Category: STEM (Science, Technology, Engineering and Mathematics)

ORIGINAL

Evaluating the quality of website design aspects and its effect on functional perspectives using Smart-PLS in Web-based apparel shopping environment

Evaluación de la calidad de los aspectos de diseño del sitio web y su efecto en las perspectivas funcionales mediante Smart-PLS en un entorno de compra de ropa a través de la web

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ABSTRACT

Purpose: the necessity for e-commerce business to adopt customer-centric tactics in addition to retail strategies for the growth of e-commerce business is required. The primary objective of this study is to develop an effective measurement scale for assessing the quality of website design and its effect on functional benefits in web-based apparel shopping.

Design/ Methodology: the comprehensive framework for evaluating the quality of website design was subsequently accompanied by the collection of data through a web-based survey. The structured questionnaire had a total of 500 consumers of e-commerce websites. Using structural equation modelling (SEM) within the Smart-PLS software to investigate the research's hypotheses.

Findings: the data analysis findings suggest the influence of these website design elements on the performance of e-commerce companies. With the analysis of the Smart-PLS there is substantial positive impact of Website aesthetics (WA-EC), Website personalization (WP-EC), and Price Offerings (PO-EC) on Website design quality (WDQ-EC). Additionally, it is worth noting that the quality of website design has a positive effect on the functional benefits experienced by consumers. More studies can be conducted to explore the realm of mobile commerce and its associated factors pertaining to mobile design in future.

Practical Implications: the results of this study provide valuable insights for web-based service managers seeking to enhance their understanding of the factors influencing website design quality and the relative importance of each dimension in delivering functional benefits especially in apparel sector. By leveraging these findings, managers can effectively enhance the website design quality of e-commerce websites, aligning it with current market developments, and ultimately contribute to the retention of consumer values.

Originality/Value: an empirical model which shows the determinants of WDQ-EC. To the best of the authors' knowledge, a WDQ-EC framework is modelled considering a specific combination of exogenous variables especially in apparel websites, which is not done by past researchers.

Keywords: Website Design Quality; Aesthetics; Personalization; Price Offerings; E-commerce Websites.

RESUMEN

Propósito: es necesario que las empresas de comercio electrónico adopten tácticas centradas en el cliente además de estrategias de venta al por menor para el crecimiento del negocio del comercio electrónico. El objetivo principal de este estudio es desarrollar una escala de medición eficaz para evaluar la calidad del

diseño de un sitio web y su efecto en los beneficios funcionales de la compra de ropa a través de Internet.

Diseño/ Metodología: el marco global para evaluar la calidad del diseño de los sitios web se acompañó posteriormente de la recogida de datos mediante una encuesta a través de Internet. El cuestionario estructurado contó con un total de 500 consumidores de sitios web de comercio electrónico. Se utilizó el modelo de ecuaciones estructurales (SEM) del programa Smart-PLS para investigar las hipótesis de la investigación.

Resultados: las conclusiones del análisis de datos sugieren la influencia de estos elementos de diseño de sitios web en el rendimiento de las empresas de comercio electrónico. Con el análisis del Smart-PLS se observa un impacto positivo sustancial de la estética del sitio web (WA-EC), la personalización del sitio web (WP-EC) y la oferta de precios (PO-EC) en la calidad del diseño del sitio web (WDQ-EC). Además, cabe destacar que la calidad del diseño del sitio web tiene un efecto positivo en los beneficios funcionales experimentados por los consumidores. En el futuro se podrán realizar más estudios para explorar el ámbito del comercio móvil y sus factores asociados relacionados con el diseño móvil.

Implicaciones prácticas: los resultados de este estudio aportan información valiosa a los gestores de servicios web que deseen mejorar su comprensión de los factores que influyen en la calidad del diseño de los sitios web y la importancia relativa de cada dimensión a la hora de proporcionar beneficios funcionales, especialmente en el sector de la confección. Aprovechando estas conclusiones, los gestores pueden mejorar eficazmente la calidad del diseño de los sitios web de comercio electrónico, alineándola con la evolución actual del mercado, y contribuir en última instancia a la retención de los valores de los consumidores.

Originalidad/Valor: un modelo empírico que muestra los determinantes de WDQ-EC. Según el leal saber y entender de los autores, se modela un marco WDQ-EC considerando una combinación específica de variables exógenas especialmente en sitios web de ropa, lo que no hacen investigadores anteriores.

Palabras clave: Calidad del Diseño Web; Estética; Personalización; Oferta de Precios; Sitios Web de Comercio Electrónico.

INTRODUCTION

Technological breakthroughs, shifts in consumer tastes, and adopting new business strategies influence the emergence of e-commerce apparel enterprises. This article offers a comprehensive analysis of significant advancements in the progression of e-commerce in the apparel retailing industry. In the early 1990s, digital booksellers such as Amazon.com and stylish clothes retailers like Bluefly.com appeared as founders of electronic commerce. Eventually, in the 1990s and Early 2000s, there was a significant growth of online stores that concentrated on selling apparel. One such example is ASOS.com. In the middle of the 2000s and 2010s, Gilt.com pioneered the flash sale method, selling unique luxury apparel for a limited duration. Throughout the 2010s, the introduction of internet rental companies such as RenttheRunway.com permitted the rental of high-end gowns and accessories for numerous occasions. Since the beginning of the 2020s, there has been a noticeable increase in the focus on personalization in e-commerce apparel websites. Thus, the study concentrates on website personalization as one of the variables.

