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# Constituents and Consequences of Online-Shopping in Sustainable E-Business: An Experimental Study of Online-Shopping Malls

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**Abstract:** With the growth of the internet, electronic (online) business has become an important trend in the economy. This study investigates how retailers could enhance their shopping processes and hence help sustain their e-business development. Therefore, we propose a unified information system-consumer behavior (IS-CB) model for online shopping to analyze factors that impact online shopping. We used an online survey to gather data from 633 online customers to test the theoretical model, matching differences using structural equation modeling. Highly influencing factors for the IS-CB online shopping model included perceived value (PV), perceived risk (PR), social factors (SF), perceived ease of use (PEOU), perceived usefulness (PU), online shopping intention, trust, online shopping experience, actual online shopping purchases, entertainment gratification (EG), website irritation (WI), information design (ID), visual design (VD), and navigation design (ND). This study provides important theoretical and practical implications. PV and trust in online shopping can nurture positive attitudes and shopping intentions among online customers. Well-designed websites produce higher levels of trust and reduced WI. Similarly, online shopping sites with better ID, ND, and VD also reduce WI and increase trust. This study fills gaps in previous studies relating to IS and CB and provides explanations for IS and CB constituent impacts on acceptance and use of online shopping. The proposed unified IS-CB explains consumer online shopping patterns for a sustainable e-business.

**Keywords:** consumer behavior; online shopping mall; perceived value; website designs; online shopping intention

## 1. Introduction

Online shopping is a thriving market, and is predicted to grow globally with a compound annual growth rate, CAGR  $\geq 19\%$  by 2020 [1]. As of April 2017, approximately 40% of US internet users said they had purchased things online several times a month and 20% purchased products and services on a weekly basis [2]. This progress has been fueled by the advantages of online shopping.

Given the significance of online sales and customers, it is absolutely essential that retail practitioners gain a widespread understanding of online shoppers [3,4]. Previous studies have emphasized that online practitioners must recognize the constituents of consumer acceptance of online shopping [5,6]. Many studies have explored influencing factors for online shopping, including the information system (IS) and consumer behavior (CB). However, the current study focuses on IS and CB constituents related to online shopping. Few previous studies have considered experimentally justified models to describe IS and CB constituents for online shopping, although several have stressed the need for further investigation of customer persistent use of online shopping sites [7,8]. From a marketing standpoint, the effort required to keep a customer is significantly less than that required to

obtain a new customer, which highlights the significance of finding how to expand customer usage of online shopping sites. Previous studies have only considered specific and individual concerns concentrating on online shopping constituents or consequences. Another noteworthy gap is the relationship between website design elements and website irritation and trust, and perceived risks related to customer trust and attitudes in online shopping. To improve customer online shopping, it is vital for retail practitioners to have superior insight into not just factors that prompt positive and pleasant sentiment among customers, but also factors that incite negative feelings and responses, which could obstruct online shopping behavior [9].

To the best of our knowledge, the present study is the first to address these research gaps and presents a unified model to clarify online shopping, based on a strong theoretical foundation. We integrate recent research into a unified IS-CB model to explain consumer online shopping more thoroughly. The proposed model incorporates many previous models, including the theory of reasoned action (TRA) (CB perspective), technology acceptance (TAM) (IS viewpoint), and user gratification theory (UGT) (IS perspective) [10,11], and extends to include recent studies confirming factors such as perceived value (PV) [12], trust [13], online shopping knowledge [14,15], social variables [16,17], website design (WD) [18], website irritation (WI) [8], and perceived risk (PR) [19].

We also survey real online customer behavior rather than requesting users to simulate an online shopping experience, hence avoiding some previous study inadequacies. In particular, the current study used regular online customers on a real online website rather than customers with a low tendency to shop online and/or student samples. The larger sample size in the current study also provides more validity to the outcomes for online retailers.

Consequently, we propose a unified model of customer online shopping behavior that incorporates IS and CB perspectives. The proposed model was validated experimentally with real online customers using a real online shopping site. Mixing IS and CB approaches provided greater consistency, increasing understanding of fundamental constructs and their link with CB. Confirming the practical significance of constituents and consequences, e.g., prompting shoppers to start online shopping, empowers online retailers to focus on behavioral change efforts, taking more suitable and practical actions to enhance customer retention rate. Therefore, this study incorporates as many empirical results regarding useful IS-CB constructs related to online shopping acceptance as was feasible.

The remainder of the paper is organized as follows. Section 2 develops the proposed model based on current CB and IS literature and examines link between CB and IS and their impact on online shopping. The research hypotheses are also stated and explained. Section 3 details the methodology and Section 4 describes the outcomes for an empirical study of influencing factors using data from regular online shoppers and structural equation modeling (SEM). Section 5 discusses the outcomes and implications. Section 6 summarizes and concludes the paper, providing practical implications and recommendations for marketing and retail practitioners.

## 2. Theoretical Background and Research Hypothesis

### 2.1. Consumer Behavior Model

This study built the CB model based on TRA, as shown in Figure 1, which has been shown to be a very useful theory the study shopping behavior. TRA describes human behavior as rational, where individuals make use of information available to them, emphasizing that attitudes and subjective norms impact human behavior [20]. The CB model shows that relationships among attitudes, subjective norms, intentions, and behavior, not only seem to predict customer intentions and behavior, but also provides a relatively easy method to identify where and how to focus on customer behavioral change [21]. TRA recommends that individual performance for a predefined behavior is controlled by their intention to execute the behavior, which is controlled by their attitudes and subjective norms [22].

Previous studies using TRA provide broad descriptors for factors that influence online customer attitudes toward online shopping behavior, and the impact of these formed attitudes regarding intentions to shop online before settling online purchase decisions, and the subsequent results of real online shopping purchases on customers' post-purchase online shopping experiences and trust [23]. Zenithal [24] argued that PV was "the consumer's overall assessment of the utility of a product (or service) based on perceptions of what is received and what is given". Thus, PV was considered as an antecedent to online customer attitudes [25] and to purchase intention, which impacts attitude [26]. The CB model contends that value-seeking considerations toward online shopping are impacted by online shoppers' attitudes [27], where attitudes impact intentions to shop with online retailers [28], prompting actual online shopping activities [29,30], including online shopping purchases and continued online loyalty. Previous studies proposed that online shopping experiences could only be obtained by online customers through previous purchases, and online shoppers depended strongly on past online shopping experiences when choosing whether to buy from an online retailer they have purchased from previously [31,32]. Various studies have supported this concept, proposing that online shopping experiences give an idea of online customers' experiences while shopping through the websites, hence immediate effects due to genuine online purchases strongly impact resultant online intentions and buying behavior with that specific online retailer [33,34].

In online shopping, trust is strongly dependent on prior online shopping experience, hence online retailers that provide safe and reliable online shopping experiences will enhance online customer trust [35,36]. Trust is the core concept online purchase intention [37,38], and has been suggested to be the imperative factor in achieving sales [39,40]. Thus, enhancing online customer trust improves online purchase intention [35,41].

Perceived risk is a vital antecedent of online intention and negatively impacts consumer attitudes or intentions [42–45]. Park et al. [46] confirmed a negative relationship between PR and apparel purchase intentions in an online product presentation environment, i.e., increased PR decreases purchase intention [47,48]. In the e-commerce context, PR negatively influences customer trust [19]. Thus, we proposed the following hypotheses.

