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# **Online Marketing Trends and Purchasing Intent: Advances in Customer Satisfaction through PLS-SEM and ANN Approach**

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## **Abstract**

**Purpose** - The research aims to discern the factors of online marketing that influence consumer intention and enhance satisfaction, particularly in Bangladesh.

**Methods** - The study uses quantitative data, targeting respondents from urban areas and cities from various socio-economic classes. This study uses a two-stage structural equation modeling-artificial neural network approach. Initially, the analysis utilized the PLS-SEM method to assess the structural model. Finally, the analysis used the ANN approach to check the robustness of the findings.

**Results** - The study's findings reveal that convenience, comparison, ease of use, and variety-seeking significantly influence customer satisfaction in online shopping. Conversely, promotional activities and customer service were found to have less impact on customer satisfaction. Customers anticipate prompt and efficient service, and a failure to meet these expectations can strain the customer-seller relationship.

**Practical implications** - This study presents an alternative business model without needing physical store visits. However, despite the growth of internet technology in Bangladesh and its potential to provide products and services at lower costs, convincing customers to shop online remains a challenge for online traders.

**Originality** - This research offers a unique perspective on the dynamics of online marketing and consumer satisfaction in Bangladesh, shedding light on the factors that drive or deter online shopping in a developing nation using the two-staged SEM-ANN approach. This provides actionable knowledge for decision-makers in online service provision, aligning with the quantitative methodology's characteristic of Decision Sciences.

**Keywords:** Online Marketing, Brand Promotions, Consumer Satisfaction, Purchasing Intention

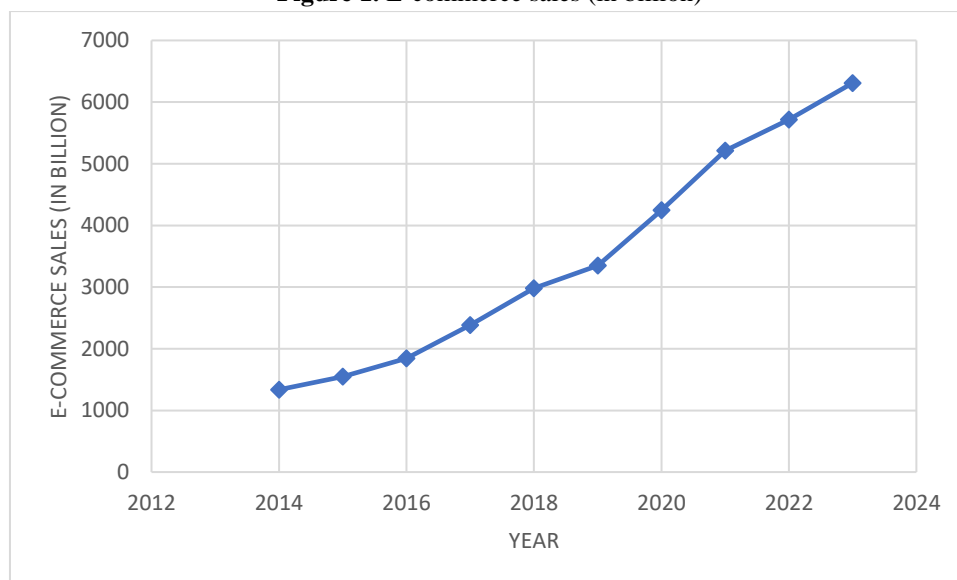
**JEL:** M30, M31, M37, C39, J28.

## 1. Introduction

Consumer behavior has long been a focal point for marketing professionals and has experienced a notable evolution over the past five decades (Kotler, 1977; MacInnis & Folkes, 2010). The seminal work of Kotler, et al. (2001) delineates consumer buying behavior as a comprehensive process elucidating how individuals, groups, and organizations engage in the selection, acquisition, utilization, and disposal of products, services, ideas, or experiences to fulfill consumer demands. In light of contemporary modes of procurement and communication, such as online shopping and advertising, there has been a resurgence of interest in evaluating consumer behavior.

Online shopping, a manifestation of electronic commerce, facilitates consumers' acquisition of products or services directly from vendors via the Internet (Mudaa, et al., 2021). Referring to Figure 1, the landscape of retail e-commerce witnessed substantial growth, reaching nearly \$506 billion compared to the preceding year (Vyas, et al., 2023). This underscores the profound impact of evolving technologies on consumer behavior and the burgeoning significance of online platforms in shaping contemporary commerce.

**Figure 1.** E-commerce sales (in billion)



Source: <https://www.statista.com/statistics/379046/worldwide-retail-e-commerce-sales/>

Katawetawaraks and Wang (2011) deliberated on the nuanced behavioral patterns arising from online shopping, delineating a complex interplay of factors among consumers. This digital retail platform has notably expanded the array of preferences and information available to contemporary consumers who seek heightened convenience and expediency in their transactions. However, the absence of tangible interaction with the product before purchase has instilled skepticism among consumers, leading to reservations about the online shopping experience.

The Economic landscape has disclosed a substantial augmentation in the market size of e-commerce in Bangladesh. Notably, this expansion signifies a growing reliance on digital

platforms for commercial transactions. Furthermore, despite the predominantly digital nature of most e-commerce enterprises, a discernible trend is emerging among executives who are actively reassessing and restructuring their business models to incorporate digital media and electronic payment mechanisms seamlessly. This strategic adaptation underscores the evolving nature of businesses to align with the changing dynamics of the digital economy.

The e-commerce sector has witnessed a sustained growth trajectory in recent years, with projections indicating a prospective expansion exceeding 17.61% in the forthcoming years. As reported by the e-Commerce Association of Bangladesh (e-Cab), the current landscape is characterized by approximately 700 e-commerce sites, complemented by an additional 8,000 e-commerce pages on the Facebook platform (Vyas, et al., 2023). Notably, Facebook persists as a prevalent avenue for product advertising and sales, prompting a discernible trend wherein numerous businesses are opting to forego the establishment of dedicated websites. Within the Bangladeshi context, these 700 e-commerce entities strategically target an extensive online audience, encompassing 184.44 million internet users, 44.7 million Facebook users, and 176 million mobile users as of the recent year (Vyas, et al., 2023). This underscores the pervasive reach and influence of e-commerce within a digitally interconnected society. The prevalent e-commerce categories in Bangladesh span a diverse spectrum, including Online Retail Stores (e.g., Ekhanei.com, bagdoom.com, Kaymu.com), Food Delivery Stores (e.g., Foodpanda.com, Hungrynaki.com), Grocery Stores (Chaldal.com), E-ticket platforms (BusBd.com), Online Car Marketplaces (Carmudi.com), and Online Real Estate Markets (Lamudi.com). This sectoral diversification underscores the adaptive nature of the market, catering to a myriad of consumer needs and preferences.

Within the developmental context of Bangladesh, it becomes imperative to scrutinize the factors shaping online shopping behavior and the necessity of gauging consumer satisfaction. Akroush and Al-Debei (2015) assert that in the modest economic conditions characteristic of developing nations, convenience is pivotal in influencing consumers' attitudes toward online shopping. This, in turn, correlates with reduced product prices and heightened sales in online retail spaces. The prevailing trend in Bangladesh underscores a proclivity among consumers to engage in value-driven transactions through e-commerce platforms.

In the milieu of developing economies, typified by a general inclination towards risk aversion, the construct of trust emerges as a decisive factor shaping individuals' perspectives on online shopping. Trust levels are intricately linked to users' experiences with a website and endorsements from trusted sources regarding the perceived benefits and value propositions inherent in online transactions (Akroush & Al-Debei, 2015). The burgeoning domain of online marketing, serving as a facilitator of enhanced convenience, witnesses an uptick in activity during cultural festivities such as Eid and puja. Modalities like cash-on-delivery persist, with contemporary options like credit or debit card payments gaining traction. Furthermore, the pervasive influence of the popular social network Facebook is evidenced by the increased prevalence of buying and selling activities, with numerous stores and fashion houses establishing a virtual presence on the platform.