The apparel industry encompasses various products, spanning athletics, office wear, and high-end luxury items. However, in 2022, the apparel sector faced more difficulties due to high inflation. Production expenses increased together with a decline in customer value, such as confidence.

The influence of the fashion and apparel industry on customers' preferences, such as their desire for a good quality of life, is apparent on a global scale. With the exponential growth of e-commerce sales reaching trillions of dollars worldwide, it is unsurprising that the online apparel market also experiences annual expansion. The global apparel market was projected to experience a sales growth of 0,2 trillion USD (+11,49 percent) between 2023-2027 Statista (2023). The marketplace is launched to earn $1,94 trillion in revenue in 2027. Most consumers choose to make their apparel purchases online, as it is one of the prominent segments in the apparel business.

With digital advancements, the Internet has become essential to our everyday purchases. E-commerce has become indispensable to our daily routines and is steadily expanding as a market. As the global accessibility of the Internet continues to experience significant growth, with five billion Internet users worldwide, the prevalence of online shopping is steadily rising, leading to an increasing number of individuals engaging in e-commerce shopping activities. According to predictions, global retail e-commerce sales will surpass 5,7 trillion USD in 2022. According to these forecasts, the new heights are expected to grow almost 56 percent in the coming years, ultimately reaching a value of around 8,1 trillion dollars by 2026. As of 2022, online marketplaces hold the predominant portion of global internet purchases. International purchases occupy the top position in the worldwide hierarchy of e-commerce platforms. Apparel is the prominent business-to-Consumer (B2C) sector

vertical, representing significant contributors to online retail sales.

The United States currently occupies the highest position in the revenue ranking of the apparel market, with a total generated revenue of 311 billion US dollars. China closely trails behind with a total revenue of 286 bn US dollars, which presents a forecasted comparison of global apparel market revenues. The third position is India, valued at 87 billion US dollars. This third position highlights a substantial discrepancy of 224 billion US dollars compared to the United States. Therefore, the current study centers on e-commerce retail websites, explicitly purchasing apparel products in India. Firms and organizations, from newly established entities to highly recognized ones, endeavor to expand their consumer reach to optimize their gains by promoting their products or services via their apparel websites. India's top four e-commerce apparel online marketplaces are Amazon, Flipkart, Myntra, and Snapdeal, according to Statista Apparel India. Based on data from similarweb.com and ecommerceguide.com, Nykaa Fashion is recognized as the sixth leading apparel website platform in India. Thus, the present study provides a comprehensive analysis of the top e-commerce companies in the field of apparel, namely Amazon, Flipkart, Myntra, Snapdeal, and Nyka Fashion, especially in India.

Designed graphical user experience favors consumers, encouraging them to utilize the shopping website repeatedly. In addition, the design quality of websites significantly influences users' willingness to engage in shopping activities. Assessing website design quality and its impact on consumers is a significant focus for internet businesses and researchers. The quality of website design directly influences consumers' initial online purchasing behavior.

The e-commerce apparel websites showcase a wide range of characteristics about the quality of website design. Hence, it is imperative for any research to comprehensively examine the diverse aspects of website design quality qualities in the particular context of the e-commerce apparel industry. Furthermore,[1] highlights that no specific product category explicitly acknowledges the significance of website design quality on e-shopping websites. Hence, it is crucial to establish appropriate product classifications and website design standards applicable in the Indian context. Statista.com predicts that the domestic e-commerce business will be valued at $200 billion by 2027, according to projections. The expansion is anticipated to be propelled by the apparel industry.

Researchers often find that website design includes customer perception of aesthetics (color, graphics, and layout), personalization (customized products and services), and pricing offers and discounts for desired products. This research focuses on website aesthetics, personalization, and product/service price offerings. According to,[2] the primary concern in website design quality resides in three dimensions. Thus, the study explores website design quality in e-commerce apparel websites.

A website with high-quality systems, information, and electronic service quality is crucial for success in electronic commerce. With the advancement of website design, companies prioritize the arrangement of the website and its content. Nevertheless, an excessive emphasis on design and content may make companies aware of significant trends in the broader Internet market, consequently leading to subpar Internet marketing strategies. Marketers may also employ strategies to promote internet usage to mitigate the risk of undesirable consequences, such as avoiding websites. According to,[1] an effective website design should prioritize usability with a combination of aesthetically pleasing aspects, personalized websites, and offers, enticing consumers to engage with the website. Additional research should be conducted to explore additional suitable outcomes and incorporate a measurement of e-service quality characteristics, namely website design quality. Consumers want functional benefits such as convenience, time efficiency, and a seamless online shopping experience. [3] discusses a challenge in assessing and enhancing the conceptualization and measurement of each benefit notion, particularly about specific product categories. These benefits offer valuable insights into segmentation and value strategies. The functional perspective as an outcome is a novel outcome that needs more attention. Therefore, the research focuses on the website design quality and its effect on functional aspects in the apparel product purchase category in e-commerce retailing. Also, this study aims to construct a theoretical framework that establishes a connection between various elements of website design quality and its subsequent effects. The theoretical foundation of the framework is based on means-ends-chain theory, as proposed.[4] This study presents several notable contributions. The initial step involves employing the means-ends-chain theory to construct a conceptual framework that integrates the current theoretical and empirical research. Furthermore, the outcomes of our experimentation with this framework offer valuable insights for managers and researchers on the conceptualization and assessment of website design quality and its relationship with unique antecedents and outcomes. The present study objectives are:

- To analyze the relationship between the perception of website design quality (WDF-EC) and its positive influence on website aesthetics (WA-EC), personalization (WP-EC), and price offerings (PO-EC) in web-based apparel shopping.
- To examine whether the website design quality (WDF-EC) has a significance effect on functional aspects in web-based apparel shopping.

