



Perceived Risk and Trust as Moderators Between Online Shopping Intention and Purchase Decisions

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Abstract

This study aims to identify the factors influencing online shopping intention and purchase decisions among consumers in Ho Chi Minh City, while examining the moderating roles of perceived risk and trust in e-commerce. Data were collected through a structured survey of online shoppers and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The empirical results indicate that product quality, price, promotion programs, and website quality have significant positive effects on online shopping intention, which in turn exerts a strong influence on purchase decisions. Moreover, perceived risk negatively moderates, whereas trust in e-commerce positively moderates the relationship between online shopping intention and purchase decisions. These findings underscore the pivotal roles of perceived value, trust formation, and risk reduction in converting online shopping intention into actual purchasing behavior. The novelty of this study lies in simultaneously examining perceived risk and trust as moderating mechanisms within a PLS-SEM framework in an emerging market context. The results provide practical insights for e-commerce firms by highlighting the importance of improving website quality, enhancing security systems, adopting flexible pricing strategies, and designing targeted promotions to increase online shopping conversion rates.

Keywords:

Online Shopping Intention;
Purchase Decision;
Perceived Risk;
Trust in e-Commerce;
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1- Introduction

The rapid growth of e-commerce has fundamentally transformed consumer purchasing behavior worldwide, particularly following the COVID-19 pandemic, which has accelerated the shift from traditional retail to online shopping platforms. Advances in digital technologies, widespread internet access, and the proliferation of online marketplaces have reshaped how consumers search for information, evaluate alternatives, and make purchase decisions. Recent studies increasingly conceptualize online shopping not merely as a transactional activity but also as an experience-oriented process, where psychological factors such as trust, perceived risk, transparency, and emotional engagement play a central role in shaping consumer decisions [1, 2]. This shift highlights the growing importance of understanding the cognitive and affective mechanisms underlying online consumer behavior.

In emerging economies, this transformation is even more pronounced because of institutional uncertainty, uneven digital infrastructure, and varying levels of consumer trust in online transactions [3]. Vietnam has become one of the fastest-growing e-commerce markets in Southeast Asia, driven by high smartphone penetration, rapid digital payment adoption, and the expansion of platforms such as the Shopee, Lazada, Tiki, and TikTok shops. According to recent market analyses, Vietnam's e-commerce growth is supported by rising household affluence and an expanding consumption class, a large working age (20–39) population, and consumer behaviors favoring online shopping and digital payments, alongside a strong value-seeking (price-sensitive) shift in spending [4]. Taken together, these

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characteristics make Vietnam a particularly relevant context for examining how price sensitivity, trust, and perceived risk interact to shape online purchasing decisions. These dynamics intensify competition among online retailers and place substantial pressure on firms to better understand the mechanisms underlying consumers' online shopping intentions and actual purchase decisions.

Scholarly research has identified several determinants of online shopping behavior, including perceived value, website quality, trust, and perceived risk. Prior studies demonstrate that perceived value - encompassing economic, emotional, and social benefits - plays a critical role in shaping online shopping intention [5–7]. Website quality, reflected through ease of use, security, and information transparency, enhances consumer trust and purchase intention [8–10]. Trust has been shown to outweigh price considerations in certain online contexts, particularly for new or inexperienced customers, because it reduces uncertainty and perceived transaction risk [11]. In addition, information quality, service quality, and electronic word-of-mouth (e-WOM) further contribute to shaping online purchase decisions [12, 13]. In Vietnam, recent studies indicate that product quality concerns, security issues, and transaction risks significantly reduce purchase intentions, especially among Generation Z consumers [14, 15].

Despite these valuable insights, the existing literature still exhibits several critical gaps. First, most prior studies are heavily concentrated on developed economies, which limits the generalizability of their findings to emerging markets characterized by higher uncertainty, weaker institutional trust, and different consumer risk perceptions [1, 3]. Second, a substantial body of research treats online shopping intention as the final dependent variable without adequately distinguishing between intention and actual purchase decisions, despite evidence that intention does not always translate into behavior in online environments [16]. Third, although perceived risk and trust are widely recognized as pivotal constructs in e-commerce research, they are typically examined as direct antecedents rather than as moderating mechanisms that shape the conversion of online shopping intentions into actual purchase decisions. Finally, context-specific and highly practical factors, such as price and promotion programs, remain underexplored, even though they are critical drivers of online consumer behavior in highly price-competitive emerging markets, such as Vietnam.