The geographic expansion of online shopping from Dhaka to Chittagong, Sylhet, Rajshahi, and other major urban centers indicates widespread adoption. Despite this growth, pertinent data storage systems to comprehensively capture the landscape of online shopping activities are notably absent, both within governmental and private spheres. According to the Bangladesh Association of Software and Information Services (BASIS), the prevailing mode of transaction for most shoppers in Bangladesh remains cash-based, with a mere one to two percent of internet users engaging in online buying and selling activities. This underscores the nascent stage of online commerce adoption and highlights the gap between technological capabilities and consumer behavior in Bangladesh.

While there has been extensive exploration into consumer behavior and the rise of online shopping globally, there remains a significant lacuna in understanding the nuanced factors of online marketing that influence consumer intention and satisfaction within developing countries (Chu, et al., 2021; Nguyen, et al., 2022). Most existing studies have been anchored in the context of developed markets, often overlooking emerging economies' unique dynamics, challenges, and opportunities. Specifically, the intricacies of online consumer behavior in the context of Bangladesh, a rapidly growing digital market, have not been comprehensively addressed. This gap signifies a missed opportunity to understand the diverse landscape of global e-commerce and the varied factors that drive consumer satisfaction across different socio-economic and cultural contexts. Against the backdrop of Bangladesh's evolving e-commerce landscape, this study delves into the intricate dynamics of consumer behavior in online shopping. By employing robust quantitative techniques, particularly PLS-SEM, our research aligns with Decision Sciences, aiming to unravel the complexities that inform strategic decision-making for online service providers navigating this dynamic marketplace. In this study, the main objective is to find out the most influential factors of the online shopping attitude of the customers and find the satisfaction level of the consumers in Bangladesh perspective by answering the following questions:

1. How does the convenience factor influence consumer buying intention?
2. How does the comparison factor impact consumers' buying behavior?
3. How do consumers perceive the customer service response from online retailers?
4. How does the ease of use of online shopping affect consumers' attitudes?
5. How do consumers view variety-seeking options of online shopping?
6. How do e-commerce promotion strategies strike consumers' minds?

This study significantly enriches the existing literature on online shopping behaviors, offering multiple contributions and integrating appropriate ANN frameworks could enrich the methodological rigor while delivering practical strategic value (Nguyen, et al., 2022; Vinh, et al., 2023; Wang, Sohail, et al., 2023). Firstly, it brings to the fore the unique dynamics of Bangladesh, an emerging market often overshadowed by global e-commerce research. This regional specificity provides a fresh lens to understand the preferences and challenges inherent to consumers in developing nations. Secondly, our study adopts a holistic approach, encompassing various facets of online shopping, from convenience to the intricacies of

promotional strategies. This breadth ensures a nuanced grasp of the diverse factors steering consumer behavior. On a practical front, the insights gleaned can serve as a strategic compass for e-commerce platforms, marketers, and policymakers in Bangladesh, enabling them to fine-tune their offerings to resonate with local tastes and demands. Lastly, on a theoretical plane, our study augments existing frameworks on online consumer behavior. By introducing and validating constructs tailored to the Bangladeshi milieu, the study sets the stage for subsequent research in analogous emerging markets, fostering a richer, more global comprehension of e-commerce trajectories, including artificial neural network (ANN), a branch of machine learning approach.

## **2. Literature Review and Hypothesis Development**

### ***2.1. Convenience and Consumers' Purchase Decisions in online shopping***

Convenience is a crucial factor in online shopping that can significantly influence consumers' purchasing decisions. With the ability to shop from anywhere, anytime, and have items delivered to your doorstep, online shopping has become a popular choice for many consumers. Plus, features like fast and free shipping, easy returns, and secure payment options add convenience. Online sellers prioritizing convenience in their services will likely attract more customers and generate more sales. Fadhilla and Farmania (2017) recognized relationships between trust, convenience, and purchase decisions in online shopping in Indonesia. For some services like air ticket booking and travel plans, this service has undoubtedly become the most favored source of purchase due to convenience. Sari and Rahmiati (2022) determined the direct and indirect effects of convenience, trust, and security on customer satisfaction through the Tokopedia online store purchase decisions. Baabbad (2022) identified the impact of trust, convenience, and information quality on consumers' online purchase decisions. Data processing was performed using multiple linear regression with non-probability sampling, using judgmental sampling on a sample of 100 respondents (Liao, et al., 2012; Rasidi & Tiarawati, 2021). Based on the above literature, the study proposes the following hypothesis

**H1.** The convenience of online shopping has a positive relationship with consumer satisfaction.

### ***2.2. Comparison and Consumers' Purchase Decisions in Online Shopping***

Consumers themselves indeed differ from each other. Some are more price-sensitive, others are more anxious about product features, and others pay more attention to after-sales service. These differences may also influence consumer preferences and the frequency of online shopping. Therefore, another issue that deserves thorough investigation is how online shopping experiences may affect their online shopping patterns (Kwak, et al., 2002). Despite the prevalent use of comparison shopping among online consumers, there exists a lack of research differentiating the characteristics of comparison shoppers from those who abstain from this practice. Klassen, et al. (2009) conducted a survey involving 208 US consumers, explicitly targeting individuals who engaged in comparison shopping, both in online and

offline contexts. The research discerned that comparison shoppers exhibit a more favorable attitude toward online shopping when compared to their non-comparison counterparts. This inclination is underpinned by the perceived cost-effectiveness, convenience, and belief in the superior benefits and broader selection offered by online shopping compared to traditional methods.

Furthermore, comparison shoppers have a more positive disposition towards online shopping due to its convenience and simplicity. This nuanced exploration sheds light on the distinct consumer attitudes associated with comparison shopping. It emphasizes the multifaceted considerations contributing to a more favorable perception of online retail platforms among individuals actively engaging in comparative analysis during their shopping experiences. Kidane and Sharma (2016) investigated the merchant selection criteria of online shoppers and their likelihood of continuing to use comparison sites. One of the interesting findings from their study is marketers need to have strong web rankings and brand awareness to reach a broad online market. This finding dispelled the notion that e-shop sellers presented by comparison shopping sites must compete only on price. Kidane and Sharma (2016) suggested that retailers use communication networks that are easier for consumers to understand. They should provide information to help buyers make comparisons and logical decisions in the purchasing process. From the research papers discussed above, this study can suggest the following hypothesis:

**H2** Comparison has a positive relationship with consumer satisfaction.

### ***2.3. Customer Service and Consumer Purchase Decisions in Online Shopping***

The dynamic evolution of the internet landscape has engendered a highly competitive business environment, presenting lucrative prospects for online commerce. The advent of sophisticated online operational systems facilitates customers in procuring and transacting payments for various products and services through internet platforms (Sevilla, et al., 2019). The prevalent trend of customer engagement in online shopping underscores its increasing significance. Nevertheless, navigating the intricate e-commerce landscape is compounded by diverse individuals and cultures harboring distinct perspectives. Consequently, e-commerce enterprises confront the challenge of deciphering complex consumer behavior (Kotler, 2005). Recognizing this complexity, it becomes imperative to discern the cultural and societal factors influencing consumers' purchasing decisions, enabling businesses to navigate the nuanced market intricacies with greater understanding.

Kidane and Sharma (2016) research delves into the multifaceted determinants influencing customers' purchasing decisions and satisfaction within online shopping, with a particular emphasis on after-sales service. Elida, et al. (2019) contributed insights indicating that price, product and service information are pivotal variables that significantly impact online consumers' decision-making processes. Notably, service emerges as the paramount consideration for marketers, constituting the most influential variable shaping the online shopping decision-making paradigm. The conceptual framework proposed by Chan, et al. (2003) categorizes factors influencing consumers' online shopping decisions into



uncontrollable elements, including individual consumer traits and environmental influences, and controllable factors, such as product or service attributes, media, and intermediary characteristics. Unobservable independent variables encompassing environment, product, price, service, and transaction security were postulated, with the decision-making process serving as a dependent variable, estimated through methodologies outlined by Kotler (2005). This literature synthesis forms the foundation for formulating hypotheses in the subsequent discourse.

**H3** Customer Service has a positive relationship with consumer satisfaction.

#### ***2.4. Ease of Use and Consumer Purchase Decisions in online shopping***

The advent of the internet has ushered in a new technological era, giving rise to a novel marketing paradigm known as online marketing, designed to streamline various facets of human activities (Suleman, 2018). Online shopping, a pivotal component of this paradigm, refers to how consumers procure products or services via online platforms (Pi & Sangruang, 2011). The determinants of Attitude, Perception of Ease of Use, Usefulness, and Trust play a crucial role in shaping the landscape of online shopping. Consumers leverage the internet to gather product information, compare prices and features, and purchase from preferred online or offline vendors. The pervasive impact of Internet technologies has precipitated substantial changes in contemporary lifestyles, notably influencing the marketing models in business (Çelik, 2011).