Theoretical framework

The theoretical foundation for the conceptual model of website design quality on functional benefits is established by the means-ends-chain theory; website design evaluation was proposed.[1] However, website design quality on functional benefits relationships is limited in the e-commerce apparel shopping context. According to,[5] this theory posits that consumers possess and maintain product information in memory across several levels of abstraction. The statement asserts that consumers can assess their interactions with an online retail platform by focusing on distinct and tangible occurrences at an attribute level. These occurrences can afterward be amalgamated and connected to broader, more conceptual dimensions. For example, consumers tend to assess their consumption encounters based on distinct features of online stores, such as the visual appeal or "aesthetics," which can subsequently be linked to broader performance aspects like the overall quality of the website design. The conceptual model that has been built represents a relationship between means and ends, where means refer to attributes such as website aesthetics, website personalization, and price offerings, consequences refer to website design quality and ends refer to functional benefits.

Literature review

Website aesthetics (WA-EC): There has been a prevailing trend in recent years to adopt a more straightforward interpretation of aesthetics, focusing primarily on its association with beauty. Upon entering a website, consumers' initial stimuli are the visual design and aesthetic components.[6] are two studies conducted in the initial 50 milliseconds; the website's visual elements, such as colors, shapes, font styles, and images, are scanned by consumers before any content is observed. Thus, the author confirms website aesthetics is an important attribute to assess the website design quality. The notion of website aesthetics pertains to the extent to which the design of a website is aesthetically pleasing and successfully communicates a distinct and identifiable identity. [1] points out that some studies show that visual and aesthetic appeal impact how effectively consumers assess the quality of website design in online stores. Hence, it is clear that aesthetics largely influences the design of websites. The evaluation of website aesthetics needs attention to some particular product categories.[7] limit the website aesthetic research in population size. The study investigation is constrained by the limitations imposed by the sample size. Graduates predominantly employ consumer research, encompassing online research as a critical component. Nevertheless, as mentioned about the website aesthetics, there needs to be more attention to these factors to generalize the facts. Apart from this, the methodology utilized in past website aesthetics research is mainly with graduates. Carlota Lorenzo-Romero mentions that more investigation should be into a diversified population, encompassing other factors such as age, socioeconomic status, and economic situation. Therefore, the present study focuses on the challenges mentioned above regarding website aesthetics and fills the void about the website design quality impacts website aesthetics by adding specific product segments, different age groups, and population sizes, which can enhance the generalization of the results.

Website Personalization (WP-EC):[8] define *website personalization* as providing tailored content and services by leveraging consumer databases and modifying offers to align with consumer preferences. In conventional brick-and-mortar businesses, personalization pertains to providing consumer service through direct interpersonal interaction, intending to fulfill their needs. Web-based businesses can monitor customers› past purchasing patterns and adjust when and how companies exhibit based on that customer information using personalization tools. Personalization strives to provide consumers with the appropriate apparel items delivered at an ideal moment and in the most favorable location to satisfy their preferences and needs. Providing personalized items, offerings, and interactions benefits customers and web-based companies by meeting individuals› specific tastes and interests. Numerous studies have indicated that personalization strategies are essential for consumers as research determines a mutually beneficial connection with an e-commerce business. Also, personalized services are designed to assist consumers in their online decision-making process by providing recommendations for products or services. Utilizing personalized services can enhance clients' involvement with a given website. [11] discuss the impact of changes in personalized websites on website design assessment, which poses a significant problem.[9] say website personalization needs in-depth analysis in the e-commerce sector to establish the generalizability of the research findings. Furthermore, academics acknowledge the potential need for other methodologies to investigate causal impacts in website personalization studies. Hence, the research highlights methodological obstacles within the domain of website personalization study. Thus, the present study evaluates how the changes in personalization affect the website design evaluation in e-commerce websites, using different methodological aspects.

Price Offerings (PO-EC): Price offerings are referred to as "discounts," "free shipping," or "low prices" during the purchase of products or services in e-commerce. E-commerce shopping websites link to advantageous deals, special offers, and competitive pricing across many product and service categories.[10] Price offerings are crucial in a study of consumers' perception of e-commerce purchasing. The study explains the consumer's perception of reduced expenses when engaging in digital purchases instead of physical purchases. Typically,

shoppers prioritize lower-priced things. In order to gain a more extensive consumer base, online retailers often employ price discounts and coupons as a promotional strategy for their products. The managerial perspective, indicating that e-commerce websites catering to consumers should prioritize improving the range of products they offer, providing competitive pricing, and effectively communicating these attributes through their website design strategies.[1] state that price offerings are vital for measuring website design.[11] assesses how consumers perceive website design as significantly impacted by various factors, including price offerings, website personalization, and website aesthetics. Consumer apparel buying is based on their price offerings. Applying past studies on price offerings in practical settings is challenging because of the absence of a well-defined connotation and assessment scale. Also, whether it works equally well in other countries apart from the US is challenging. Therefore, this paper presents a comprehensive set of measuring indicators for price offerings, establishing a solid theoretical foundation for practitioners and researchers to investigate strategies for enhancing website design quality. In addition, this research also checks whether the measurement model works in emerging country (India).