**Hypotheses 1 (H1).** *Online customer attitudes toward online shopping will be positively affected by their PV of online shopping.*

**Hypotheses 2 (H2).** *Online shopping PV has positive impact on purchase intention.*

**Hypotheses 3 (H3).** *Online customer intentions to shop online will be positively affected by favorable attitudes toward online shopping.*

**Hypotheses 4 (H4).** *Actual online shopping purchases will be positively affected by online customer intentions to shop online.*

**Hypotheses 5 (H5).** *Online customer online shopping purchases will positively affect their online shopping experience.*

**Hypotheses 6 (H6).** *Online customer online shopping experiences will be positively affected by their intentions to shop online.*

**Hypotheses 7 (H7).** *Online customer online shopping experiences will be positively affected by their intentions to shop online.*

**Hypotheses 8 (H8).** *Online customer trust in online shopping will positively affect their intention to shop online.*

**Hypotheses 9 (H9).** *Higher perceived customer trust produces lower PR in online shopping.*

**Hypotheses 10 (H10).** *Higher PR provides lower online purchase intention.*

**Hypotheses 11 (H11).** *Higher PR reduces customer attitude in online shopping.*

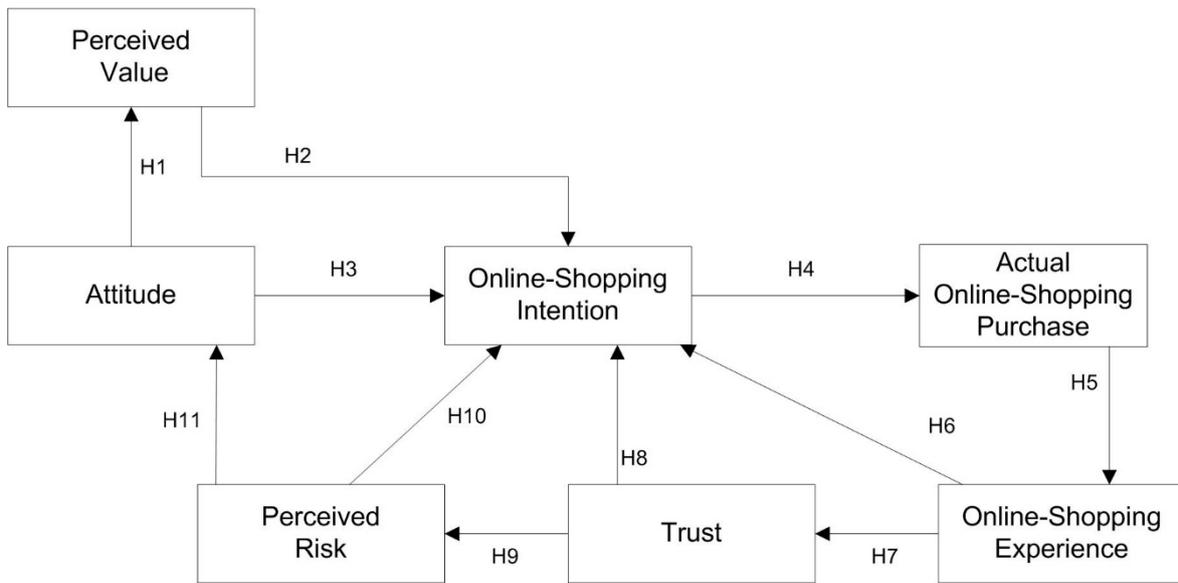


Figure 1. Proposed consumer behavior model for online purchasing.

2.2. Proposed Information Systems Model

The proposed IS model incorporates TAM, UGT, WI and WD, as shown in Figure 2.

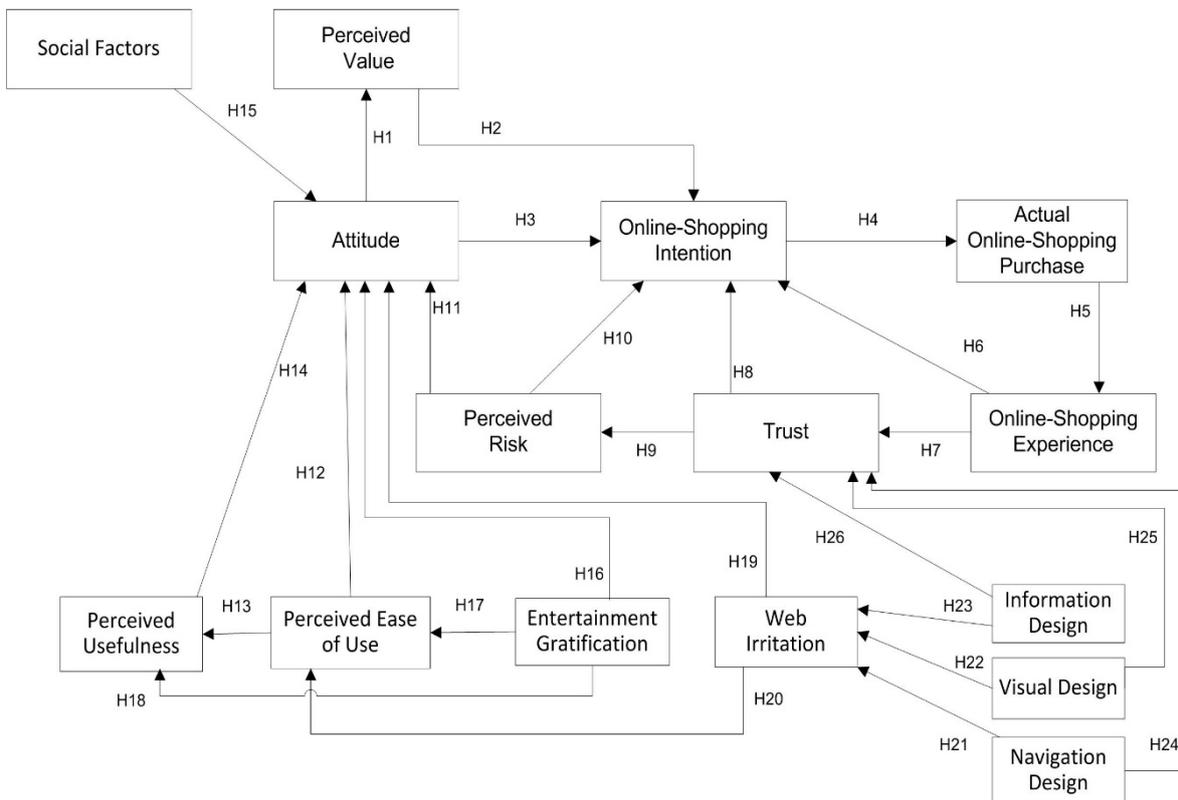


Figure 2. Proposed unified consumer behavior and information system (CB-IS) model

2.2.1. TAM Fusion

The theoretical basis of TAM [49] is based upon TRA [20,22,29] to explain acceptance and use of information technology. In principle, an IS is perceived as useful if it can assist users to complete their purchase better. Thus, if an IS is easy to use then it is perceived as easy to use [50],

and various ISs have been used in diverse technology areas, e.g., internet banking, mobile banking, mobile commerce, RFID (Radio-Frequency Identification), augmented reality, electronic labels, e-health services, e-financial services, location based services, and digital signage based online stores [51–54]. Davis [49] showed that TAM is an economical and vigorous model where customer acceptance of a new technology is assumed to be largely determined by perceived usefulness (PU) and perceived ease of use (PEOU) [55]. Ha and Stoel [6] used TAM to study factors impacting user acceptance of online shopping and showed that PU and PEOU were fundamental determinates of successful acceptance.