Suleman and Zuniarti (2019) investigated the interplay between perceived usefulness, perceived ease of use, and trust concerning attitudes and decision-making in online purchases of fashionable goods. Their findings highlighted that perceived ease of service does not significantly impact consumer purchase decisions, while perceived usefulness and trust emerge as influential factors. Rachmawati, et al. (2020) discerned a direct effect of ease on purchasing decisions, though the quality of information exhibited no discernible effect. Artanti, et al. (2019) illuminated the notable impact of viral marketing and perceived ease of use on online purchase decisions, indicating a nuanced and context-dependent role for ease of use that necessitates further scholarly exploration. The culmination of these discussions gives rise to the formulation of hypotheses for subsequent empirical examination.

**H4** Ease of use has a positive relationship with consumers' satisfaction.

#### ***2.5. Variety-seeking and Consumer Purchase Decisions in Online Shopping***

In consumer behavior, individuals often exhibit variety-seeking behavior when confronted with various product choices, a phenomenon characterized by selecting products from different categories (Kahn & Louie, 1990). To cater to diverse consumer needs, businesses must identify and track the most relevant marketing segments (Sevilla, et al., 2019). Variety-seeking behavior, as it pertains to consumption, serves as a valuable criterion for effective market segmentation (Bassnett & Trivedi, 1999). This behavior is typified by individuals switching between products, categories, or brands to mitigate the diminishing returns

associated with repeated purchases or consumption of identical goods (Ratner, et al., 1999). Contemporary observations indicate a proclivity for individuals to switch between options or select different alternatives from a set of choices. Noteworthy contributions from Herrmann and Heitmann (2006), and Shaddy, et al. (2021), delve into pertinent literature within cultural psychology and marketing psychology, providing an overview of consumer perceptions related to variety-seeking behavior. A substantial literature review conducted by Woratschek and Horbel contributes to an enhanced understanding of the antecedents and consequences of variety-seeking behavior in consumption (Woratschek & Horbel, 2003). Building upon this extensive literature, the formulation of hypotheses emerges as a logical next step in advancing our comprehension of variety-seeking behavior in consumer choices.

**H5** Variety seeking has a positive relation with consumers' satisfaction.

## ***2.6. Promotion and Consumer Purchase Decisions Online***

Business organizations employ diverse promotional strategies to influence consumer purchasing decisions (Amin, et al., 2014). Among these strategies, sales promotion, a pivotal element in the promotional mix, is extensively utilized to maintain a competitive edge, boost sales, and stimulate favorable consumer purchasing decisions. This study scrutinizes explicitly the nuanced relationship between various sales promotion tools, encompassing price reductions, coupon discounts, and the provision of free samples with a purchase (Artanti, et al., 2019). Recognizing the pivotal role of promotion in achieving a company's sales goals, it emphasizes the necessity for consumers to have the opportunity to trial or examine the company's offerings to instill confidence in potential buyers, thereby fostering a willingness to subscribe. The study posits that targeted promotion efforts are poised to impact revenue growth positively. From a marketing standpoint, promotion is conceptualized as an ongoing and dynamic process. Through strategic promotional activities, organizations can draw in customers who may not have initially expressed interest in their products or services, ultimately compelling them to purchase (Das, et al., 2016). The study underscores the importance of a promotional mix—a strategic amalgamation of optimal approaches from advertising, personal selling, and various promotional tools—all meticulously planned to achieve the objectives of the sales program.

The influence of social media on online purchasing decisions takes center stage in the work of Artanti, et al. (2019), as they delve into the interplay of viral marketing and perceived ease of use in shaping consumer behaviors. In the context of customer relationship management (CRM), Baabbad (2022) examines the effectiveness of CRM, customer value, perceived online convenience, and customer satisfaction in fostering Shopee customer loyalty, providing valuable insights into the dynamics of customer relationships in the e-commerce domain. Empirical evidence from Suryani and Syafarudin's (2021) investigation reinforces the positive relationship between promotion and purchase decisions. Additionally, the research conducted by Kore, et al. (2018) delves into the effects of promotion, trust, and convenience on the online purchase decisions of IYB Shop consumers, revealing a positive and significant impact of these factors. Drawing on this literature survey, the study

formulates hypotheses to explore further the dynamics of promotion in shaping consumer behaviors.

**H6** Promotion has a positive relation with consumers' satisfaction.

### ***2.7 Artificial Neural Networks for Predicting Online Consumer Behavior***

Newer research was oriented to using artificial neural networks (ANNs) in online consumer behavior prediction. Wang, Wong, et al. (2023) approached the issue of economic analysis model development in the export industries purview, combining ANNs with models of sustainable resource management. Along with this reasoning, ANNs might offer a predictive modeling tool for sustainability planning, using which company executives could learn strategic information about consumer markets and their behavior dynamics.

ANNs can unleash the non-linear relationship among factors affecting customer satisfaction and purchase decisions in online shopping (Iriany, et al., 2022; Jaiswal, et al., 2022; Palanisamy, et al., 2023). Further, integrating ANNs with optimization approaches has provided good control over chaotic datasets of dynamic consumer environments (Magtangol III De Guzman & So, 2018; Mahmood, et al., 2022). Such ANNs can adaptively detect actionable patterns in noisy e-commerce data in emerging markets like Bangladesh (Khoa, et al., 2020).

More advanced ANN models may enhance predictive analytics for online businesses by tracking consumer sentiment, calibrating marketing efforts, and enhancing customer acquisition and retention (de Oliveira Passos, et al., 2020; Yu, et al., 2023). Considering the complexity of the Bangladeshi context regarding purchase drivers, suitable integrated ANN frameworks might enrich methodological rigor even further while providing applicable strategic value.

## **3. Data and Methodology**

### ***3.1. Data Collection***

This research is based on quantitative data, as the primary research objective is to determine consumers' online shopping behavior and satisfaction. The key target respondents of the survey are people from urban areas and in the city. This research includes women and men, the age range is from 18 to 60 years old, and the social status is middle class, middle-upper class, and upper-class people. According to the e-Commerce Association of Bangladesh (e-Cab), there are presently 700 e-commerce sites and around 8,000 e-commerce sites on Facebook. Facebook remains a popular way to advertise and sell products, so many businesses abandon creating a website. In Bangladesh, 700 e-commerce businesses target over 184.44 million internet users, 44.7 million Facebook users, and 176 million mobile users.

To determine the sample size for a survey, Das, et al. (2016) suggested that if the target population is more than 100,000 and to achieve a 95% confidence level, the sample size should be 400. Green (1991) suggested using the rule that  $N \geq 50 + 8m$  (for multiple correlations) and  $N \geq 104 + m$  (for partial correlation), where  $N$  is used for the sample size and  $m$  is the number of independent variables. This study has six independent variables, so according to this rule, the sample size ( $N$ ) should be at least  $50 + 8 \times 6 = 98$ . While Mundfrom, et al. (2005) stated that a sample between 160 and 300 is suitable for a multivariate numerical investigation method. The study received a total of 420 user responses to this research. A structured questionnaire was developed. This questionnaire was prepared to conduct a field survey and collect primary data. This study used a 5-point Likert scale (strongly agree, agree, neutral, disagree, and strongly disagree).