Website Design Quality (WDF-EC): In traditional trade practices, businesses perform with the need for face-to-face interactions between the company and the end user. Whereas in the e-commerce business, the exclusive mediator for all interactions between the parties will be a website.[13] Numerous e-commerce businesses have consequently allocated considerable funds towards enhancing their websites. The significance of this aspect on a company's enhancement in an e-commerce business is vital, as a website offers a communication route between the seller and the consumer while also playing a crucial role in shaping and demonstrating consumer happiness. The quality of website design significantly impacts users' assessments of the extent to which website features cater to their demands. Consequently, these assessments serve as a reflection of the comprehensive online experience offered by the website. An e-commerce company's success depends on the criticality of effective website design. Website design encompasses various aspects of the consumer's experiences on an e-commerce website, including technical and graphical components, pricing options, and personalized website service. As per,[12] assessing website quality involves evaluating website navigation, visual appeal, and aesthetics. In[4] study, the concept of website design quality encompasses aspects including navigation, information search, aesthetics, product and price offerings, and personalization. The challenge of determining the website design quality of different product segments and cultures persists. Lastly, the website design quality research is evaluated in Indonesia, America, and Taiwan, yet it still needs to be improved in other countries. Thus, the study fulfils the gap and focuses on website design quality with product segments, such as apparel purchase categories.

Website Design Quality (WDF-EC) And Functional Benefits (FB-EC): Functional benefits refer to the practical and technical advantages that customers experience when using a specific product or service while shopping. Functional benefits are also referred to as utilitarian benefits. The predominant driving force behind online shopping or shopping completed over the internet is primarily rooted in utilitarian purpose.[14] identified and presented a comprehensive list of nine utilitarian motives derived from a sample of online users. The motives are as follows: The factors influencing consumer behaviour in online shopping include information quality and customization, which are website design attributes. Customization is also known as personalization. Personalized content gives usefulness and convenience to customers. A website's aesthetic quality has a crucial role in shaping users' perceptions of its utility and ease of use. Past studies demonstrated that the price attribute is a significant determinant of utilitarian motives. Therefore, it is clear that website design dimensions impact the functional perspectives in e-commerce shopping. The above studies clearly state utilitarian motives, but no clear evidence regarding functional benefits exists. Also, prior research has employed various measures of website design quality, including[1,11,4]. Each of these studies stressed that website design quality provided by a web-based businesses must be addressed primarily.

Consequently, a significance was expected among website design quality and functional benefits. More attention should be given to associations between website design quality and functional benefits. Though[15] analyses website design quality on functional benefits, it is limited only to online tourism sector. Also, Chen quotes, "Users with various needs may have varied perspectives on the benefits." Thus, there is a need to study the relationship between these variables in different contextual environments. Hence, as per the literature review given above, the hypotheses are listed.

H1 (WDF-EC) is positively associated with website aesthetics (WA-EC) in e-commerce apparel websites.
H2 (WDF-EC) is positively associated with website personalization (WP-EC) in e-commerce apparel websites.
H3 (WDF-EC) is positively associated with price offerings (PO-EC) in e-commerce apparel websites.
H4 (WDF-EC) positively associates with respect to functional benefits (FB-EC) in e-commerce apparel websites.

METHOD
The research method is the structural framework guiding the researcher's research activities. Research

methodology is a structured technique to tackle and solve research challenges. The research methodology evaluates the regular methods researchers use while researching a research problem and the fundamental logic behind these activities. An investigator must possess expertise not only in research methods and procedures but also in methodology.

The present investigation is descriptive; the word "descriptive research study" refers to various survey research techniques used to understand better the views, behaviors, and preferences of the target audience. A wide range of investigations fall under the category of descriptive research, which aims to provide audiences with a thorough grasp of the many phenomena under investigation. The phenomena above encompass studies on website design attributes, such as aesthetics, personalization, price offerings, and functional benefits of e-commerce apparel consumers.

The investigator used various materials, including books, journals, newspapers, records, open critiques, and statistics reports. The researcher applied various academic research articles and studies to develop a theoretical framework and determine the connections between variables. The present investigation adopts a primary data collection methodology: the questionnaire. A well-organized survey was designed for data collection to ensure the study framework's validity. The questionnaire's sections explicitly encouraged responders to express themselves voluntarily. The questionnaire for this study was created using a 5-point Likert scale, which ranges from 1 for "Strongly Disagree" to 5 for "Strongly Agree," as utilized in many other studies. The questionnaire scale development has been modified to fit the particular research situation, and all of the variables used are drawn from the body of existing literature. Table 1 explains the adopted and modified measurement sources.