Ability to enhance shopping performance, shopping productivity, and most notably, achieving shopping goals, are important factors to make customer shopping successful [56]. This was validated by Barkhi et al. [57] who showed that consumers create propitious attitudes toward products or services they believe to deliver sufficient features toward a solution and negative attitudes toward those that are insufficient. Kim et al. [58] showed that online shopping sites that help customers to make better decisions were perceived as more useful. Lim [11] showed that online shopping sites that provide services to consumers that were not available in traditional shopping, such as product comparison, were perceived as more useful by consumers, leading to generating propitious attitudes toward online shopping.

The ease to learn and become skillful at online shopping site technologies and interfaces, have been confirmed as valid factors to making a technology easy to use [59]. Selamat et al. [60] also showed that a technology perceived to easier to use than another is more likely to be accepted by users, whereas the more difficult a technology is perceived to be, the slower its adoption rate. This was consistent with Teo [61], which showed that easy to use systems generally required less user effort, enhancing the likelihood of adoption and usage. Previous studies have also acknowledged the significance of PEOU as a vital variable in predicting attitudes towards technology based services [62]. Previous IS studies have shown that PEOU impacts user attitude [63] and PU [64].

Another TAM development is adding subjective norms, defined as the perception of others' beliefs regarding behavior [22]. Causal paths have been identified from subjective norms to attitudes [65]. Therefore, we propose the following additional hypotheses.

**Hypotheses 12 (H12).** *Online shopping site PEOU will positively impact online customer attitudes toward online shopping.*

**Hypotheses 13 (H13).** *Online shopping site PEOU will positively affect on online customer PU for online shopping sites.*

**Hypotheses 14 (H14).** *Online shopping site PUs will positively affect online customer attitudes toward online shopping.*

**Hypotheses 15 (H15).** *Social factors will positively affect online customer attitude toward online shopping.*

### 2.2.2. User Gratification Integration

Previous UGT studies have proposed that human behavior is impacted by social, psychological, and sociocultural media characteristics used for receiving gratifications [66]. Cognitive and affective gratifications enhance user decisions regarding media usage [67]. Li [68] showed that these gratifications incorporated cognitive, affective, personal integrative, social integrative, escapist, and medium appeal gratifications. The theory has been employed for adoption of web based services, online purchasing, and human interaction within SNS (Social Networking Service) [69–71]. Marketing and IS practitioners commonly employ UGT for new media, such as internet blogs, SNSs, and user-generated media [70,72–76]. Several gratification types have significant effects on social media marketing messages [75], intention to revisit SNSs [51], fulfilling social needs [67], and maintaining social links [76].

Entertainment gratification (EG) is the degree to which online shopping is entertaining and enjoyable [77]. Online customers want their shopping experience to be entertaining and enjoyable [78], and websites that offer such enjoyment are perceived as useful [79,80]. The value of media

entertainment lies in its capacity to satisfy user requirements for escape from the offline world, hedonistic pleasure, aesthetic enjoyment, and/or emotional release [81]. Kim and Forsythe [80] also found that e-retailers that offer entertainment as visualization proxies, e.g., virtual showcasing and three-dimensional rotations of products, were perceived as easier to use and more helpful by customers. In particular, web sites that provide higher entertainment value to viewers generate pleasing attitudes and spur customers to use the website more regularly [82].

Customer feelings of annoyance, and online shopping site disturbances often cause WI [83], which can significantly reduce media usefulness and create unfavorable attitudes among users. Li et al. [84] showed that web sites with popup banners often generate WI among e-shoppers since they divert customer browsing activity. Azeem [9] showed that incorrect interactive web application usage on shopping websites that spam and interrupt customer privacy and suppress customer acceptance could also lead to WI. Several previous studies support significant WI adverse impact on consumer attitudes towards subject behavior [81,85], and WI often leads to difficulty using a website [8]. Therefore, we propose the following additional hypotheses.

**Hypotheses 16 (H16).** *EG will positively impact customer attitudes toward online shopping.*

**Hypotheses 17 (H17).** *EG will positively impact customer PEOU of online shopping sites.*

**Hypotheses 18 (H18).** *EG will positively impact customer PU of online shopping sites.*

**Hypotheses 19 (H19).** *WI is negatively linked with customer attitudes towards online shopping.*

**Hypotheses 20 (H20).** *WI will negatively impact customer PEOU of online shopping sites.*

### 2.2.3. Integration of Website Design and Website Irritation

Website design is mainly concerned with the information available at the site, visual beauty, navigation ease, and navigating time. Developing an attractive, well-structured, and user-friendly shopping website is critical to enhance customer beliefs and attract online customers [86,87]. Several business websites, even those developed by website experts, are quite unproductive [88]. The confined menus, poor navigation, and complicated access to various products leads to an unfriendly shopping experience [89]. Most e-commerce websites have significant design concerns [90]. A likely reason for website usage failure is a poorly outlined interface [91]. Better designed user interface has positive customer effect to use the shopping website repeatedly [92]. Therefore, poorly designed websites adversely affect customer online shopping experience. When customers experience WI while navigating through the website, they are more likely to quit the purchase and leave the site. This annoying and frustrating experience has long lasting impacts on customer belief regarding vendor ability to provide a friendly and reliable shopping experience [93,94]. Thus, a poorly designed website can give customers genuine reasons to avoid shopping from the site [95]. Badly designed websites frustrate potential customers and hinder navigation, searching, and buying behavior [79,93,96,97].

The three critical website elements include visual, navigational, and informational design, described as follows.

Visual design of a website creates an emotional appeal through content quality and esthetic beauty, including colors, fonts, images, shapes, and layout [98]; and can positively impact customer trust [18,99]. Thus, a pleasing visual website design can enhance customer beliefs about the site and reduce WI.

Navigation design is the underlying structure to assist user navigation through various website sections [100], and can positively affect customer trust [18,99], hence also reducing WI.

Information design refers to how information placed on the website is arranged [99], which can positively impact customer trust [18,99], and hence reduce WI.

Thus, we propose the additional hypotheses as follows.

**Hypotheses 21 (H21).** *Higher perceived website navigation design is negatively related to WI for online shopping.*

**Hypotheses 22 (H22).** *Higher perceived website visual design is negatively related to WI for online shopping.*

**Hypotheses 23 (H23).** *Higher perceived website information design is negatively related to WI for online shopping.*

**Hypotheses 24 (H24).** *Higher perceived website navigation design enhances customer trust in online shopping.*

**Hypotheses 25 (H25).** *Higher perceived website visual design enhances customer trust in online shopping.*

**Hypotheses 26 (H26).** *Higher perceived website information design enhances customer trust in online shopping.*

### 3. Methodology

The methodology includes construct development, exploratory factor analysis, confirmatory factor analysis, and testing the structural model.

#### 3.1. Pretest

Thirty respondents (19 male, 11 female) with previous online shopping experience participated in a pretest. Minor issues were identified in the questionnaire, where respondents struggled with understanding the phrasing of some questions, and some relatively minor wording improvements were made to increase participant understanding.

#### 3.2. Sample and Procedure

This study provides an excellent picture of customer online shopping behavior by using only regular customers, i.e., two or more purchases per month. Thus, we only considered actual and regular customers rather than those that only browsed online shopping sites. An online questionnaire was sent by email to participants in Korea randomly chosen from online shopping mall customers with two or more online purchases per month for the previous 6 months. To motivate respondents, we offered a 15% chance of winning various prizes by completing the survey. Respondent email ID's were used to guarantee that every respondent submitted only one response. The survey ran for six weeks during the spring of 2017.

Responses that matched at least one of the following conditions were removed.

- (a) Respondent submitted the survey more than once.
- (b) Incomplete response.
- (c) Constant response to all questions.
- (d) Respondent had not purchased at least twice each month for the previous 6 months.