### ***3.2. Data Analysis Approach***

This research used partial least square structural equation modeling (PLS-SEM). PLS-SEM is the suitable statistical methodology for this study due to its particular relevance in assessing complex relationships and causal pathways among variables in the context of online marketing and consumer satisfaction in Bangladesh (Deb, Rahman, & Haseeb, 2023; Deb, et al., 2021; Deb, Rahman, & Rahman, 2023; Rahman, et al., 2023; Rahman & Islam, 2023; Uddin, et al., 2023). PLS-SEM offers several advantages for this research. Firstly, it accommodates both reflective and formative constructs, making it flexible for modeling the multi-dimensional nature of the variables involved, such as convenience, comparison, ease of use, and variety seeking (Hair, et al., 2011). Secondly, PLS-SEM allows for a small sample size, which is particularly valuable in this study as it involves data collected from urban areas and cities in Bangladesh, which may present challenges in obtaining large sample sizes. Thirdly, PLS-SEM provides insights into the strength and direction of relationships, enabling a nuanced understanding of how various factors influence customer satisfaction, which is essential for tailoring effective online marketing strategies. In sum, PLS-SEM is a suitable and robust methodology for unraveling the intricate dynamics of online marketing and consumer satisfaction in a developing nation like Bangladesh, as it can handle the complexities and nuances of the data and hypotheses examined in this research (Deb, Rahman, & Rahman, 2023; Hair, et al., 2011; Uddin, et al., 2023). Finally, the study used artificial neural network (ANN), a branch of machine learning, to check the robustness of the findings.

### ***3.3. Constructs' Operationalization***

The operationalization of constructs in this study draws upon established methodologies and scales from existing literature, ensuring a robust and reliable measurement of the identified factors. The concept of Convenience (CONVT), encompassing ease of navigation and accessibility, is operationalized using a 5-point Likert scale, a common approach in studies assessing user experience in online environments (Akroush & Al-Debei, 2015). The construct of Comparison (COMP) is operationalized through survey questions inspired by previous research exploring consumers' tendencies to compare products and prices during online shopping experiences (Kore, et al., 2018).

To measure Customer Service (CUSRV) quality, the survey incorporates items adapted from established customer satisfaction scales (Artanti, et al., 2019), focusing on responsiveness and helpfulness. The Ease of Use (EU) construct draws from the Technology Acceptance Model (Elida, et al., 2019) and includes Likert scale items assessing respondents' perceptions of website navigation and overall user-friendliness. The Variety Seeking (VAR) construct is operationalized by survey questions inspired by prior literature on consumer behavior and variety-seeking tendencies in online shopping contexts (Herrmann & Heitmann, 2006; Huy Tuu & Ottar Olsen, 2013).

For the construct of Promotion (PROM), Likert scale items are designed based on established models of consumer response to advertising and promotional efforts in the online marketplace (Jahanshahi, et al., 2011; Kore, et al., 2018). Lastly, the operationalization of Customer Satisfaction (SAT) utilizes a 5-point Likert scale, a widely adopted approach in satisfaction research (Hartono & Wahyono, 2018), encompassing aspects such as product quality, delivery speed, and overall shopping experience.

Adopting these sources ensures the alignment of measurement instruments with recognized frameworks in the field, enhancing the validity and reliability of the study's findings. Collectively, these sources contribute to establishing a comprehensive and well-founded methodology for operationalizing the identified constructs in the context of online marketing and consumer satisfaction in Bangladesh.

## **4. Empirical Analysis**

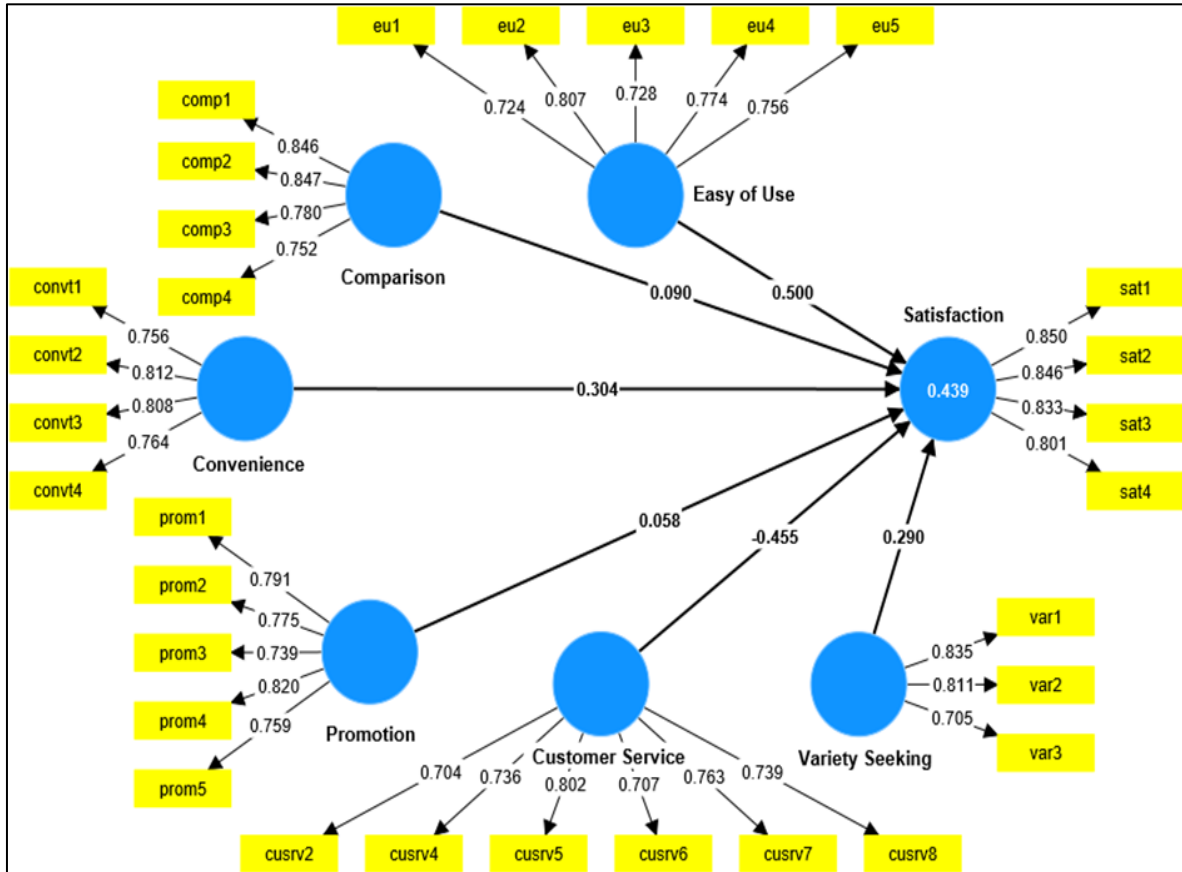
### ***4.1. PLS-SEM Analysis***

#### **4.1.1 Measurement Model**

Figure 2 presents a concise overview of the measurement model employed in this study. The existing measurement model was evaluated based on reliability and validity metrics. Reliability assessment utilized Cronbach's alpha (CA) and composite reliability (CR) to ascertain the dependability of the constructs. Furthermore, construct validity was scrutinized through convergent and discriminant validity assessments to confirm the distinctiveness of the measures for each construct. This comprehensive evaluation ensures the robustness and integrity of the measurement model in capturing and measuring the underlying constructs.

In quantitative data analysis, considering both reliability and validity is paramount to ensure the high quality and accuracy of the collected data for rigorous hypothesis testing. All Composite Reliability (CR) and Cronbach's Alpha (CA) values surpass the recommended threshold of 0.70, with values exceeding 0.82, as established by Hair, et al. (2019). This reaffirms the reliability assumption. Conforming to the criteria set by Fornell and Larcker (1981), the Average Variance Extracted (AVE) values in this study, ranging from 0.552 to 0.693, exceed the benchmark of 0.5, affirming the convergent validity of the variables. A comprehensive summary of the measurement model, including these reliability and validity indicators, is detailed in Table 1.

**Figure 2.** Measurement model analysis



Note: CONVT: Convenience, COMP: Comparison, CUSRV: Customer Service, EU: Ease of use, VAR: Variety Seeking, PROM: Promotion and SAT: Customers' satisfaction. CONVT1, COMP1, etc., are the survey statements through which latent constructs like comparison, satisfaction, etc., are developed.