To address these gaps, this study develops and empirically tests an integrated research model that simultaneously examines (i) the effects of product quality, price, promotional programs, and website quality on online shopping intention and (ii) the transformation of intention into actual purchase decisions under the joint moderating influences of perceived risk and trust in e-commerce. Unlike prior studies that focus primarily on intention formation, this study explicitly distinguishes between intention and behavior, and investigates the conditional mechanisms through which intention is converted into action. By focusing on Vietnam as a rapidly developing e-commerce market and employing Partial Least Squares Structural Equation Modeling (PLS-SEM), this study extends the existing literature by clarifying the distinct roles of intention and behavior and by revealing how trust building and risk mitigation mechanisms condition the intention–decision relationship in emerging digital markets.

The remainder of this paper is organized as follows. Section 2 reviews the relevant literature and develops our research hypotheses. Section 3 describes the research methodology, including the data collection procedures, measurement instruments, and application of PLS-SEM. Section 4 presents empirical results, including an assessment of the measurement model, structural model, and moderation effects. This section also discusses key findings in relation to prior studies and highlights their theoretical implications. Finally, Section 5 concludes the paper by summarizing the main contributions, outlining managerial implications for e-commerce practitioners, addressing manuscript limitations, and suggesting directions for future research.

2- Literature Review and Hypothesis Development

2-1- Literature Review

2-1-1- Technology Acceptance Model

Complementing the Theory of Planned Behavior (TPB), the Technology Acceptance Model (TAM) proposed by Davis [17] focuses on technology acceptance behavior, emphasizing two core determinants: perceived usefulness and perceived ease of use. The TAM is particularly suitable for explaining online shopping behavior, as consumers' purchase intentions are strongly influenced by their perceptions of system functionality, convenience, and efficiency when interacting with digital platforms.

While TPB explains behavior through attitudinal, normative, and control beliefs, TAM adds a technology-specific lens that captures how system characteristics shape consumer intentions. Therefore, the integration of TPB and TAM enhances explanatory power in digital contexts, where online shopping behavior is simultaneously influenced by technological features, cognitive evaluations, and social pressures [18]. In the present study, this combined perspective provides the theoretical foundation for modeling how website quality and system-related attributes influence online shopping intentions.

2-1-2- Trust-Risk Perspective

Based on the theoretical framework of the Risk-Based View of Trust, Das & Teng [19] conceptualized trust as a multi-stage construct comprising trust antecedents, subjective trust, and behavioral trust. Subjective trust reflects consumers' cognitive and psychological assessments of the trustworthiness of an online platform or seller, which directly influences their willingness to accept uncertainty and potential losses in digital transactions.

A key argument of this perspective is that subjective trust and perceived risk are interdependent and inversely related; higher levels of trust reduce perceived risk, whereas heightened risk perceptions undermine trust. This reciprocal relationship has been consistently supported in e-commerce research [20, 21]. Behavioral trust, in turn, represents the observable consequence of subjective trust manifested through consumers' willingness to disclose personal information, engage in transactions, or make online purchases – actions that inherently involve risk-taking behavior in online environments.

From this theoretical standpoint, trust does not merely act as an antecedent of intention but also plays a critical role in shaping whether intention is converted into actual behavior. Accordingly, in the present study, the trust–risk perspective provides a strong theoretical justification for examining perceived risk and trust as key psychological mechanisms that condition the intention–purchase decision relationship [22].

2-1-3- Perceived Value Theory

Perceived Value Theory, developed by Zeithaml [23], emphasizes consumers' evaluative trade-off between perceived benefits and perceived sacrifices in decision-making processes. Perceived value is defined as a consumer's overall assessment of a product or service based on what is received relative to what is given, such as monetary cost, effort, and time.

In e-commerce contexts, this theory is particularly relevant for explaining how consumers evaluate price, promotional programs, and website quality, all of which constitute the central components of perceived value in online shopping environments. When consumers perceive that the benefits derived from online shopping outweigh the associated costs and risks, they are more likely to form favorable purchase intentions and make purchase decisions.

Recent studies further extend this theory by highlighting that perceived value in digital environments is multi-dimensional, encompassing not only functional and economic benefits, but also emotional and social value components [5, 7, 13]. This theoretical perspective underpins the inclusion of price sensitivity, promotions, and website quality as key antecedents of online shopping intentions in the present research model.

2-1-4- Social Influence Theory

Social Influence Theory, introduced by Kelman [24], posits that individual behavior is shaped by three primary mechanisms: compliance, identification, and internalization. In consumption contexts, individuals may adopt purchasing behaviors based on rational evaluations of value, as well as social norms, peer influence, and the desire for social acceptance.