We employed a convenient sampling technique for data collection. Each respondent received a cover letter that explained the motivation behind the study and ensured personal privacy. Respondents were urged to answer the questions as honestly as they could, since there was no right or wrong answer. Since people commonly experience conformity pressures when others are present [101], we utilized the internet directly to gather data, with the expectation that most respondents would complete the questionnaire in private using their PCs and/or personal devices. Thus, the likelihood of social desirability bias was reduced for the majority of respondents to some degree.

In total 959 online customers were identified and 889 undertook the survey, with 633 valid completed surveys received. Table 1 shows respondent overall demographics. Approximately 60% were male, 40% female; with good mixture of undergraduate (53%), postgraduate (36%), and PhD (10%) students. Most respondents (80%) were 30 years old or younger.

Common method bias occurs in data when a single factor describes more than fifty percent of the extracted variance [102]. We used Harman's single-factor test to investigate common method bias for all measured variables. This exploratory factor analysis (EFA) showed no single factor accounted for a majority of data variance, with the first factor accounted for only 38.94% of the variance. This confirmed there was no common method bias in the sample data.

**Table 1.** Respondents' demographic characteristics.

Characteristic	Items	N	Percentage
Gender	Male	381	60.2
	Female	252	39.8
Age Range	0–25	237	37.4
	26–30	270	42.7
	31–40	104	16.4
	41–50	22	3.50
Education	Undergraduate	337.4	53.3
	Postgraduate	232.3	36.7
	Ph.D.	63.3	10
Online-shopping Frequency	Less than once a month	212	33.5
	A few times a month	133	21
	A few times per week	175.3	27.7
	About once a day	112.7	17.8
Monthly Income	500 USD and below	178.5	28.2
	501–1000 USD	137.4	21.7
	1001–1500 USD	91.8	14.5
	1501 USD and above	225.3	35.6

### 3.3. Measurements

Measurement scales were adapted from previous studies, with all items constructed on a seven-point Likert scale (1 = strongly disagree; 7 = strongly agree), as shown in Table 2. The Appendix A explains the detailed questionnaire items.

**Table 2.** Constructs and their sources.

Construct	Sources	Construct	Sources
Perceived value	Zeithaml [24]	Entertainment gratification	Huang [79]
Attitude	Kim and Forsythe [80]	Social factors	Ramayah et al. [103]
Online-shopping intention	Chiu et al. [104]	Web-irritation	Gao and Koufaris [96]
Online-shopping experience	Alam and Yasin [105]	Navigation design	Ganguly et al. [99]
Trust	Broekhuizen and Huizingh [33]	Visual design	Ganguly et al. [99]
Perceived ease of use	Davis [49]	Information design	Ganguly et al. [99]
Perceived usefulness	Davis [49]	Actual online-shopping purchase	Sihombing [106]
Perceived risk	Park et al. [46]		

## 4. Empirical Results

### 4.1. Exploratory Factory Analysis

We conducted principle component analysis with maximum likelihood for the 17 constructs. All retained items had factor loadings and communalities  $\geq 0.50$  with no high cross-loadings. Total variance described by the items loading on each factor exceeded 50% and the Kaiser Meyer Olkin measure of 0.84 (with minimum threshold 0.50) and significant result ( $p < 0.01$ ) from Bartlett's test confirmed acceptable applicability of the EFA items. Therefore, the scales were reliable and appropriate for further analysis.

#### 4.2. Confirmatory Factor Analysis

We conducted confirmatory factor analysis (CFA) to examine the reliability of the measurement model before conducting the path analysis. Data were analyzed using SPSS 23 and AMOS 23. Reliability, convergent, and discriminant were satisfactory for all scales. Table 3 shows that Cronbach's  $\alpha$  reliability coefficients were in the range 0.78–0.94, exceeding the recommended minimum (0.70). Factor loadings were significant and in the range 0.74–0.97, meeting convergent validity criteria [107]. Composite reliability of all constructs were well above threshold (0.50) [107].

Table 4 shows that discriminant validity (i.e., average variance extracted (AVE) for each construct) exceeded the correlation shared by that particular construct with other constructs in the model. Although some construct pairs exhibited high inter-factor correlations and square root of AVE exceeded their inter-factor correlations, these constructs have been well established previously, and are widely used in marketing literature [12] (Table 2, sources). Convergent discriminant was established when diagonal elements (square root of AVE) are greater than off-diagonal elements (i.e., correlations among constructs). Since the highest coefficient score below the cut-off (0.90), multicollinearity problems were assumed to be negligible [108]. Thus, the data did not exhibit significant multicollinearity.

Table 5 shows several goodness of fit indices from previous studies used to test the CFA model fit, including chi-square ( $\chi^2$ ), root mean square error of approximation (RMSEA), goodness of fit (GFI), comparative fit index (CFI), and Tucker-Lewis index (TLI). The fit indices consistently show that the measurement and unified models have acceptable fit [108].

**Table 3.** Measurement model results.

Constructs	Mean	SD	EFA	CFA	AVE	Composite Reliability	Cronbach's Alpha
Perceived value (PV)	5.34	0.61			0.70	0.87	0.91
PV1	5.42	0.74	0.63	0.86			
PV2	5.39	0.59	0.58	0.74			
PV3	5.26	0.84	0.61	0.91			
Attitude (AT)	5.25	0.64			0.65	0.85	0.89
AT1	5.32	0.91	0.74	0.81			
AT2	5.48	0.67	0.71	0.87			
AT3	4.96	0.81	0.73	0.73			
Online-shopping intention (OSI)	5.50	0.61			0.75	0.89	0.87
OSI-1	5.14	0.75	0.50	0.81			
OSI-2	5.64	0.68	0.54	0.86			
OSI-3	5.71	0.85	0.56	0.92			0.93
Online-shopping experience (OSE)	5.57	0.71			0.76	0.90	0.93
OSE1	5.63	0.78	0.67	0.79			
OSE2	5.41	0.83	0.61	0.93			
OSE3	5.68	0.81	0.59	0.89			
Trust (TR)	5.67	0.81			0.61	0.82	0.87
TR1	5.47	0.69	0.54	0.78			
TR2	5.71	0.82	0.51	0.83			
TR3	5.84	0.76	0.59	0.74			
Perceived ease of use (PEOU)	5.52	0.83			0.74	0.92	0.90
PEOU1	5.11	0.67	0.56	0.94			
PEOU2	5.48	0.59	0.63	0.83			
PEOU3	5.63	0.78	0.58	0.90			
PEOU4	5.87	0.73	0.65	0.77			
Perceived usefulness (PU)	5.45	0.83			0.69	0.90	0.94
PU1	5.35	0.72	0.57	0.91			
PU2	5.38	0.76	0.53	0.82			
PU3	5.46	0.83	0.58	0.78			
PU4	5.63	0.87	0.59	0.81			
Entertainment gratification (EG)	5.44	0.84			0.58	0.80	0.85
EG1	5.23	0.91	0.53	0.88			
EG2	5.37	0.83	0.55	0.94			
EG3	5.74	0.86	0.51	0.86			

Table 3. Cont.