**Table 1.** Evaluating measurement model using outer loadings, VIF, alpha, composite reliability, and AVE

Variables	Indicators <sup>a</sup>	Outer Loadings	VIF	CA	CR	AVE
Convenience	CONVT1	0.756	1.394	0.793	0.866	0.617
	CONVT2	0.812	1.828			
	CONVT3	0.808	1.674			
	CONVT4	0.764	1.589			
Comparison	COMP1	0.846	1.938	0.822	0.882	0.652
	COMP2	0.847	2.092			
	COMP3	0.780	1.657			
	COMP4	0.752	1.487			
Customer Service	CUSRV2	0.704	1.602	0.809	0.887	0.723
	CUSRV4	0.736	1.720			
	CUSRV5	0.802	1.887			
	CUSRV6	0.707	1.423			
	CUSRV7	0.763	1.792			
	CUSRV8	0.739	1.634			
Ease of Use	EU1	0.724	1.559	0.838	0.881	0.552
	EU2	0.807	1.831			
	EU3	0.728	1.415			
	EU4	0.774	1.763			
	EU5	0.756	1.626			

Variety Seeking	VAR1	0.835	1.523	0.687	0.828	0.617
	VAR2	0.811	1.471			
	VAR3	0.705	1.204			
Promotion	PROM1	0.791	1.736	0.836	0.884	0.604
	PROM2	0.775	1.676			
	PROM3	0.739	1.637			
	PROM4	0.820	2.131			
	PROM5	0.759	1.734			
Satisfaction	SAT1	0.850	1.981	0.852	0.900	0.693
	SAT2	0.846	1.942			
	SAT3	0.833	1.794			
	SAT4	0.801	1.204			

Note: The Kaiser–Meyer–Olkin (KMO) test yielded a high value of 0.912, indicating a robust sampling adequacy for the conducted factor analysis. ‘a’ indicates the statements in the survey. Additionally, Bartlett’s Sphericity (BS) test demonstrated statistical significance ( $p < 0.001$ ), reinforcing the suitability of the data for factor analysis. The internal consistency of the constructs was assessed through Cronbach’s Alpha (CA), ensuring reliability, while Composite Reliability (CR) further confirmed the consistency of the measurement model. Average Variance Extracted (AVE) was employed to evaluate the convergent validity of the constructs. Together, these tests affirm the robustness of the study’s measurement model, providing a solid foundation for the subsequent structural equation modeling analysis.

In the summary presented in Table 1, items CUSRV1 and CUSRV3 were excluded due to their outer factor loadings falling below the threshold of 0.7, even though the generally accepted threshold is 0.5 (Khan, et al., 2019). Beyond reliability and validity assessments, an integral aspect is the evaluation of discriminant validity (DV) among the measurement model constructs. The heterotrait–monotrait correlation ratio criterion (HTMT), as detailed in Table 2, was employed for this purpose. DV, reflecting the dissimilarity between constructs, was rigorously examined, with HTMT values approaching 1, indicating a lack of discriminant validity. Following the recommendation by Henseler, et al. (2009), the HTMT values were required to be less than 0.85.

**Table 2.** Results of discriminant validity using HTMT criteria

	Convenience	Comparison	Customer Service	Ease of Use	Variety Seeking	Promotion	Customer satisfaction
<b>Convenience</b>	-						
<b>Comparison</b>	0.596	-					
<b>Customer Service</b>	0.631	0.740	-				
<b>Ease of Use</b>	0.630	0.705	0.871	-			
<b>Variety Seeking</b>	0.803	0.696	0.689	0.685	-		
<b>Promotion</b>	0.742	0.706	0.774	0.769	0.820	-	
<b>Satisfaction</b>	0.692	0.513	0.509	0.524	0.663	0.765	-

Note: All the values of HTMT are less than 0.85 threshold level indicating satisfactory discriminant validity.

**Table 3.** Values of Fronell-Larcker criterion and VIF

	Convenience	Comparison	Customer Service	Ease of Use	Variety Seeking	Promotion	Customer satisfaction	VIF
Convenience	0.786							1.331
Comparison	0.480	0.807						2.413
Customer Service	0.512	0.608	0.743					3.107
Ease of Use	0.505	0.575	0.986	0.758				1.342
Variety Seeking	0.593	0.528	0.529	0.518	0.786			3.117
Promotion	0.602	0.588	0.648	0.635	0.855	0.777		2.731
Satisfaction	0.574	0.435	0.440	0.445	0.565	0.565	0.833	3.102

Note: Diagonal values indicate the square root of average variance extracted. All the values of corresponding to each diagonal are less than that of diagonal value indicating satisfactory discriminant validity. VIF=variance inflationary factor.

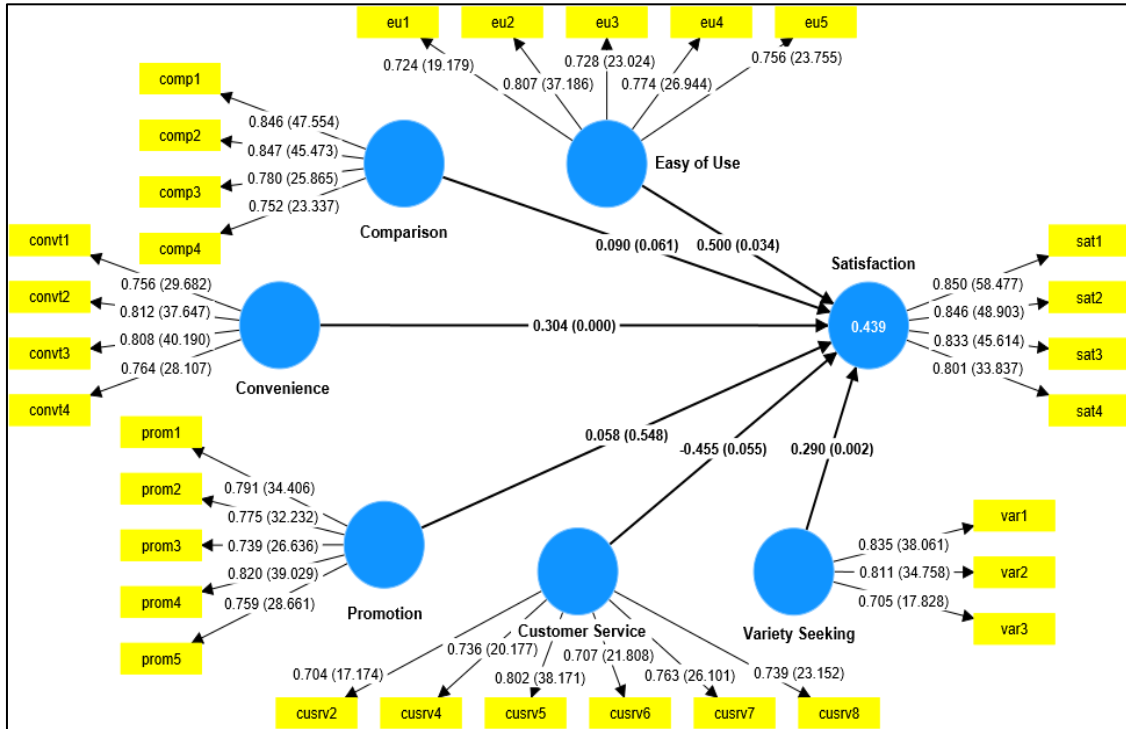
Additionally, Table 3 presents the discriminant validity using the Fornell-Larcker criterion. The results conclusively demonstrate significant discriminant validity within the model, with the highest HTMT score being 0.827, affirming the distinctiveness of the constructs. Consequently, the model components exhibit established reliability and validity, as corroborated by the findings (Rahman, 2023).

#### 4.1.2 Structural model

Before delving into the assessment of the structural model, a thorough examination of potential multicollinearity issues within the data was conducted. This evaluation employed the variance inflation factor (VIF) as a key metric for assessing collinearity levels in PLS-SEM. A VIF exceeding 5 indicates a potential collinearity problem (Hair, et al., 2011). The VIF values observed in this study were consistently below the established threshold of 5.00, signifying an absence of multicollinearity concerns within our model. Detailed VIF values are provided in Table 3. The structural model assessment and testing of proposed hypotheses were carried out using the SmartPLS 3 program, as illustrated in Figure 3.



**Figure 3. Structure Model Analysis**



Note: CONVT: Convenience, COMP: Comparison, CUSRV: Customer Service, EU: Ease of use, VAR: Variety Seeking, PROM: Promotion and SAT: Customers' satisfaction. CONVT1, COMP1, etc., are the survey statements through which latent constructs like comparison, satisfaction, etc., are developed. The values in the brackets for indicators (SAT1, VAR1, etc.) are the t-statistics, and for latent constructs (Satisfaction, Comparison, etc.) are the p-values.