Table 1. Measures of the research			
S.No	Variable lists	NO of items	Adopted and modified measurement sources
1	Website Aesthetics	8	[16], [1]
2	Website Personalization	7	[17], [11]
3	Price Offerings	6	[1], [16]
4	Functional Benefits	5	[18], [19]

The development of online shopping sites has experienced significant growth in recent years, primarily attributed to the expansion of the e-commerce apparel industry. Consumers, especially those residing in developing countries, are highly aware of the potential benefits of e-commerce websites. In the context of India, the practice of online purchasing is now in its developmental phase. Consumers in this region need to be more apprehensive about online retailers and the overall benefits of e-commerce shopping. The research objectives would focus on people within the Indian community, specifically those residing in the Karnataka division, who have engaged in online purchases or have consistently utilized e-commerce websites. Statista 2023 projects that 394 million Indians will be involved in the apparel sector by 2027. Reportedly, Karnataka is one of the states with the highest internet-based purchasing orders (Trade Council Promotion of India 2022). Karnataka's big city of Bengaluru plays a significant role in the state's e-commerce expenditures. As per IBEF 2022, Karnataka tops the list of India's leading centers for e-commerce apparel shopping.

Hence, the sampling employed in the research is "purposive sampling." Thus, the researchers incorporated a demographic profile key question into the survey, which asked participants about their frequency of e-commerce apparel shopping. The present randomization process has enhanced the purposive nature of data collection.

The research emphasized the importance of sampling size. According to the smart-pls analysis, the recommended range for sample size is between 150 to 400 individuals. It is worth noting that the sample size is also influenced by the no. of factors included in the research. The validity of the content in the structured questionnaire has been assessed by five industry experts in e-commerce who possess extensive experience in the field of e-commerce website research. The location of the study has yet to be specified to maintain neutrality. It was also assessed by five industry practitioners with high expertise in implementing websites. Both groups concur that the questionnaire items are simple and easily comprehensible. Since groups of experts have reached a consensus that the research questionnaire is straightforward to understand, the validity of the content and the factors has been proven. Therefore, the questionnaire can now be distributed to the respondents.

The assessment of the questionnaire's reliability is carried out through a pilot study. The following steps were implemented during the pilot study: The instrument's structure, configuration, and sequence nearly mirrored the ultimate structure. A survey study was undertaken with an audience consisting of 120 consumers who make frequent use of e-commerce apparel websites. The current investigation utilized predefined measuring items to evaluate several aspects of websites, such as aesthetics, website personalization, price offerings, and functional benefits. This study finalizes a sample size of 500 to enhance the reliability and validity. The research examined the survey methodologies to gather data via survey responses — the data collection period spanned

from May 2022 to Jan 2023. Among the 575 responses received, it was observed that 75 participants disagreed with the screening question. Respondents were given a Google form with a version of the questionnaire, an explanation of the study's goals, and a promise of privacy and anonymity.

Based on the research objectives, this study should have considered the responses of those lacking prior experience with e-commerce apparel shopping. The final sampling size for this study consisted of 500 complete responses, following the exclusion of 75 non-participating respondents.

These 500 complete responses are from apparel consumers with e-commerce accounts in Flipkart, Myntra, Snapdeal, Nykaa Fashion, and Amazon, who participated in the study and comprised the study population. The useable sample involved 55 % women and 45 % men. The age range of 75 % of the participants was 15–25 years old. The participants' marital status is 45 % married and 55 % single. The education qualification of the participants is primary; 49 % were undergraduates. The participants' occupations are classified into private, public, professional, self-employed, and student. 54 % of the participants were working public and private sector employees with e-commerce accounts. The income range of the participants was between 10,000INR to 50,000INR and above.

Generally, the screening procedure is essential in every research before data analysis. Data screening may uncover specific progressive issues in the data set that could skew the analysis findings. The statistical procedure known as (CFA) Confirmatory Factor Analysis, which outlines before the framework of Structural Equation Modelling (SEM). The main objective is to analyze measurement approaches, which include studying the connections between observable indicators and hidden variables or factors. The main goal of latent variable measurement models, particularly factor analysis, is to ascertain the total number and qualities of factors that account for the variation and links found among a set of indicators. Hence, a CFA measurement framework provides a more comprehensive understanding of the connections between indicators because the number of factors is fewer than the number of measured variables. In addition, CFA is a technique commonly employ to determine the validity of a factor model, assess the correlation between a set of factors, and evaluate the convergent and discriminant validity.

Also, the study cross-checks the reliability with PLS-SEM software.[21] says there are two different ways to look at and understand the PLS model. One way to figure out the best way to measure something is to use outer loadings to see how true and reliable the variables are. The second one is the structural model, which tests how strong and direct the suggested links are among the investigation's variables. The research applied the Smart PLS software to perform the structural model (PLS-SEM) analysis. Structural modeling using Partial Least Squares (PLS) is appropriate for an exploratory investigation, like the one mentioned, due to its ability to reveal predictive causal connections among variables. The technique known as PLS-SEM is appropriate for the research since it enables us to assess the convergent of the factors in the framework. The PLS-SEM method can handle complex structures without imposing excessive constraints on the data's distributional framework.

The subsequent steps are adopted for the PLS assessments. The algorithm was programmed to end after a maximum of 300 iterations. The initial weight was set to 1, as proposed.[20] The diagram illustrating the path model observed in figure 2. The R2 coefficient of the endogenous latent components is essential for comprehending the structural model.

Therefore, the present investigation used Smart PLS v4 to assess the relationship between constructs while examining the data.