In e-commerce settings, social influence operates through mechanisms such as online reviews, electronic word-of-mouth (e-WOM), social media interactions, and live-streaming commerce. These social cues influence consumers' trust formation, reduce perceived risk, and facilitate the transition from favorable attitudes to actual purchase behavior [7, 24].

This perspective is particularly salient in the Vietnamese e-commerce context, where consumers, especially younger cohorts such as Generation Z, are highly responsive to peer opinions, influencer endorsements, and community feedback [25]. By integrating Social Influence Theory, this study extends beyond purely technological and economic explanations and captures the social and cultural mechanisms that shape online consumer behavior in emerging markets such as Vietnam.

Moreover, in collectivist cultural contexts, such as Vietnam, consumers tend to place greater emphasis on social norms, shared opinions, and community-based cues when making online purchasing decisions. This cultural orientation reinforces the importance of social reassurance in trust formation and heightens consumers' sensitivity to the perceived risk in digital transactions.

Taken together, these four theoretical frameworks—TAM/TPB, Trust–risk perspective, Perceived Value Theory, and Social Influence Theory—form an integrated and multi-dimensional theoretical framework for the present study. This integrated approach allows the research to simultaneously explain (i) the formation of online shopping intention through technological, value-based, and social mechanisms and (ii) the conversion of intention into actual purchase decisions under conditions of trust and perceived risk. By combining these complementary theories, this study moves beyond single-theory explanations and offers a more comprehensive understanding of online consumer behavior in emerging e-commerce markets.

2-2-Empirical Studies

Building on the theoretical foundations discussed in Section 2.1, this section reviews prior empirical studies that examine online shopping behavior from multiple but complementary perspectives. Specifically, existing empirical evidence is synthesized to reflect key theoretical dimensions underlying the present research framework, including technology acceptance mechanisms, value-related factors (such as product quality and price), system- and marketing-related attributes (such as website quality and promotion), and psychological mechanisms related to trust and perceived risk. Although the reviewed studies are presented sequentially, they collectively inform the development of the research hypotheses in section 2.3.

From a technology acceptance perspective, Sin et al. [26] explored the factors influencing online shopping intentions via social media among young consumers in Malaysia. The results showed that perceived usefulness had the most decisive influence on online shopping intention, followed by perceived ease of use and subjective norms. The study also provides practical implications for businesses to effectively exploit social media platforms to promote consumption behavior among young consumers.

Focusing on value-related factors, Kim et al. [11] analyzed the relative influence of two important factors—price and trust—on customers' online purchasing decisions, including those of both potential and returning customers. Understanding the differences in the roles of these two factors at each stage of the transaction experience will help businesses to build sales strategies suitable for each customer group. The results show that perceived trust has a stronger influence than perceived price on the purchase intention of both customer groups. However, perceived price has a greater influence on the purchase decision of returning customers, whereas perceived trust has a more substantial influence on potential customers.

Regarding system-related attributes, Ganguly et al. [27] and Jeon & Jeong [9] demonstrated that website quality, including ease of use, safety, and information transparency, also affects consumer behavior and trust. An easy-to-use, informative, and secure website may increase online purchase intentions by increasing consumer confidence. Trust is a mediating variable that transforms positive consumer perceptions into actual purchase intentions and behaviors. Therefore, enhancing website quality improves user experience and is an effective strategy for online businesses to build customer loyalty and mitigate the intense competition in the e-commerce market.

From a trust–risk perspective, Chiu et al. [28] analyzed the repurchase intention of consumers who had experience shopping online. The results show that both utilitarian and hedonic values positively affect repurchase intentions. Notably, perceived risk plays a moderating role; when perceived risk increases, the impact of utilitarian value on repurchase intention decreases, while emotional value increases. This study clarifies the combined role of reason and emotion in online repeat shopping.

Extending perceived value theory, Ali & Bhasin [5] and Yang et al. [7] confirmed the central role of perceived value in online shopping behavior, with the participation of emotional and social factors. Perceived value is formed by comparing the benefits received and costs spent. However, it is strongly influenced by positive emotions in shopping experiences and the impact of social norms. When consumers feel that online shopping is convenient, enjoyable, and socially accepted or encouraged, it tends to increase their purchase intention and long-term commitment to the shopping platform. This suggests that e-commerce businesses need to build marketing strategies based on economic factors as well as emotional and social aspects to maximize perceived value and promote repeat shopping behavior.