Since PLS does not give the overall goodness of fit measures, using "Standardized root mean squared residual" (SRMR), "Normed fit index" (NFI), and "R-square" ( $R^2$ ), the goodness of fit and SEM performance are also evaluated by the authors (see Tables 4 and 5). The  $R^2$  values in Table 4 are more than 0.400 (Customer Satisfaction=0.439).

**Table 4. Model evaluation with R-squared**

	R-square	R-square adjusted
Satisfaction	0.439	0.431

Note: The R-squared value of 0.439 (or 44%) means that approximately 44% of the variance in the dependent variable (satisfaction) is explained by the independent variables (Ease of use, comparison, convenience, promotion, customer service, and variety seeking)) in the regression model.

**Table 5. Model fitness with SRMR, d\_ULS, d\_G, Chi-square, and NFI**

	Saturated model	Estimated model
SRMR	0.075	0.075
d_ULS	0.669	0.669
d_G	0.236	0.236
Chi-square	362.939	362.939
NFI	0.808	0.808

Note: The values regarding SRMR, d\_ULS, d\_G, Chi-square, and NFI compared between estimated model and saturated model indicate good fitness.

Additionally, the model fit was tested by using the PLS-SEM SRMR. In the present model, the SRMR value is 0.075, below the maximum threshold of 0.08. The value proposing a good model fit (Hair, et al., 2019).

### 4.1.3 Hypothesis Testing

Table 6 shows that the first hypothesis (H1) of this research has been accepted, which indicates online shopping convenience has a positive relationship with consumer satisfaction because it has a coefficient value of 0.304 and the p-value is significant at ( $p < 0.000$ ). This finding is supported by the previous studies (Duarte, 2018; Farida, 2016; Saha, et al., 2021). The second hypothesis (H2) of this research is that comparison has a positive relationship with consumer satisfaction, which is supported by the current research findings as it has a coefficient value of 0.090, and the p-value is significant at ( $p < 0.10$ ).

**Table 6.** Hypothesis testing results

	<b>Coefficients</b>	<b>T statistics</b>	<b>2.5% CI</b>	<b>97.5% CI</b>	<b>P values</b>	<b>Decision</b>
Convenience -> Satisfaction	0.304***	5.227	0.193	0.422	0.000	H1: Supported
Comparison -> Satisfaction	0.090*	1.871	-0.004	0.186	0.061	H2: Supported
Customer Service -> Satisfaction	-0.455**	1.916	-0.969	-0.042	0.055	H3: Not supported
Easy of Use -> Satisfaction	0.500**	2.117	0.085	1.008	0.034	H4: Supported
Variety Seeking -> Satisfaction	0.290***	3.041	0.100	0.473	0.002	H5: Supported
Promotion -> Satisfaction	0.058	0.601	-0.123	0.253	0.548	H6: Not supported

Note: \*\*\*=  $p < 0.01$ , \*\*=  $p < 0.05$ , \*=  $p < 0.10$ , and CI=confidence interval, T statistics indicate the strength of evidence. 2.5% CI and 97.5% CI represent the lower and upper bounds of a confidence interval, respectively.

The third hypothesis (H3) that customer service has a positive relation with consumers' satisfaction has been rejected in the present study. The results are not supported by many other existing studies such as (Jahanshahi, et al., 2011; Luo, et al., 2019). However, in the present study, the customer service process or the infrastructures of the service system may not be up to the mark. The rejection of the hypothesis indicates the online service provider must give more importance to this factor. Another reason might suggest that even though people purchase online from home, sometimes the service provider provides the wrong product or service. As a result, customers become highly dissatisfied.

This study's fourth hypothesis (H4) is that ease of use has a positive relationship with consumer satisfaction, and the hypothesis was accepted. The value of the relationship coefficient is 0.500, and the p-value is significantly closer to zero, i.e. ( $p < 0.05$ ). This hypothesis was supported by preceding research works (Abdel-Maksoud, 2018; Amin, et al., 2014; Wilson, et al., 2021). Hypothesis H5, which recommends variety search, has a positive relationship with consumer satisfaction as the coefficient value is 0.290 and the p-value is

very close to zero ( $p < 0.001$ ). From a psychological point of view, the fact is evident as people do not like to purchase the same things repeatedly. The results are consistent with the research works (Hartono & Wahyono, 2018; Huy Tuu & Ottar Olsen, 2013; Jung & Yoon, 2012). It is also found from Table 6 that the sixth hypothesis has not been supported, which indicates promotion has a positive relation with consumers' satisfaction. The probable reason might be that in Bangladesh, mainly educated people are engaging in online purchases; due to mobile revolutions, the purchasers did not seriously emphasize promotional activities.

The hypotheses H1, H2, H4, and H5 are supported, whereas the present study has rejected the hypotheses H2 and H6. It is found from the path analysis that convenience, comparison, ease of use, and variety seeking have a strong influence on customer satisfaction in online shopping. So, the online service provider must ensure these factors to enhance their sales revenue. On the other hand, the research also found that the promotional activities and customer service do not support the hypothesis. There may be several reasons, such as insufficient or ineffective customer service, which can lead to a lack of responsiveness and assistance to customers, leading to frustration and disappointment. Customers expect fast and efficient service, and when this expectation is not met, it can damage the relationship between the customer and the seller. A promotion can negatively correlate with consumer satisfaction in the online shopping context in the following ways, such as being misleading or confusing. This can lead to disappointment and dissatisfaction when the customer realizes the promotion was not as good as expected. Another reason may be that promotions are not communicated clearly to the customers. Therefore, this study can conclude that our research findings can play an important role for entrepreneurs who are engaged with online businesses or are ready to start new online ventures to run their businesses smoothly.

#### ***4.2. ANN Analysis***

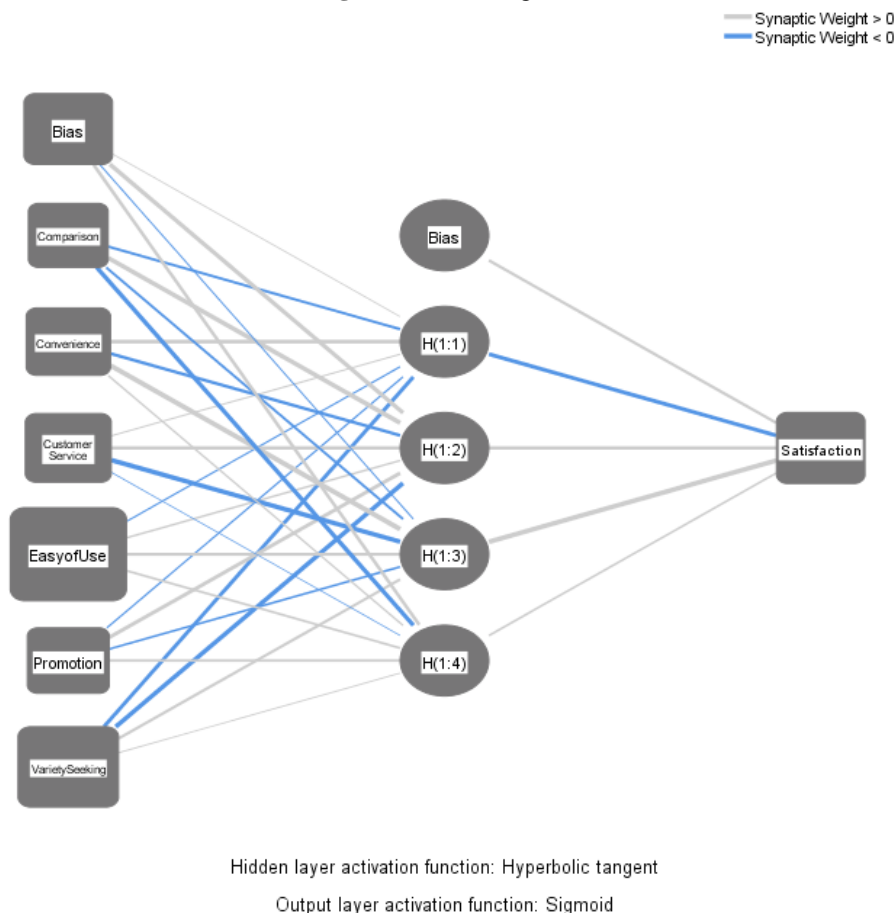
In this phase of the study, akin to the approach employed by Leong, et al. (2020), the research integrates the pivotal factors identified through SEM-PLS path analysis as input neurons for the artificial neural network (ANN) model, as depicted in Figure 4. The rationale for opting for the ANN methodology stems from the non-normal distribution characterizing the data and the existence of non-linear relationships among both exogenous and endogenous variables. Furthermore, the choice of ANN is motivated by its robustness in handling noise, outliers, and scenarios with limited sample sizes. Significantly, ANN accommodates non-compensatory models, allowing for modeling situations where a decrease in one factor does not necessarily require compensation for an increase in another (Leong et al., 2020). Further, PLS-SEM doesn't provide the ranking of the variables as per their effects, while ANN can do that. Thus, the study chooses ANN after PLS-SEM. The execution of the ANN analysis was facilitated using IBM's SPSS version 25 neural network module.