RESULTS AND DISCUSSION

The present investigation relied upon convergent validity and reliability testing to evaluate the measurement model. The researcher employed (CFA) using PLS v4 to validate every single measure. The desirable value, as reported,[22] is a suggested level of 0,7 or above. The Cronbach's alpha levels for all the research range from ,962 to ,990, above the threshold. In the context of convergence validity, the researcher investigates the degree of similarities between operationalizations that are expected to be comparable based on theoretical grounds. The composite reliability (CR) values vary between 0,962 and 0,992, while the average variance extracted (AVE) spans from 0,846 to 0,951. The minimum acceptable values for CA and composite reliability should be above 0,7, while the Average variance extracted should be above 0,5. These values indicate that the research model is reliable and effective. The findings presented in table 2 demonstrate that there are no issues regarding the accuracy and consistency of the data, therefore making it suitable for conducting structural assessment.

Table 2. Validity and reliability evaluation				
	Cronbach's alpha (CA)	Composite reliability (CR) (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
WA-EC	0,968	0,970	0,973	0,821
WP-EC	0,960	0,962	0,967	0,807
PO-EC	0,962	0,966	0,970	0,846
FB-EC	0,990	0,992	0,991	0,951
Note: WP-EC = Website Personalization; WA-EC = Website Aesthetics; PO-EC = Price Offerings; FB-EC = Functional Benefits				

The researcher used discriminant validity, as opposed to convergent validity, to determine how far an operationalization departs from others that, theoretically, shouldn't be similar. The identification validity was assessed using a trio of approaches. The most effective method for determining discriminative validity, as described,[23] involves connecting the correlation of different parameters with the square root of the average variance extracted. The second step was to validate the connections by running item and cross-loading analyses on the factor items. Lastly, discriminant validity is ascertained by calculating the heterotrait-monotrait (HTMT) table.

The discriminative validity is presented in table 3.

Table 3. Fornell and larcker table				
	FB-EC	PO-EC	WA-EC	WP-EC
FB-EC	0,975			
PO-EC	0,317	0,920		
WA-EC	0,268	0,305	0,906	
WP-EC	0,322	0,244	0,172	0,898
Note: WP-EC = Website Personalization; WA-EC = Website Aesthetics; PO-EC = Price Offerings; FB-EC = Functional Benefits				

Based on the study conducted,[23] the square root of the average variance extracted (AVE) should be greater than the value of the correlation among the latent constructs. This confirms the discriminative validity of the chosen constructs. Table 3 demonstrate superior discriminant validity. Based on these findings, the researcher concludes the selection of tools is not hindered by reliability and validity.

Various research has employed cross-load assessment standards to assess the flaw of discriminant validity; In accordance with the literature, it is recommended to load items at a higher position than their corresponding structure. The cross-loadings for all related variables are presented in table 4. These findings demonstrate that the factor item values are superior to the cross-loading values of other latent factors. This suggests that the factors have sufficient discriminant validity, as the cross-loaded items criterion is met.

Table 4. Cross loadings with factors				
Construct	FB-EC	PO-EC	WA-EC	WP-EC
FB1	0,995	0,315	0,276	0,32
FB2	0,991	0,315	0,259	0,322
FB3	0,960	0,339	0,253	0,338
FB4	0,933	0,261	0,242	0,274
FB5	0,982	0,311	0,277	0,313
FB6	0,989	0,310	0,261	0,312
PO1	0,277	0,937	0,297	0,231
PO2	0,252	0,934	0,259	0,212
PO3	0,310	0,761	0,259	0,201
PO4	0,329	0,963	0,324	0,240
PO5	0,300	0,957	0,285	0,219
PO6	0,286	0,951	0,255	0,239
WA1	0,247	0,295	0,835	0,146
WA2	0,234	0,272	0,935	0,133
WA3	0,230	0,263	0,955	0,162
WA4	0,258	0,272	0,910	0,159
WA5	0,239	0,207	0,823	0,173
WA6	0,278	0,342	0,921	0,175
WA7	0,237	0,277	0,934	0,160

WA8	0,218	0,272	0,924	0,137
WP1	0,314	0,204	0,171	0,857
WP2	0,301	0,22	0,163	0,954
WP3	0,265	0,218	0,125	0,923
WP4	0,271	0,184	0,155	0,859
WP5	0,311	0,272	0,166	0,883
WP6	0,304	0,253	0,171	0,967
WP7	0,255	0,172	0,125	0,836

Note: WP-EC = Website Personalization; WA-EC = Website Aesthetics; PO-EC = Price Offerings; FB-EC = Functional Benefits; Highlighted ones are factor loadings.

In order to quantify the aforementioned criteria, the HTMT table test was developed. The HTMT table does not has a value near to 1, which suggests that the path analysis shows discriminative validity. HTMT computes the correlation between factors, specifically the upper limit. To achieve a clear differentiation between two components, the value of HTMT should be below 1, as stated.[24] Thus, the research investigation, explains the HTMT ratio. Table 5 displays a minimum value of 0,761, which falls below the specified criterion. This suggests that the investigation's discriminatory validity is within the threshold.

Later, an assessment was implemented to evaluate the reliability, convergent validity, and discriminant validity of the study model. This assessment aimed to test the hypothetical link between the variables. The research uses Smart PLS v4 software. Figure 1 displays the path analysis assessment, which are also presented in table 5.