Ali & Aziz [12] examined moderating and contextual mechanisms and developed a theoretical model to examine the effect of website experience, including information quality, security, and service, on online shopping intention, with perceived risk serving as a moderating variable. In addition, research by Handoyo [13] shows that trust, risk perception, security, and electronic word-of-mouth have a significant influence on consumer purchasing decisions in e-commerce.

Nguyen et al. [14] identified and measured the impact of perceived adverse risk components and benefits on online shopping intentions on e-commerce platforms. The results show that product quality risks, personal information security, and transaction risks negatively impact online shopping intentions. Similarly, Nguyen Thi et al. [15] evaluated the impact of personal information security risk perception on Gen's Z online shopping intentions. The results showed that experience with security incidents, awareness of cybersecurity, and security practices positively impacted information security risk perception. Another study by Xuan et al. [29] identified factors affecting online fresh agricultural product purchasing behavior and clarified the moderating role of past behavior. The results show that risk perception hurts online shopping intentions and behavior.

2-3-Hypothesis Development

2-3-1- Product Quality Affects Online Shopping Intention

According to Kim & Lennon [30], product quality is a key factor influencing consumers' purchasing decisions in an e-commerce environment. In the online environment, consumers cannot directly evaluate products, as in traditional shopping, so they often rely on indirect factors such as detailed descriptions, reviews from previous users, and brand

reputation to form judgments about product quality [31]. Previous studies have shown that when consumers perceive products to be of high quality, they increase their trust and purchase intention on online platforms [32, 33].

Product quality also plays an important role in forming loyalty and repeat purchase behavior, especially when consumers perceive that the product meets or exceeds their initial expectations [23]. Therefore, product quality has a positive influence on online shopping intentions.

Based on the above arguments, we put forward the research hypothesis:

Hypothesis 1 (H1): *Product quality positively affects online shopping intention of consumers in Vietnam.*

2-3-2- Price Affects Online Shopping Intention

According to Chiu et al. [28], reasonable pricing creates economic value and stimulates purchase intention. Moreover, Kim et al. [11] argued that consumers frequently compare prices across different e-commerce platforms and are strongly attracted to discount programs and promotional campaigns. Similarly, Lien et al. [34] reported that perceived price fairness plays an important role in shaping consumers' evaluations and purchase intentions in online hotel-booking contexts. Furthermore, research by Santo & Marques [35] and Tan & Le [36] show that price is one of the decisive factors attracting and motivating consumers to prioritize using e-commerce platforms for online shopping.

The following hypothesis is proposed based on the above arguments:

Hypothesis 2 (H2): *Price positively affects online shopping intention of consumers in Vietnam.*

2-3-3- Promotion Affects Online Shopping Intention of Consumers

Promotions are a key marketing strategy for obtaining new customers, and they have greater significance in e-commerce [37-39]. Consumers' choices are substantially affected by promotions as individual preferences and budgets play a role in their purchasing intentions [39]. According to Giang et al. [40], incentives in social media advertising, such as discounts, vouchers, and flat prices, significantly promote shopping intentions. Hinson et al. [41] also found that promotions positively affect online consumer attitudes, whereas Mokhlis et al. [42] noted that promotions reduce perceived risk by increasing perceived value. In addition, promotions contribute to enhancing loyalty [43] and promoting consumers' purchasing intentions through cognitive factors [44]. Thus, we propose the following hypothesis:

Hypothesis 3 (H3): *Promotion positively affects online shopping intention of consumers in Vietnam.*

2-3-4- Website Quality Affects Online Shopping Intention

According to Zeithaml et al. [45], website quality refers to the extent to which a website assists users in searching for, evaluating, and purchasing products and services. Adnan [46] asserted that a user-friendly design, fast loading speed, and strong security increase user satisfaction and purchase intention. Jeon & Jeong [9] also explained that usability, interactivity, and easy navigation enhance purchase decisions. Ganguly et al. [27] highlight that adequate information disclosure, clear payment policies, and security features help alleviate perceived risk and encourage purchase intentions. In e-commerce, perfecting the quality of websites has become more important for gaining a competitive advantage and significantly influences online purchase intention [47].