The distinctive capability of the ANN algorithm lies in its adeptness at discerning both linear and nonlinear relationships without the assumption of normal data distribution (Teo, et al., 2015). The algorithm assimilates patterns and dependencies through a systematic training process, enabling it to predict analysis outcomes effectively. This learning process employs a

feed-forward-backward-propagation (FFBP) algorithm, wherein inputs progress in a forward trajectory, and estimated errors are iteratively propagated backward (Taneja & Arora, 2019).

Figure 4 shows the ANN diagram where the hidden layers are presented. The ANN is designed for a task related to customer satisfaction, with four input nodes representing distinct features: Convenience, Comparison, Customer Service, and Ease of Use. The network architecture includes a single hidden layer where computations are performed on the input data. The activation function used for nodes in this hidden layer is the hyperbolic tangent (tanh), which introduces non-linearity to the model and allows it to capture complex patterns in the data. The choice of tanh as the activation function suggests that the model can handle a broader range of input values, helping it learn and represent intricate relationships among the input features. Moving to the output layer, the network is designed to predict customer satisfaction, and the activation function used here is the Sigmoid function. Sigmoid is commonly employed in binary classification problems, where the output represents a probability or likelihood. The overall structure of this Multilayer Perceptron (MLP) with sigmoid activation functions in the input and hidden layers, followed by a tanh activation in the hidden layer and a sigmoid activation in the output layer, indicates a model tailored for predicting customer satisfaction based on the specified input features. Implementing this architecture involves adjusting weights and biases during training to optimize the model's performance in capturing the underlying data patterns and making accurate customer satisfaction predictions.

**Figure 4.** ANN diagram



Implementing Multilayer Perceptions with sigmoid activation functions for the input and hidden layers followed the methodology outlined by Sharma and Sharma (2019). Iterative learning processes were conducted to minimize errors and enhance the accuracy of predictions, aligning with the findings of Idrissi, et al. (2019). By the approach employed by Leong, et al. (2020), a partition of 90% of the dataset was dedicated to the training procedure, with the remaining 10% utilized for testing. To mitigate the risk of overfitting, a ten-fold cross-validation procedure was employed, and the root mean square of errors (RMSE) was calculated, consistent with the recommendations of Ooi and Tan (2016).

Table 7 illustrates that the average RMSE values for training and testing procedures are notably small (RMSE-Mean=0.1093 for training and RMSE-Mean=0.1007 for testing). This compelling result substantiates the assertion of an excellent model fit, indicating the proficiency of the implemented methodology in capturing the underlying patterns within the data (Leong, et al., 2020).

In evaluating the predictive efficacy of each input neuron, a sensitivity analysis was conducted (refer to Table 8). This analysis aimed to gauge the normalized importance of each neuron by computing its relative importance in relation to the maximum importance and presenting the findings as a percentage, as advocated by Karaca, et al. (2019). The outcomes reveal that variety-seeking holds the highest predictive significance, achieving a normalized importance of 100%. Subsequently, ease of use emerges as the second most influential predictor, boasting a normalized importance of 90%. The hierarchy continues with convenience at 80%, promotion at 65%, customer service at 60%, and comparison at 36%. This nuanced understanding of the relative importance of input neurons provides a comprehensive insight into their respective contributions to the model's predictive power, underscoring the pivotal role of variety-seeking and ease of use in shaping the outcomes.

**Table 7.** ANN model fit using RMSE values

ANN	Training			Testing			Total Samples
	SSE	RMSE	N	SSE	RMSE	N	
ANN1	4.427	0.1088	374	0.718	0.1249	46	420
ANN2	4.368	0.1075	378	0.321	0.0874	42	420
ANN3	4.113	0.1045	377	0.489	0.1066	43	420
ANN4	4.323	0.1088	365	0.474	0.0928	55	420
ANN5	4.286	0.1079	368	0.455	0.0935	52	420
ANN6	4.549	0.1096	379	0.303	0.0860	41	420
ANN7	5.034	0.1163	372	0.622	0.1138	48	420
ANN8	4.231	0.1062	375	0.35	0.0882	45	420
ANN9	4.393	0.1088	371	0.651	0.1153	49	420
ANN10	4.986	0.1142	382	0.364	0.0979	38	420
Mean	4.471	0.1093		0.4747	0.1007		
SD	0.2913	0.0034		0.1391	0.0130		

Note: ANN: Artificial Neural Network, SSE: Sum of Square Error, RMSE: Root Mean Square Error, N: Number of Samples, and SD: Standard Deviation.

The results of PLS-SEM and ANN are somehow similar. In particular, PLS-SEM shows that ease of use, variety seeking, and convenience have the highest coefficient values to predict

customer satisfaction. Similarly, ANN shows their ranking higher than that of other variables. Further, in the case of customer service, comparison, and promotion, PLS-SEM shows lower coefficient values with insignificant results in predicting customer satisfaction. Similarly, ANN shows their ranking is lower than that of the ease of use, variety seeking, and convenience variables.

**Table 8.** Evaluating predictive efficacy of each input neuron using sensitivity analysis

ANN	Comparison	Convenience	Customer Service	Ease of Use	Promotion	Variety Seeking
ANN1	0.3408	0.4235	0.4503	1.0000	0.3783	0.7138
ANN2	0.4657	0.8153	0.4536	1.0000	0.7391	0.9863
ANN3	0.2872	0.4610	0.5200	1.0000	0.1975	0.7536
ANN4	0.2200	0.7618	0.8179	0.2955	0.4553	1.0000
ANN5	0.1991	0.6615	0.4024	0.6855	0.3533	1.0000
ANN6	0.4539	0.5581	0.8016	1.0000	0.5963	0.7394
ANN7	0.2906	0.9235	0.2225	0.2972	0.3037	1.0000
ANN8	0.2175	0.3640	0.4096	1.0000	0.3770	0.6116
ANN9	0.4194	1.0000	0.1412	0.8716	0.9475	0.9371
ANN10	0.0869	0.6361	0.7041	0.2617	1.0000	0.5188
Average Importance	0.2981	0.6605	0.4923	0.7411	0.5348	0.8261
Normalized Importance (%)	36%	80%	60%	90%	65%	100%
<b>Ranking</b>	<b>6</b>	<b>3</b>	<b>5</b>	<b>2</b>	<b>4</b>	<b>1</b>

Note: Ranking 1 indicates high impact of variety seeking on satisfaction.

## 5. Discussions

Convenience in online shopping refers to the ease and efficiency consumers can navigate, select, and finalize their purchases. This encompasses factors such as user-friendly interfaces, quick loading times, straightforward payment processes, and the overall simplicity of the shopping experience. For e-commerce platforms, this finding underscores the importance of offering a convenient shopping experience. As the digital marketplace becomes increasingly competitive, platforms prioritizing and enhancing convenience will likely witness higher customer engagement, loyalty, and repeat purchases. This could involve optimizing website design for user-friendliness, simplifying checkout, offering multiple payment options, and ensuring swift page loading times. In essence, as consumers continue to value time-saving and hassle-free shopping experiences, businesses that cater to these needs can expect a direct positive impact on their customer satisfaction metrics and, by extension, their bottom line.