Constructs	Mean	SD	EFA	CFA	AVE	Composite Reliability	Cronbach's Alpha
Social factors (SF)	5.55	0.87			0.68	0.87	0.84
SF1	5.63	0.79	0.61	0.79			
SF2	5.48	0.86	0.65	0.83			
SF3	5.38	0.73	0.74	0.83			
Website Irritation (WI)	2.73	0.67			0.61	0.82	0.78
WI-1	2.62	0.72	0.62	0.74			
WI-2	2.85	0.69	0.63	0.81			
WI-3	2.73	0.86	0.67	0.79			
Navigation design (ND)	5.58	0.76			0.70	0.87	0.83
ND1	5.38	0.73	0.61	0.79			
ND2	5.64	0.86	0.63	0.84			
ND3	5.73	0.91	0.62	0.89			
Visual design (VD)	5.57	0.84			0.77	0.91	0.87
VD1	5.42	0.68	0.53	0.85			
VD2	5.61	0.77	0.64	0.87			
VD3	5.68	0.69	0.68	0.91			
Information design (ID)	5.73	0.82			0.72	0.89	0.89
ID1	5.74	0.81	0.54	0.90			
ID2	5.66	0.68	0.59	0.84			
ID3	5.79	0.79	0.51	0.81			
Perceived risk (PR)	2.55	0.86			0.56	0.79	0.80
PR1	2.61	0.70	0.51	0.82			
PR2	2.57	0.84	0.56	0.89			
PR3	2.49	0.91	0.52	0.93			
Actual online-shopping purchase (AOSP)	5.52	0.67			0.72	0.89	0.83
AOSP1	5.42	0.77	0.52	0.85			
AOSP2	5.66	0.64	0.53	0.89			
AOSP3	5.49	0.84	0.56	0.81			

Table 4. Correlation matrix.

Attributes	PV	AT	OSI	OSE	TR	PEOU	PU	EG	SF	WI	ND	VD	ID	PR	AOSP
PV	<b>0.84</b>														
AT	0.51	<b>0.81</b>													
OSI	0.41	0.62	<b>0.86</b>												
OSE	0.18	0.52	0.61	<b>0.87</b>											
TR	0.48	0.57	0.47	0.61	<b>0.78</b>										
PEOU	0.36	0.27	0.35	0.47	0.51	<b>0.86</b>									
PU	0.22	0.34	0.36	0.42	0.57	0.44	<b>0.83</b>								
EG	0.52	0.33	0.48	0.35	0.19	0.39	0.49	<b>0.76</b>							
SF	0.42	0.49	0.35	0.43	0.22	0.27	0.46	0.14	<b>0.82</b>						
WI	−0.27	−0.47	−0.33	−0.46	−0.19	−0.26	−0.34	−0.46	−0.37	<b>0.78</b>					
ND	0.15	0.24	0.23	0.41	0.35	0.33	0.37	0.36	0.49	−0.31	<b>0.84</b>				
VD	0.37	0.61	0.52	0.49	0.17	0.24	0.32	0.19	0.11	−0.36	0.14	<b>0.88</b>			
ID	0.67	0.39	0.46	0.24	0.37	0.29	0.14	0.14	0.24	−0.42	0.23	0.41	<b>0.85</b>		
PR	−0.41	−0.22	−0.48	−0.17	−0.12	−0.15	−0.26	−0.29	−0.35	−0.19	−0.32	−0.36	−0.48	<b>0.75</b>	
AOSP	0.49	0.38	0.48	0.45	0.37	0.16	0.51	0.18	0.26	−0.46	0.14	0.45	0.27	0.14	<b>0.85</b>

Note: Diagonal elements in the bold are the square root of the average variance extracted. The correlations between each construct have  $p < 0.05$ .

Table 5. Fit indices for measurement and unified models

Fit Indices	The Measurement Model	The Unified Model	Recommended Values
$\chi^2/df$	1.74	1.92	<3
GFI	0.93	0.98	>0.09
CFI	0.91	0.96	>0.09
TLI	0.94	0.97	>0.09
RMSEA	0.05	0.06	<0.08

#### 4.3. Hypothesis Testing

In the unified model, online customer attitudes and shopping intentions indicated higher variance 25–74% and 41–45%, respectively. Therefore, the unified model confirms that combining CB and IS

describe online shopping behavior more efficiently. Suggested links in the unified model were enriched when CB and IS factors were combined to anticipate online shopping behavior. Path analysis was utilized to test the hypotheses, as shown in Figures 3 and 4 (after checking goodness of fit, Table 5).

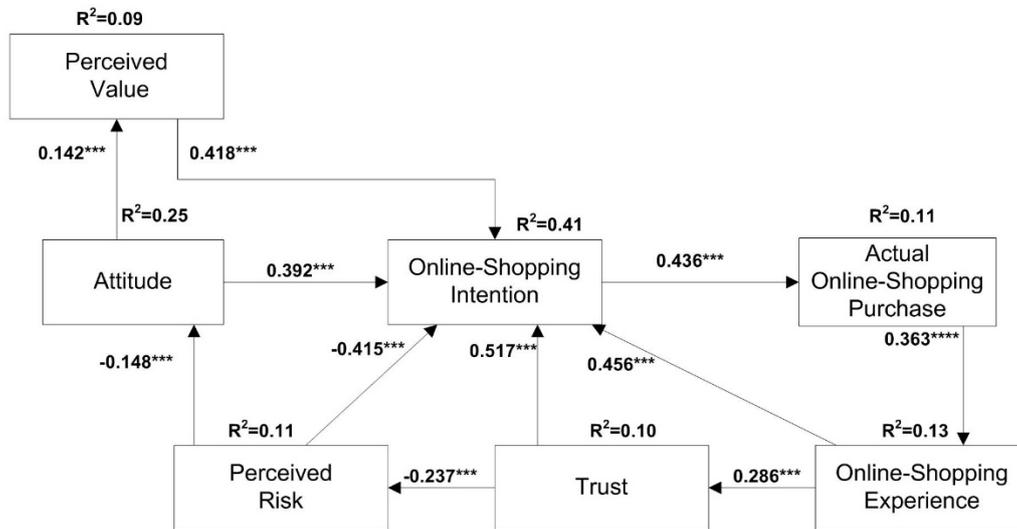


Figure 3. Structural equation modeling (SEM) for the consumer behavior model. Note: Standardized path coefficients are described with the significant values on the top of each value (\*\**p* < 0.01).