Consequently, the author proposed the hypothesis as follows:

Hypothesis 4 (H4): *Website quality positively affects online shopping intention of consumers in Vietnam.*

2-3-5- Online Shopping Intention Affects Online Shopping Decisions

In Pavlou's [21] framework, online shopping behavior consists of closely linked activities: searching for information, comparing products, and evaluating options for making a transaction. Each stage of this process affects intention and final purchase decisions. Gefen et al. [48] highlighted that information quality, shopping experience, and platform trust significantly affect behavioral purchase intentions. Barari et al. [49] and Zarei et al. [50] highlighted those social signals, including other users' reviews, social media influence, and digital marketing strategies, also significantly affect online shopping behavior.

Lim et al. [32] found that positive experiences in the online shopping process enhance purchase intention, which influences purchase decisions. Hence, research and analysis of online shopping behaviors are of great significance for e-commerce enterprises to integrate and improve marketing strategies and overall user experience, ultimately increasing conversions and purchase decisions.

Based on the above discussions, the authors propose the following research hypothesis:

Hypothesis 5 (H5): *Online shopping intention positively affects online shopping decision of consumers in Vietnam.*

2-3-6- The Moderating Role

The Moderating Role of Perceived Risk

Featherman and Pavlou [51] argued that when consumers perceive a high level of risk, they tend to delay or reject online shopping decisions regardless of positive information search behavior or favorable interactions with the platform. Risks can arise from many factors, such as payment security, product quality not as described, or risk of personal information disclosure [52, 53]. In addition, Kim et al. [20] pointed out that consumers with a high-risk perception require more information and seek assurance from trusted sources such as customer reviews, return policies, and website security certifications. Conversely, when perceived risk is low, the relationship between online shopping intention and purchase decisions strengthens as customers feel more secure and less hesitant [54].

According to the Trust-Risk Perspective, trust and perceived risk are two central factors that influence transaction behavior in the online environment, in which trust helps reduce perceived risk and promotes purchase decisions [19, 21]. Similarly, according to the Perceived Value Theory [23], risk is considered a perceived cost that reduces the overall perceived value and negatively affects consumer decisions. When trust increases and risk decreases, perceived value is strengthened, making customers feel more secure in shopping.

As a result, the hypothesis is proposed as follows:

Hypothesis 6 (H6): Perceived risk serves as a moderating factor in the relationship between online shopping intention and online shopping decisions among consumers in Vietnam.

The Moderating Role of Trust in e-Commerce

Some studies have shown that trust in e-commerce directly affects online shopping decisions, and moderates the relationship between online shopping intentions and purchase decisions [20, 55]. In the digital environment, information sources play a key role in shaping consumer behavior, as trust reduces perceived risk and strongly promotes online shopping intentions and behavior [21]. According to the “Risk-Based View of Trust” framework [19], subjective trust—the perception of the platform's reliability—is negatively related to perceived risk, whereas behavioral trust is expressed through actions such as transactions and information sharing. As trust increases, customers feel more secure; therefore, the link between online shopping intentions and purchase decisions becomes stronger, especially among Vietnamese consumers who are cautious about electronic transactions.

Consistent with the above argument, Santo & Marques [35] and Hanaysha et al. [47] also found that online shopping resumption intention is significantly influenced by trust in e-commerce sites, in which online information plays an important role in building and strengthening consumer trust. Therefore, we propose the following hypothesis:

Hypothesis 7 (H7): Trust in e-commerce serves as a moderating factor in the relationship between online shopping intention and online shopping decisions among consumers in Vietnam.

3- Research Methodology

3-1- Research Model

The research model (Figure 1) examines the following factors that influence consumers' online shopping intentions and decisions: product quality (PQ), price (PI), promotional offers (PR), and website quality (WE). They are hypothesized to directly and positively impact online shopping intention (BH). Online shopping intentions are expected to positively influence online shopping decisions (DE).