The path analysis findings indicate a positive correlation between WDF-EC and FB-EC, with a coefficient of b=,433. The beta coefficient of WDF-EC has a positive association with PO-EC, with a coefficient value of b=,728. There is a clear and positive correlation between WDF-EC and WA-EC. Lastly, WDF-EC positively correlates with WP-EC with beta value 0,690.
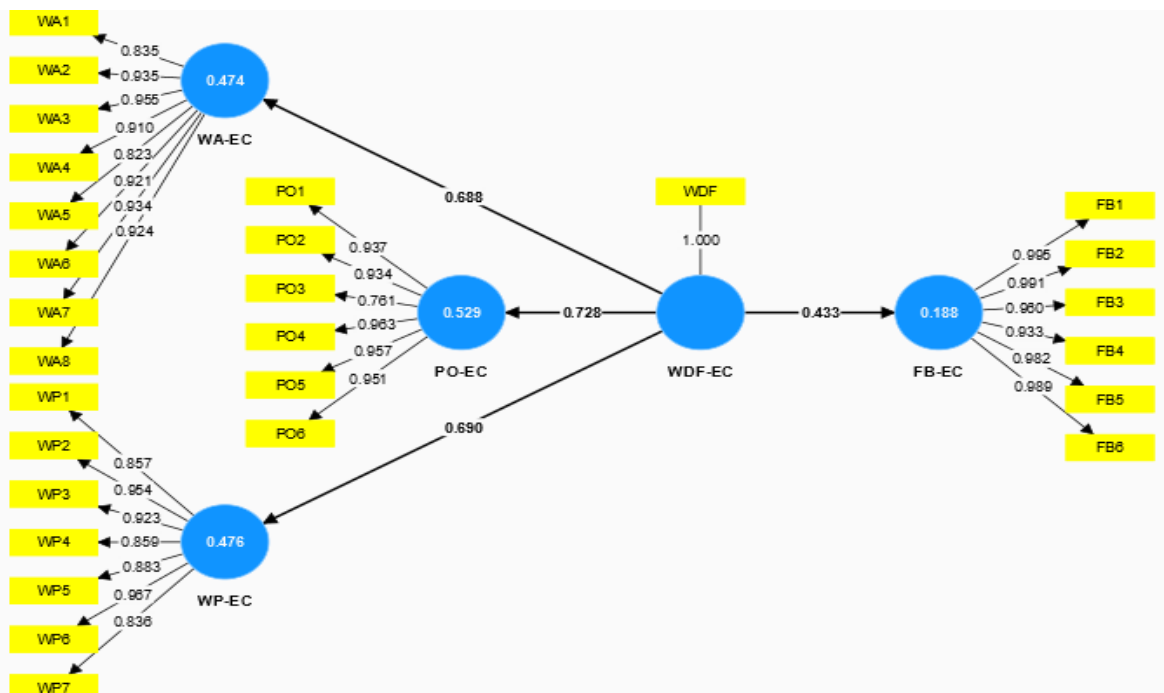

Figure 1. PLS-SEM Results

Table 5. PLS-SEM Results					
Hypothesis	Original sample (O)	Mean (M)	(STDEV)	T values (|O/STDEV|)	P values
WDF-EC -> WA-EC	0,688	0,689	0,025	28,005	0
WDF-EC -> WP-EC	0,690	0,689	0,029	23,914	0
WDF-EC -> PO-EC	0,728	0,727	0,023	32,104	0
WDF-EC -> FB-EC	0,433	0,434	0,041	10,571	0

Note: WDF-EC = Website design quality; WP-EC = Website Personalization; WA-EC = Website Aesthetics; PO-EC = Price Offerings; FB-EC = Functional Benefits; Highlighted ones are factor loadings

The bootstrapping approach, which applies 5,000 iterations, was implemented to determine the degree of significance for the path evaluation.[25] The significance levels are shown by the bootstrap estimates, which are shown in figure 2.

In the present study, the researcher utilised R square to evaluate the predictive capacity of the model. The PLS technique in Smart-PLS was utilised to calculate the R square values. The R-square values were found to be 0,188 for FB-EC, 0,529 for PO-EC, 0,474 for WA-EC, and 0,476 for WP-EC. These R-square values are considered acceptable because they greater than the limit of 0,10 commonly used in social sciences.
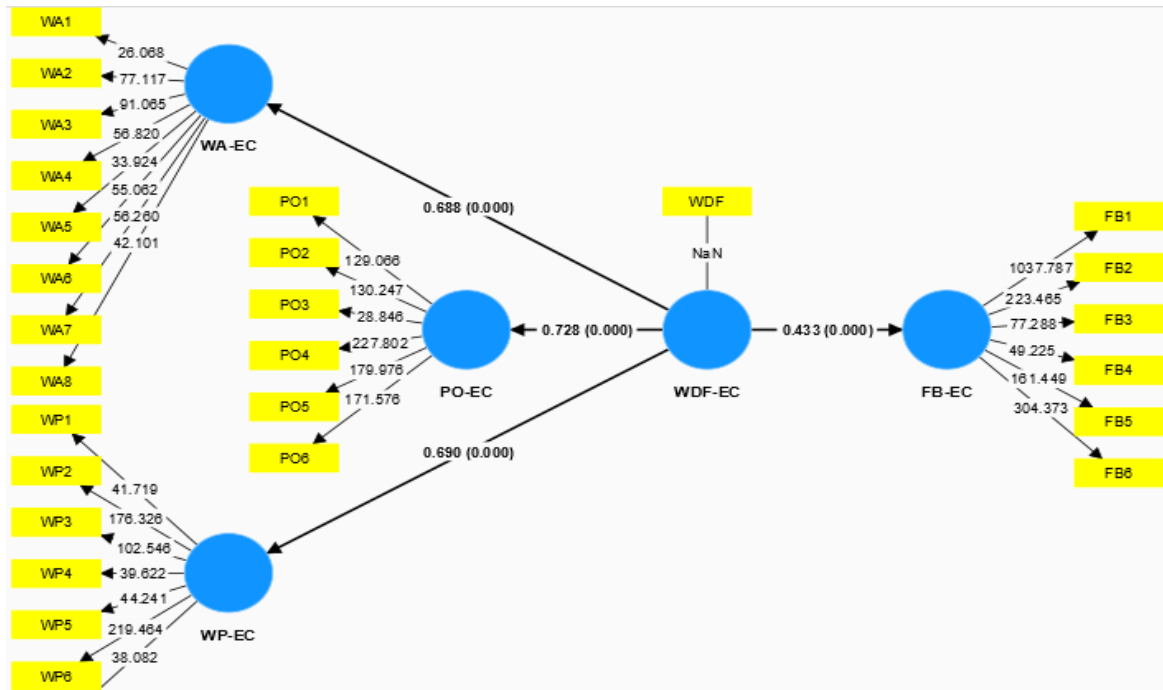