The comparison in online shopping pertains to consumers' ability to easily compare products, prices, and features across different brands or within the platform. This ensures that consumers can make informed decisions, ensuring they get the best value for their money and the most suitable product for their needs. Consumers today are more discerning and informed, often seeking to compare products before making a purchase decision. Platforms that facilitate this comparison, whether through integrated tools, detailed product specifications, user reviews, or price comparison features, can cater to this consumer need. By enabling

consumers to make informed decisions, businesses can enhance trust, reduce return rates due to dissatisfaction, and ensure that customers feel confident in their purchases. In the long run, this can increase customer loyalty, as consumers may return to platforms where they feel empowered to make the best purchasing decisions.

Customer service in the context of online shopping refers to the support and assistance provided by e-commerce platforms to address consumer queries, concerns, and issues. This encompasses factors such as response time, the effectiveness of solutions offered, and the overall quality of interaction between the consumer and the platform's support team. It underscores the need for a thorough evaluation and potential overhaul of customer service strategies and practices. While the exact reasons for dissatisfaction need further investigation, platforms should consider investing in training for customer service representatives, implementing more efficient response systems, and perhaps integrating advanced technologies like AI-driven chatbots for immediate query resolution. Negative experiences with customer service can significantly tarnish a platform's reputation and deter potential repeat purchases. Addressing these issues proactively can help e-commerce platforms regain consumer trust, enhance satisfaction, and ensure long-term customer loyalty.

Ease of use in online shopping refers to the intuitiveness and user-friendliness of the e-commerce platform. This encompasses factors such as the simplicity of the website or app's interface, the clarity of product information, and the straightforwardness of the checkout process. As the digital marketplace becomes increasingly competitive, platforms that prioritize and enhance ease of use will likely witness higher customer engagement and loyalty. This could involve optimizing website design for user-friendliness, ensuring clear and concise product information, simplifying the checkout process, and regularly gathering user feedback to identify and rectify usability issues. In essence, as consumers continue to value platforms that offer a hassle-free shopping experience, businesses that cater to these needs can expect to see a direct positive impact on their customer satisfaction metrics and, by extension, their bottom line.

Variety seeking in the context of online shopping pertains to the desire of consumers to explore and purchase from a diverse range of products and brands. It reflects the consumers' inclination to have multiple options, allowing them to choose products that best fit their preferences and needs. As consumers increasingly value the ability to explore various options and make informed choices, platforms that provide a wide array of products across different categories and brands will likely witness higher engagement and sales. This could involve expanding product listings, collaborating with various suppliers and brands, and ensuring that the platform's search and filter functionalities are optimized to help consumers easily navigate the type. In essence, by catering to the variety-seeking tendencies of consumers, e-commerce platforms can enhance satisfaction levels, encourage prolonged browsing, and potentially increase the likelihood of purchases.

Promotion in the context of online shopping refers to the marketing strategies and tactics used by e-commerce platforms to attract consumers. This includes discounts, special offers, loyalty programs, and targeted advertisements. While promotions might drive initial traffic or short-

term sales spikes, they might not contribute significantly to long-term consumer satisfaction. Businesses must ensure that promotional strategies do not overshadow other critical factors like product quality, customer service, and overall shopping experience. Platforms should consider building genuine value for their consumers rather than relying heavily on promotions. This could involve enhancing product quality, improving user experience, and building trust through transparent practices. In the long run, genuine value and trust can lead to higher consumer satisfaction and loyalty than short-term promotional tactics.

## **6. Conclusions**

This study underscores the pertinence of Decision Sciences in unraveling the multifaceted aspects influencing customer satisfaction in Bangladesh's burgeoning online market. The identified factors, including convenience and variety seeking, offer strategic insights for decision-makers seeking to optimize their approaches, emphasizing the application of quantitative methodologies to enhance decision outcomes in online service provision. The rise of online shopping has changed how customers engage with products and services, making it more suitable and reasonable for shoppers to browse, compare, and buy items from the comfort of their homes. This shift has led to a wealth of research examining the influence of various factors on consumer satisfaction with online shopping. One of the key factors that affects consumer satisfaction is convenience. The ability to shop online at any time of the day, from anywhere globally, has allowed consumers to purchase products without leaving their homes. This convenience factor has become increasingly important in recent years, especially during the COVID-19 pandemic, as many consumers have turned to online shopping to avoid crowds and reduce their risk of exposure to the virus. In theory, this convenience factor will likely increase satisfaction with online shopping because it gives consumers more flexibility and control over shopping. Another important influencing factor for consumer satisfaction regarding online shopping is the ability to make comparisons, as online shopping allows consumers to quickly and easily compare the prices and features of different products, often with just the click of a button. In theory, the ability to compare products and prices should increase satisfaction by providing consumers with greater transparency and information about their purchasing decisions.

Another important factor that influences consumer satisfaction is ease of use. Online shopping platforms that are easy to traverse and use are more likely to be treated as user-friendly and enjoyable, leading to higher consumer satisfaction. In addition, a straightforward and spontaneous checkout process can decrease frustration and increase consumer satisfaction. Finally, variety-seeking behavior also affects consumer satisfaction with online shopping. Consumers who enjoy exploring new products and experiences may be curious about online shopping platforms that offer a wide variety of products and allow them to discover new and exciting products. In theory, variety-seeking behavior should increase satisfaction by providing consumers with more opportunities for exploration and discovery. In conclusion, based on the results of the current research, it was found that convenience, comparability, ease of use, and variety-seeking behavior are important factors that can affect consumer satisfaction with online shopping. By understanding these factors, retailers can



better design online shopping platforms that meet the needs and preferences of their target clients and ensure consumer satisfaction and loyalty.

The findings of this study offer pivotal insights for e-commerce platforms, emphasizing the need to prioritize user experience and convenience. As convenience emerged as a significant driver of satisfaction, platforms should streamline their design, optimize checkout processes, and ensure swift navigation. The positive influence of product comparison and variety-seeking underscores the importance of diversifying product offerings and integrating robust comparison tools. However, the unexpected negative relationship between customer service and satisfaction signals a pressing need for platforms to re-evaluate and enhance customer support mechanisms. Interestingly, while promotions are often hailed as traffic drivers, their negligible impact on long-term satisfaction suggests that platforms should pivot towards building genuine value, emphasizing product quality and overall shopping experience. In essence, e-commerce businesses, especially in emerging markets like Bangladesh, should harness these insights to refine their strategies, ensuring they align with evolving consumer preferences and drive sustained growth in the competitive digital landscape.

Given the study's insights, businesses in Bangladesh should prioritize enhancing the online shopping experience by focusing on user-friendly interfaces, streamlined checkout processes, and robust customer support mechanisms. Investing in training and technology can significantly improve customer service, addressing the unexpected negative relationship found in the study. E-commerce platforms should also consider integrating advanced product comparison tools and diversifying their product range to cater to variety-seeking consumers. As promotions were discovered to have a negligible impact on long-term satisfaction, businesses should pivot towards building genuine value, emphasizing product quality, transparency, and overall shopping experience. For policymakers, fostering a regulatory environment that promotes trust in online shopping is crucial. This could involve implementing stringent data protection laws, establishing clear e-commerce guidelines, and promoting digital literacy. Encouraging collaborations between tech startups and traditional businesses can spur innovation in the e-commerce sector. By harnessing these recommendations, businesses and policymakers can ensure that Bangladesh's e-commerce landscape is poised for sustained growth, benefiting consumers and the broader economy.

While this study provides valuable insights into the factors influencing consumer satisfaction in online shopping, it has several limitations. Firstly, the research is geographically confined to Bangladesh, which may limit the generalizability of the findings to other cultural or economic contexts. Secondly, the study might not have captured all potential factors influencing consumer satisfaction, leaving out some variables that could be significant in other settings like sustainability (Halim & Rahman, 2022; Rahman, 2023; Rahman & Halim, 2022; Rahman & Rahman, 2020) and social responsibility (Islam, et al., 2023). The methodology employed, whether surveys or interviews, might have inherent biases, such as respondent bias or limitations in the scope of questions. Additionally, the study's reliance on self-reported data might introduce elements of subjectivity, potentially affecting the accuracy of the findings. The sample size and selection criteria might also limit the representativeness

of the study, potentially skewing results. Lastly, the dynamic nature of e-commerce means consumer behaviors and preferences evolve rapidly; thus, the findings might have a temporal limitation, being most relevant to the period in which the study was conducted.

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