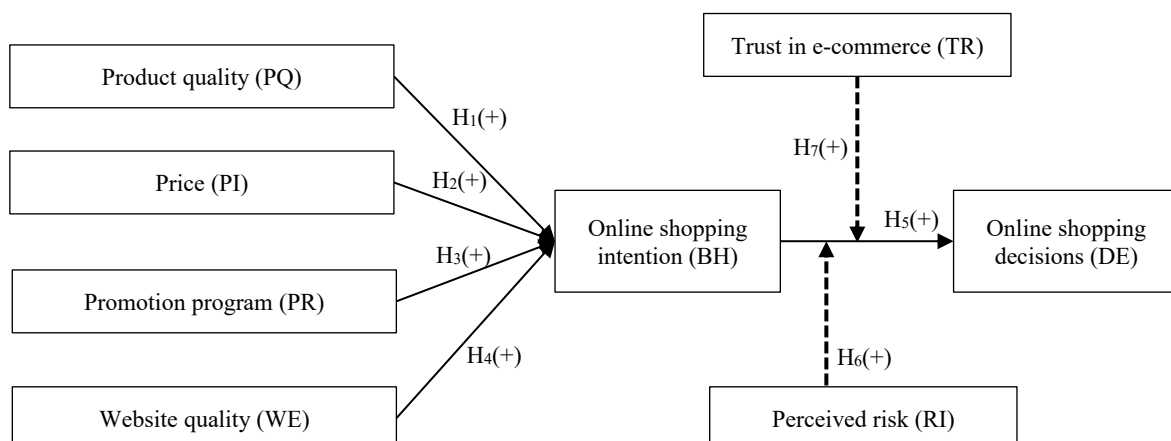


Figure 1. Research model

The model emphasizes the moderating role of trust in e-commerce (TR) and perceived risk (RI) in the relationship between online shopping intentions and decisions. The first moderator is expected to enhance the conversion rate from intention to purchase, whereas the second may weaken this relationship when consumers perceive a high level of risk during the online shopping process.

3-2- Methodology

This study used a quantitative method with Partial Least Squares Structural Equation Modeling (PLS-SEM) to test the research hypotheses. Data were processed using SmartPLS4 software according to a structured analysis process, including the following steps: descriptive analysis, factor loading and convergent validity testing, reliability assessment of the scale using Cronbach's alpha (CA), composite reliability (CR), and average variance extracted (AVE), according to the instructions of [56, 57]. Discriminant validity was tested to ensure the validity of the concepts in the model. Multicollinearity between variables was also examined through the VIF values. Finally, the model fit was assessed using the coefficient of determination R².

Additionally, the f-square (f²) statistic in SmartPLS is a key effect size measure that assesses the impact of an independent variable on a dependent variable. This helps determine whether an exogenous construct has a substantive impact on the endogenous construct. According to Cohen [58], the effect size values were interpreted as follows: small effect: f² ≥ 0.02; medium effect: f² ≥ 0.15; large effect: f² ≥ 0.35.

3-3- Sample Size

Data were collected through a survey questionnaire using a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree," to measure consumers' opinions on the factors in the research model. The survey subjects were customers who shopped online in Ho Chi Minh City and approached several shopping malls and supermarkets from December 2024 to April 2025. According to Nguyen [59], the minimum sample size required was five observations for each variable in the model. A total of 350 survey questionnaires were distributed, of which 309 were valid after removing incomplete questionnaires, achieving a validity rate of 88.3%.

A convenience sampling approach, classified as a non-probability sampling method, was employed because of practical constraints in accessing a comprehensive sampling frame of online shoppers as well as time and cost considerations. Although this method does not ensure full population representativeness, it is widely accepted in exploratory and theory-testing studies using PLS-SEM, where the primary objective is to examine relationships among constructs rather than to generalize to the population [56, 60] to enhance data quality. Incomplete and invalid responses were excluded, and all data collection procedures complied with ethical research standards.

4- Results and Discussion

4-1- Research Results

Table 1 presents the descriptive statistics of the study sample of 309 participants, classified according to three criteria: sex, age, and income. In terms of sex, the number of women accounted for a higher proportion, with 167 people (54.0%), while men accounted for 142 people (46.0%). In terms of age, the group from 18 to 30 years old accounted for the highest proportion with 119 people (38.5%), followed by the group from 31 to 50 years old with 87 people (28.2%), the group under 18 years old was 71 people (23.0%) and the group over 50 years old accounted for the lowest proportion with 32 people (10.4%). In terms of income, most participants had an income of 15 to 25 million VND/month (47.9%), followed by the group with 26 to 35 million VND (23.6%), the group with over 35 million VND (14.9%), and the group with less than 15 million VND had the lowest proportion (13.6%).

Table 1. Descriptive statistics

	Criteria	Frequency	Percentage
Gender	Male	142	46.0%
	Female	167	54.0%
	Total	309	100%
Age	Under 18 years old	71	23.0%
	From 18 to 30 years old	119	38.5%
	From 31 to 50 years old	87	28.2%
	Over 50 years old	32	10.4%
	Total	309	100%
Income	Under 15 million dong	42	13.6%
	From 15 to 25 million dong	148	47.9%
	From 26 to 35 million dong	73	23.6%
	Over 35 million dong	46	14.9%
	Total	309	100%

Table 2 presents the reliability and convergent validity indicators of the scales, including Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). All scales achieved Cronbach's alpha values > 0.7, indicating high internal reliability. The CR values of the scales were also greater than 0.7, indicating that composite reliability met the requirements. Simultaneously, the AVE of all variables was greater than 0.5, indicating that the scales achieved good convergent validity. These indicators exceeded the recommended threshold, indicating that the scales used in this study were reliable and valid for further model analysis.