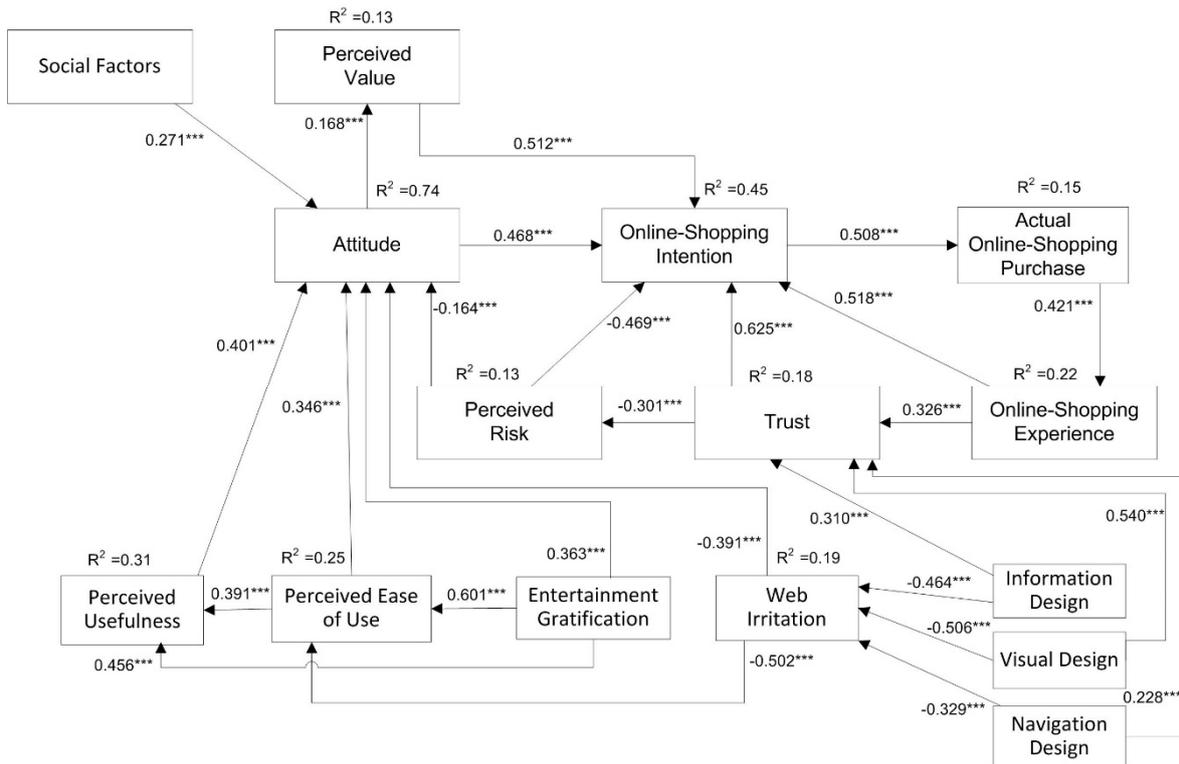


Figure 4. SEM for the proposed unified CB-IS model. Note: Standardized path coefficients are described with the significant values on the top of each value (\*\**p* < 0.01).

Hypotheses were verified by examining standardized path coefficients, standard error, and *t*-values at 0.05 significance level. Table 6 shows that all 26 proposed hypotheses were supported. Therefore, the data supported the proposed unified model.

Table 6. Hypothesis testing for the proposed unified model.

Hypothesis/Structural Relationship A → B	Path Coefficients ( $\beta$ )	Standard Error	t-Values	Results
<i>Descendants of perceived value</i> ( $R^2 = 0.13$ )				
H1: attitude → perceived value	0.168	0.051	3.29 ***	Supported
<i>Descendants of attitude</i> ( $R^2 = 0.74$ )				
H11: perceived risk → attitude	-0.164	0.046	-3.56 ***	Supported
H12: perceived ease of use → attitude	0.346	0.041	4.56 ***	Supported
H14: perceived usefulness → attitude	0.401	0.051	7.86 ***	Supported
H15: social factors → attitude	0.271	0.067	4.04 ***	Supported
H16: entertainment gratification → attitude	0.363	0.056	6.48 ***	Supported
H19: web-irritation → attitude	-0.391	0.041	-9.53 ***	Supported
<i>Descendants of online-shopping intention</i> ( $R^2 = 0.45$ )				
H2: perceived value → online-shopping intention	0.512	0.076	6.74 ***	Supported
H3: attitude → online-shopping intention	0.468	0.073	6.41 ***	Supported
H6: online-shopping experience → online-shopping intention	0.518	0.063	8.22 ***	Supported
H8: trust → online-shopping intention	0.625	0.071	8.80 ***	Supported
H10: perceived risk → online-shopping intention	-0.469	0.059	-7.95 ***	Supported
<i>Descendants of actual online-shopping purchase</i> ( $R^2 = 0.15$ )				
H4: online-shopping intention → actual online-shopping purchase	0.508	0.061	8.32 ***	Supported
<i>Descendants of online-shopping experience</i> ( $R^2 = 0.22$ )				
H5: actual online-shopping purchase → online-shopping experience	0.421	0.037	11.37 ***	Supported
<i>Descendants of trust</i> ( $R^2 = 0.18$ )				
H7: online-shopping experience → trust	0.326	0.046	7.08 ***	Supported
H24: navigation design → trust	0.228	0.062	3.68 ***	Supported
H25: visual design → trust	0.540	0.063	8.57 ***	Supported
H26: information design → trust	0.310	0.058	5.34 ***	Supported
<i>Descendants of perceived risk</i> ( $R^2 = 0.13$ )				
H9: trust → perceived risk	-0.301	0.045	-6.69 ***	Supported
<i>Descendants of web-irritation</i> ( $R^2 = 0.19$ )				
H21: navigation design → web-irritation	-0.329	0.084	-3.91 ***	Supported
H22: visual design → web-irritation	-0.506	0.077	-6.57 ***	Supported
H23: information design → web-irritation	-0.464	0.092	-5.04 ***	Supported
<i>Descendants of perceived ease of use</i> ( $R^2 = 0.25$ )				
H17: entertainment gratification → perceived ease of use	0.601	0.055	10.93 ***	Supported
H20: web-irritation → perceived ease of use	-0.502	0.061	-8.23 ***	Supported
<i>Descendants of perceived usefulness</i> ( $R^2 = 0.31$ )				
H13: perceived ease of use → perceived usefulness	0.391	0.048	8.14 ***	Supported
H18: entertainment gratification → perceived usefulness	0.456	0.066	6.90 ***	Supported

Note: Standardized path coefficients are described with the significant values on the top of each value (\*\*\*)  $p < 0.01$ .

## 5. Discussion and Implications

The motivations behind the present study were threefold.

1. Enrich understanding predecessors of online shopping acceptance and customer behavior in terms of IS and CB viewpoint.
2. Examines the proposed unified IS-CB model.
3. Provide valuable and practical guidelines for online retail managers.

The proposed unified model has higher explanatory power compared with the CB model, and the proposed unified model links were improved (i.e., larger coefficients) when CB and IS were combined to forecast online customer behavior.

### 5.1. Customer Belief Constituents

The CB model was explained through hypotheses H1–H11. H1–H8 showed a positive relationship among attitude, PV, online shopping intention, actual online shopping purchase, and trust. Customer trust and attitude were significant predictors of online shopping intention, along with PV and online shopping experience. These findings are consistent with [11,31]. Thus, to enhance customer behavior in online shopping online retailers need to improve their online shopping sites and provide an easy and secure shopping process that will generating better customer attitude and trust levels. H9–H11 explained the relationship among PR, trust, attitude, and online shopping intention. PR was negatively linked with attitude, trust, and online shopping intention. Thus, if customers feel that the shopping process is risky and unsafe they will not use the online shopping site. This is consistent with [45–48].

### 5.2. Customer Beliefs and Technology Acceptance

Hypotheses H12–H20 summarize TAM and UGT. PU, PEOU, EG, and SF positively affected customer attitudes towards online shopping, whereas EG impacted customer attitudes indirectly through PEOU and PU. Similarly, PEOU impacted online customer attitudes indirectly through PU. Customer attitudes towards online shopping positively influenced their intention to shop at online sites, and their online shopping intentions with online retailers positively influenced their actual online shopping purchases. Thus, procedures to upgrade online shopping adequacy should be primarily directed toward SF, and then PU, PEOU, and EG. These findings are consistent with [6,11,58,63,65,82].

Hypotheses H19 and H20 contend that WI is negatively linked with PEOU and customer attitude towards online shopping. The degree of WI greatly effects customer attitude towards online shopping, i.e., if the shopping websites are annoying, customers form negative attitudes towards the site. This finding confirms [8,84,85] that proposed WI had adverse impacts on customer attitudes. WI makes it extremely difficult for retailers to retain customers and attract them to the website [81]. Thus, retailers should actively alleviate WI to boost business, or they will become uncompetitive in the online retail market.

