: Structuring the research

April 2021 to June 2023: Search execution

June 2023 to September 2023: Finalize the article

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**Annex I:**

The respondents will give a score from 1 to 5 for each of the questions below. (Fakis, A. et al. 2014)

Constructs (Scale Sources)

1. Online Experience Dimensions - Informativeness (adapted from Luo 2002)
   1. Information obtained from the product page is useful.
   2. I learned a lot from using the product page.
   3. I think the information obtained from the product page is helpful.
2. Entertainment (adapted from Hausman and Siekpe 2009)
   1. Not fun/fun
   2. Not enjoyable/enjoyable
   3. Not at all entertaining/very entertaining
3. Social presence (Gefen and Straub 2003)
   1. There is a sense of human contact in the web page.
   2. There is a sense of human warmth in the web page.
   3. There is a sense of human sensitivity in the web page.
4. Sensory Appeal (Jiang and Benbasat 2007b)
   1. The product presentation on this web page is lively.
   2. I can acquire product information on this web page from different sensory channels.
   3. This web page contains product information exciting to senses.

**Annex II:**

Uma imagem contendo Interface gráfica do usuário

Descrição gerada automaticamente