Table 2. Cronbach's Alpha, Composite Reliability, Average Variance Extracted

	Cronbach's alpha	Composite reliability	Average Variance Extracted (AVE)
BH	0.962	0.963	0.929
DE	0.919	0.922	0.863
PI	0.868	0.869	0.717
PR	0.957	0.959	0.886
PQ	0.958	0.961	0.892
RI	0.957	0.963	0.921
TR	0.966	0.968	0.937
WE	0.919	0.920	0.860

As shown in Table 3, discriminant validity testing using the HTMT index revealed that all values were below the threshold of 0.85, demonstrating that the concepts in the model were differentiated. This confirms that the scales are reliable and ensure discrimination, thus fully meeting the conditions for testing the structural model.

Table 3. Assessing discriminant validity using the HTMT index

	BH	DE	PI	PR	PQ	RI	TR	WE	TR × BH	RI × BH
BH										
DE	0.524									
PI	0.732	0.437								
PR	0.402	0.222	0.371							
PQ	0.726	0.398	0.725	0.350						
RI	0.264	0.635	0.237	0.282	0.195					
TR	0.396	0.656	0.243	0.148	0.238	0.678				
WE	0.631	0.624	0.648	0.361	0.608	0.357	0.356			
TR × BH	0.519	0.132	0.237	0.054	0.239	0.112	0.142	0.201		
RI × BH	0.424	0.211	0.462	0.176	0.256	0.054	0.049	0.405	0.616	

Table 4 presents the VIF (Variance Inflation Factor) index used to check for multicollinearity between variables in the internal structural model. All VIF indices were less than five, indicating no multicollinearity between the independent variables in the model. The next section presents the model estimation results using SmartPLS (see Figure 2).

Table 4. Inner model - Matrix

	VIF
BH → DE	1.658
PI → BH	2.009
PR → BH	1.184
PQ → BH	1.980
RI → DE	1.811
TR → DE	2.024
WE → BH	1.699
TR × BH → DE	1.942
RI × BH → DE	1.770

Figure 2 is a diagram of the structural model results (PLS-SEM), in which the connecting lines show the relationships between the variables, along with the path coefficients and R-squared (R^2) values of the dependent variables. The R-square value indicates the goodness of fit of the model. Specifically, the behavioral variable (BH) had $R^2 = 0.598$ and the decision variable (DE) had $R^2 = 0.589$, meaning that the relevant independent variables explained 59.8% and 58.9% of the variation. According to Hair et al. [56], these values are medium to high, reflecting the model's good explanatory power.