Recently, social networking sites (SNSs) have attained extensive influence over consumer information searches and consequential purchase decisions. This suggests a profitable approach for online shopping sites to gain increased site traffic and transactions. This study shows that website designers and online marketers should reflect intrinsic and extrinsic motivation issues in their user interface design and advertising to enhance customer association with their sites, e.g., include intuitive chat features or SNS fan pages, etc. To avoid generating WI, online retailers should guarantee their web based shopping sites are clear and free from undesirable popups. Overlooking these concerns will produce negative PEOU and troublesome attitudes among online customers. Therefore, online shopping sites should utilize framework highlights that ensure online customer experiences are pleasant, simple, and valuable.

### 5.3. Actual Online-Shopping Purchase and Post-Purchase Estimations

The proposed unified model describes only 15% of actual online shopping purchase variance. This is fairly low compared with the external variables (PV, PEOU, PU, EG, WI, SF), which clarify 74% of the variance in online customer attitudes. These outcomes are consistent with [29,109] that proposed customers with favorable attitudes and intentions toward a behavior do not necessarily take part in that behavior, since different elements such as perceived behavioral control and affordability may obstruct the customers from really acting in that manner. Online customer actual purchases also had significant positive effect on their online shopping experience. Thus, guaranteeing online customers are satisfied, charmed, and had a good time shopping on the web are fundamental to producing a positive online shopping experience. Thus, this study showed that these online customers felt safe buying from online shopping sites, as shown by the positive trust levels. Similarly, online shopping sites should expand online customer assurances that their sites shield private information. The study shows that productive, safe, and secure online shopping experiences help develop trust and improve the probability of subsequent online purchases. Therefore, online retailers should consider activities that create trustworthiness. Encouraging trust by developing safe online shopping sites is essential to expand repurchase intentions for online customers.

### 5.4. Online Shopping Perceived Value

The current study outcomes are consistent with previous studies that online customer attitudes toward online shopping are positively impacted by their PV of online shopping sites [24,27]. In particular, this study showed that attitudes are positively impacted by their PV of online shopping, and the results highlight the significance for online retailers to guarantee valuable products and services. To enhance customer perception of online shopping, retailers should consider showing price, time savings, enhanced product variety, and upgraded product selection.

### 5.5. Website Design and Website Irritation impacts

Hypotheses H21–H26 investigated relationships among ND, ID, VD, WI, and trust for online shopping. H21 showed that website visual design had a strong negative impact on WI, which suggests that websites with annoying visual design can disturb potential customers, inducing WI. Therefore, website visual design that could cause WI should be avoided, such as poor layout, small fonts, eye dazzling colors, poorly chosen graphics, etc. [77]. Previous studies have also shown that troubling visual aids, such as popup messages, sparkling text, animated banners, and funded advertisements, can divert customers and cause negative perceptions regarding the site [83]. Customers rely heavily on the website visual design to evaluate the view, sense, and quality of products. Therefore, it is of vital importance that websites use attractive visual designs to display products [97].

Hypothesis H22 showed that navigation design had significant negative impact on WI, consistent with [110], strongly supporting that navigation design is an important element affecting user impression and evaluation of the website. Online customers prefer to shop from websites with easy and friendly navigation design, so that they can complete their task with less effort [111]. Thus, websites with better designed navigation generate feelings of pleasure and gratification [112], enhancing customer satisfaction. Therefore, retailers must understand the significance of navigation design very well and ensure customers can easily navigate the site with minimal effort.

Hypothesis H23 showed that information design had significant negative impact on WI. If customers had to fulfil less information related tasks, then they perceive the information design helpful in their shopping. Otherwise, respondents did not fully utilize the information design because they cancelled the purchase before completion. These outcomes are consistent with [55,79,81] that showed information design was vital to capture online customer attention. Therefore, online retailers must pay more attention to information design to ensure customers can easily obtain accurate and

precise information about the products. This helps customers to have a great shopping experience, which will be directly beneficial for retailers as well.

Hypotheses H24–H26 investigated relationships among trust in online shopping, ID, ND, and VD. Trust is a key hurdle in completing online transactions. To enhance sustainable e-business, online retailers require deep understanding of how trust is created and how it influences purchase intention in online stores. The current study showed that website design factors constitute drivers for trust, enhancing customer online purchase intention. Online practitioners should effectively adopt relevant website design factors, e.g., ID, VD, and ND, as advertising tools to enhance trust in the site and hence increase purchase intention.

## 6. Conclusions

This study proposed a unified IS-CB model for online shopping that incorporated TRA, TAM, and UGT, comprising PV, PR, online shopping experience, and trust to explain IS and CB constituents for compliance and use of online shopping. Through the stated hypotheses and experimental studies, the principle findings were as follows

- Immediate indicators of customer acceptance of online shopping are PV, PEOU, PU, WI, and SF.
- EG influences customer acceptance of online shopping indirectly through PEOU and PU.
- WI influences customer acceptance of online shopping indirectly through PEOU.
- PEOU influences customer acceptance of online shopping indirectly through PU.

Customer acceptance of online shopping with regard to their attitudes, which affect their intention to shop online and hence impact their actual online shopping purchase, together with the grave impact on online shopping experience and trust, provides in depth list of the main factors backing online shopping with respect to use of online shopping sites. These conditions will enrich site traffic and enhance shopping transactions. These results highlight multi-disciplinary IS studies regarding IS and CB relationships to clarify the growing online shopping phenomenon in the virtual settings.

### 6.1. Theoretical Implications

The present study covered the gap between previous studies related to IS and CB, providing a deeper explanation of IS and CB constituent impacts on online shopping acceptance and use. Based on TRA, TAM, UGT, and website design theoretical foundations, this study explained customer acceptance and usage behavior and the significance of a set of important constructs for online shopping. In particular, this study shows online customers see IS-CB constructs when they undertake online shopping, expanding understanding into how IS encourages customer shopping behavior in the virtual environments.

Mikalef et al. [113] used UGT perspectives to examine influences from socializing, personal recommendation agents, product selection, and information availability. They showed that socializing and personal recommendation agents positively influenced purchase and WOM (Word of Mouth) intentions, whereas product selection only enhanced purchase intentions. Interestingly, information availability had no significant effect on purchase and WOM intentions. Finally, when purchase intentions were triggered, they tended to increase consumer intentions to WOM. Thus, Mikalef et al. opened new research avenues for online retailers to consider social media forums to advertise their products and obtain customer feedback. This would help online retailers to obtain relevant insights regarding their brand and online shopping and ultimately enhance perceived value, trust, and online shopping intention. Key motivations for online consumers are time and energy saving [114]. Social media and networks have provided a new subset of e-commerce: social commerce. Social commerce differs significantly from conventional e-commerce, allowing social interactions and formation and flow of user generated content [113]. Retail practitioners should consider a wide range of social media platforms to engage potential customers and obtain helpful input from current customers [113].

This study highlighted how online customers perceive a specific arrangement of IS-CB constructs when they engage in online shopping, providing deeper understanding into how IS inspires customer shopping behavior in the virtual realm. These outcomes will significantly assist online shopping technology developers to handle many rapidly growing aspects, such as ease of use, enjoyment, perceived value, etc., and hence satisfy online customer desires.

The study provides a comprehensive outline that can be transformed into knowledge regarding the current condition of online shopping. Outcomes from the proposed unified model provide an ideal mechanism to ensure online customers trust that their desires will be met. Intellectual shopping assistance can powerfully adjust knowledge acquired from IS-CB perspectives to better oversee and extend knowledge contributed by online shopping environments.

## 6.2. Managerial Implications

The current study showed that improving online customer attitudes will prompt positive online shopping intentions and enhance the probability of actual online purchase. Acceptable online purchasing systems and processes will help provide wonderful online shopping experiences, enhancing customer trust in online shopping with specific online retailers. This study provided significant material for website design practitioners and online retailers to improve their shopping processes.