Figure 2. Bootstrap approach results

The findings shown in table 5 illustrate the explicit correlation between the identified constructs. The hypothesis suggests that WDF-EC has a positive effect on WA-EC within the e-commerce apparel sector. The structural equation modelling analysis shows a statistically significant beta coefficient of 0,688 for the path between WDF-EC and WA-EC, with a p-value of 0,000. The findings demonstrated a significant influence of WDF-EC on WA-EC and confirmed the hypothesis H1 (WDF-EC->WA-EC). Indian citizens prioritise the WDF-EC (Website Design Quality) and the aesthetics of apparel websites when purchasing apparel services. Some individuals believe that e-commerce apparel platforms should prioritise the development of visually appealing websites in order to enhance the user-friendliness and overall experience of e-commerce apparel websites. In recent years, there has been an increasing focus on personalizing apparel items and web-based services. It is crucial for marketers to comprehend customers' preferences in order to provide appropriate suggestions for apparel product items and services. Thus, the present investigation assesses the correlation between WDF-EC and WP-EC. The current study aimed to assess the correlation between WDF-EC and WP-EC of e-commerce apparel platforms. The investigation was directed by a theoretical framework. The results demonstrate the presence of a significant and positive correlation between WDF-EC and WP-EC, thus establishing the existence of this relationship. The path analysis reveals a correlation coefficient of 0,690 at the p-value of 0,000 between WDF-EC and WP-EC. The findings demonstrated that website personalisation is a significant influence in the realm of e-commerce apparel websites in India. The acceptance of H2 (WDF-EC->WP-EC) has been confirmed. This study proposed a direct relationship between WDF-EC and PO-EC on e-commerce apparel websites. The results demonstrate a noteworthy and positive association between the WDF-EC and PO-EC. The path coefficient is 0,728, with a p-value of 0,000, which provides evidence to support the hypothesis of H3 (WDF-EC->PO-EC). The above results are in align with.[1,4] Lastly, the design aspects of a website (WDF-EC), including colour, fonts, personalisation, and price offerings, can enhance the overall quality of the website, leading to significant increases in its functional benefits (FB-EC). Earlier research findings are supported by the recent finding of a significant positive effect of WDF-EC on FB-EC. The correlation coefficient between WDF-EC and FB-EC is 0,433, which is statistically significant with a p-value of 0,000. The findings indicate that enhancing WDF-EC would result in the enhancement of FB-EC within the e-commerce apparel business in India. Therefore, researchers support hypothesis H4 (WDF-EC->FB-EC).

CONCLUSION

The WDF-EC is crucial for the survival of many businesses, particularly in the context of purchasing apparel online, where the WDF-EC of the e-commerce platform plays a vital role. Hence, the research focuses to ascertain the variables that influence the WDF-EC of e-commerce, finally resulting in FB-EC. This study expands upon the Means End Chain model by emphasising the significance of discussing values in regard to FB-EC. If the customer is disappointed with the quality of website design, they will perceive the apparel websites as unhelpful and inconvenient for making apparel purchases. This study examines the dimensions of WDF-EC (Website design quality in E-commerce) in apparel websites, specifically WA-EC (Website Aesthetics in E-commerce), WP-EC (Website Personalization in E-commerce), and PO-EC (Price Offering in E-commerce). The study also investigates the impact of these dimensions on FB-EC (Functional benefits in E-commerce), based on a comprehensive assessment of existing literature. The proposed approach was evaluated using Partial Least Squares Structural Equation Modelling in smart-PLS v4. The data used for analysis was collected through a structured survey conducted among customers of e-commerce apparel websites in India. The analytical findings demonstrated that all of these factors are valuable indicators of WDQ-EC. Moreover, the research revealed a robust correlation between WDF-EC and PO-EC. The creation of WDF-EC in the customer's perception can be achieved through enhanced PO-EC. The process of purchasing apparel products through online shopping can be influenced by WDF-EC, which in turn impacts FB-EC, as observed in this study. This study also draws conclusions regarding the implications and prospects for the future on the basis of the data.

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CONFLICT OF INTEREST
None.

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Writing - revision and editing: P. Krithika, S. Vasantha.