Many retailers understand the intensity of the internet, but struggle to identify appropriate techniques to best impact shoppers. This study provided empirical evidence that PV, attitude, PR, trust, and online shopping experience are all significant predictors of online shopping intention. Less friendly shopping environments are often regarded as a key barrier to online shopping. Increased PR causes the customers to be uncertain and tend to avoid shopping online. To reduce PR, online retailers should provide friendlier systems and guarantee safe shopping processes. This will enhance customers trust and attitude towards online shopping. Although PEOU, PU, EG positively impact online shopping attitudes, i.e., an entertaining and easy to use shopping site generates positive attitudes, whereas a messy and annoying site causes negative attitudes and reduced PEOU. Therefore, better designed websites will have lower WI and enhanced trust, improving online shopping intentions. Thus, online retailers should focus on improving potential shopper beliefs and attitudes, highlighting fruitful encounters of different customers. In particular, social media presence and company products and services related information placed in blogs, etc. will help customer decision making, enhancing customer trust and attitude towards the online retailer.

In the modern competitive market, if marketing practitioners can obtain early information about what customer segments depend on information, navigation, and visual designs, this will help reduce site navigation complexity, and hence better focus their marketing strategies. Website designers should concentrate on producing websites that do not annoy their customers, reducing WI due to website design factors or layout. Navigational experience has positive impact on purchase probability for online stores [74], and enhanced hypertext features, such as conceptual maps, enhance customer positive navigational experience [75]. Therefore, navigational experience is the core contributor for success in the online business environment. Badly designed websites incorporating irrelevant information, unsuitable information arrangement, and/or unpleasant information tools (e.g., popup ads and endlessly running animations) increase the mental exertion to process information, diverting users and enhancing WI [59]. Thus, to ensure easy shopping, it is essential for retailers to realize the importance of website design and factors that affect the design. This study verifies that retail managers should to carefully examine how customers interact with the online shopping website. Better cooperation between diverse disciplines (e.g., human-computer interaction, marketing, and retailing) is important to enhance online shopping experiences.

This study showed that VD, ID, and ND had significant impact on customer WI and attitude. Better website design will reduce WI (and vice versa), and reduced WI will enhance customer online shopping intention, with corresponding improved PEOU, PU, and EG. Thus, e-commerce websites are vital for online shopping, and managers should keep improving website designs to retain current

customers for sustainable business. This will improve customers trust, online shopping intention, and boost sales revenue.

Basic components to provide an enjoyable online shopping experience include increasing PV, reducing PR, and improving ease of use, and safe shopping. Online retailers should ensure their sites are easy to use, increase positive EGT, and reduce WI. It has become critical that online retailers consider SNSs to help customers communicate with the retailer. Adapting these measures will positively influence customer behavior, helping to enhance the probability of purchasing from the website.

### 6.3. Limitations and Directions for Future Research

The current study has several limitations that should be considered before generalizing the findings.

- The data was gathered from exclusively Korean shoppers, and future research should extend the customer base to include European, American, Chinese, and other regions, to allow cross-culture aspects to be considered, and recognize potential similarities and contrasts between the various relationships.
- We did not examine the demographical impacts, e.g., impact differences between males and females or income levels, only the overall effects. This extended analysis could be productive to identify moderating impacts (e.g., age, sexual orientation, and race), providing deeper insight into online shopping.
- We considered individual online purchases exclusively. However, several online retailers offer group purchases, where customers gather together to attract larger discounts. Hence, future work should expand the unified model to inspect generalizing to group purchasing.
- Online stores have many different layouts, including trees, pipelines, and guiding pathways [65]. A more comprehensive inspection of these different design factors would be fascinating to identify which impact of online customers trust and WI.
- Previous studies used trust as a mediator [13] between consumers' perceived risk and online buying intention. Ganguly et al. [99] also showed that trust mediated positive effects of information design, visual design, and navigational design on purchase intention. Thus, many mediators significantly affect this relationship. Since the present study primarily investigated significant attributes of online shopping, determining other significant mediators requires further study focusing on mediating effects of the variables.
- The present study took data from an online shopping mall used by customers of all ages. However, the sample was restricted to only single online shopping mall. Further studies should expand data collection to include several online shopping malls that sell diverse products, to augment generalizability of the current findings.
- Future studies will also examine total and indirect effects of mediators to assist better understanding of customer behavior.

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## Appendix A

Construct	Item	Measure
Perceived value (PV)	PV1	While shopping online I feel a sense of adventure.
	PV2	While shopping I find just the items I look for.
	PV3	Shopping to me is truly a source of pleasure.
Attitude (AT)	AT1	I am comfortable shopping at online-shopping sites.
	AT2	I like to purchase what I need from online-shopping sites.
	AT3	I hold a positive evaluation of shopping online.
Online-shopping intention (OSI)	OSI-1	I prefer to shop online.
	OSI-2	I plan to do more of my shopping via online retailers.
	OSI-3	I am likely to recommend websites to my friends.
Online-shopping experience (OSE)	OSE1	I am pleased with my shopping activity.
	OSE2	I have a delightful shopping experience over the internet.
	OSE3	I feel comfortable using the website.
Trust (TR)	TR1	I feel safe in purchasing from online websites that safeguard my privacy.
	TR2	I believe a safe online retailer will safeguard my private information
	TR3	I am satisfied in buying what I want from secured online retailers.
Perceived ease of use (PEOU)	PEOU1	Learning to operate the online store that I have recently gone to is easy.
	PEOU2	My interaction with the online store I have recently gone to is clear and understandable.
	PEOU3	The online store that I have recently gone to is easy to use.
	PEOU4	The shopping through the online store that I have recently gone to would be fun for its own sake.
Perceived usefulness (PU)	PU1	The online store that I have recently gone to would be useful in buying what I want.
	PU2	The online store that I have recently gone to would improve my shopping ability.
	PU3	The online store that I have recently gone to is convenient for searching and buying products.
	PU4	The online store that I have recently gone to makes it easier to search for and purchase products.
Entertainment gratification (EG)	EG1	I find it entertaining to shop at online retailers.
	EG2	I find that online-shopping sites are fun to use.
	EG3	Using online-shopping sites to purchase products provides me with lots of enjoyment.

Construct	Item	Measure
Social factors (SF)	SF1	I am anxious about what others say when I shop online
	SF2	I prefer to shop at online-shopping sites where my friends shop.
	SF3	I prefer to shop online for products that are recommended by my friends in their postings on social networking sites
Web-irritation (WI)	WI-1	All product options, product attributes and product information are well presented.
	WI-2	I often feel annoyed when shopping online.
	WI-3	I feel that most online-shopping sites are confusing.
Navigation design (ND)	ND1	I can easily navigate through the site.
	ND2	I find this website easy to use.
	ND3	This site provides good navigation facilities to information content.
Visual design (VD)	VD1	The degree of interaction (video, demos) offered by this site is sufficient.
	VD2	This site allowed me to efficiently tailor the information for my specific needs.
	VD3	This website looks professionally well designed.
Information design (ID)	ID1	The website animations are meaningful.
	ID2	In online store, I find the information on this site to be well organized.
	ID3	In online store, I find the information to be logically presented.
Perceived risk (PR)	PR1	I feel personal data might be lost or used incorrectly by the website.
	PR2	The information provided on the website may be exaggerated for advertising purposes.
	PR3	Time required to buy and obtain the travel items will be longer on the website.
Actual online-shopping purchase (AOP)	AOP1	I regularly make online purchases.
	AOP2	I make online purchases extensively
	AOP3	Overall, I have made many online purchases.

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