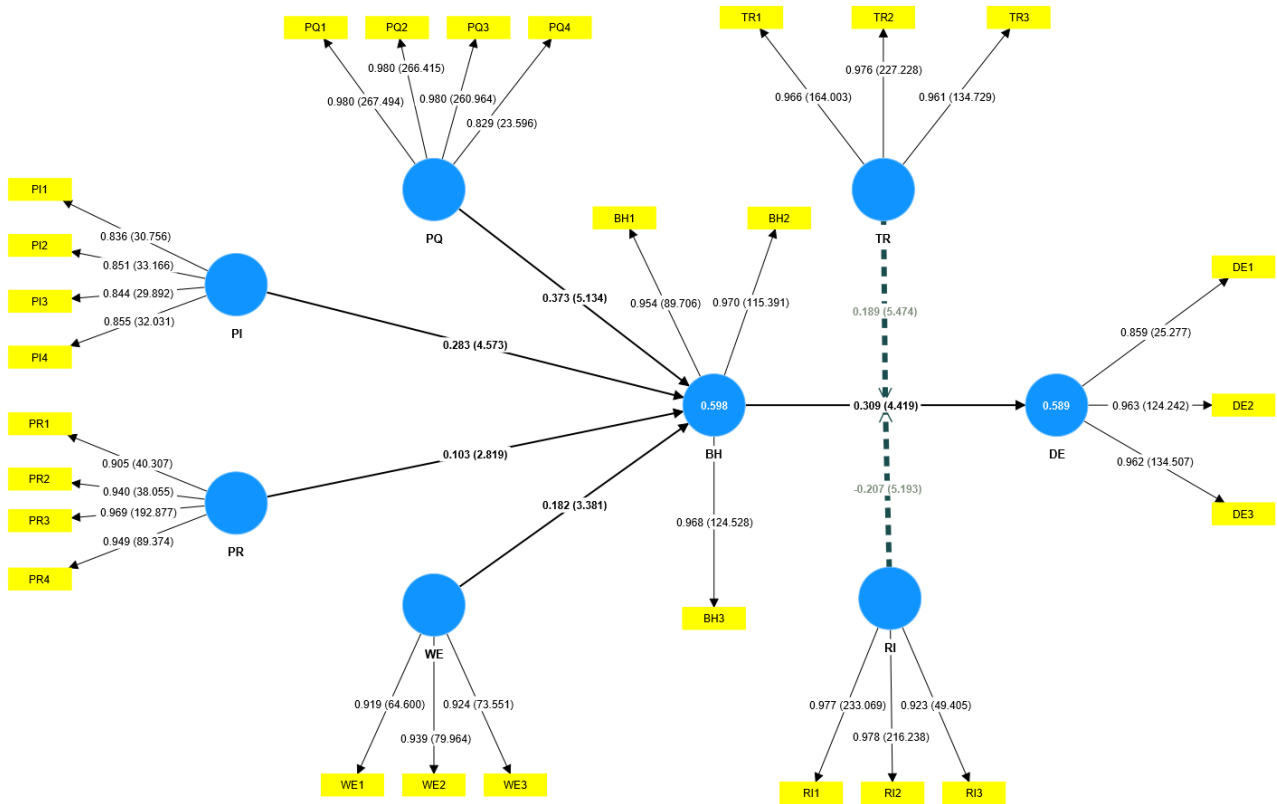


Figure 2. PLS-SEM structural model results

The f-square results in Table 5 show that the influence of the independent variables on the dependent variables in the model is small to medium. Specifically, PQ and TR have a medium influence on intention (BH) and decision (DE), with f^2 values of 0.175 and 0.172, respectively. The intention factor (BH) also has a medium impact on the decision (DE), with $f^2 = 0.141$. Factors such as perceived risk (RI), price (PI), and two interaction variables ($TR \times BH$ and $RI \times BH$) had a small to medium influence ($f^2 = 0.099-0.122$). In contrast, website quality (WE) and promotion programs (PR) have a very small influence on online shopping intention ($f^2 = 0.049$ and 0.022 , respectively). Overall, the model shows that PQ and TR are two factors that have a stronger impact than the other factors in explaining consumer intention to shop online and purchase decisions.

Table 5. f-square

	f-square
BH → DE	0.141
PI → BH	0.099
PQ → BH	0.175
PR → BH	0.022
RI → DE	0.104
TR → DE	0.172
WE → BH	0.049
$TR \times BH \rightarrow DE$	0.122
$RI \times BH \rightarrow DE$	0.121

4-2- Discussions

The results of the study (Table 6) confirm that online shopping intention (BH) has a significant influence on online shopping decisions (DE), which is consistent with the argument of Pavlou (2003) [21] in the integrated model of trust-Risk and TAM, as well as the results of [49] on the role of shopping experience in the decision-making process. This

finding further supports the intention–behavior consistency assumption commonly discussed in behavioral theories, such as TPB, while also acknowledging that such consistency is conditional rather than automatic in online environments. This reinforces the argument that behavioral experience, from searching and comparing to evaluating products, is an important premise that leads to actual purchase actions in the digital environment. In emerging e-commerce markets, such as Vietnam, where consumers often face uncertainty regarding sellers and transactions, a strong intention is particularly critical to overcome hesitation and trigger actual purchasing behavior.

Table 6. Bootstrap Results Summary

	Original sample	Sample mean	Standard deviation	T statistics	P values
BH → DE	0.309	0.314	0.07	4.419	0.000
PI → BH	0.283	0.276	0.062	4.573	0.000
PR → BH	0.103	0.104	0.037	2.819	0.005
PQ → BH	0.373	0.380	0.073	5.134	0.000
RI → DE	0.278	0.281	0.056	4.962	0.000
TR → DE	0.378	0.376	0.069	5.506	0.000
WE → BH	0.182	0.181	0.054	3.381	0.001
TR × BH → DE	0.189	0.193	0.035	5.474	0.000
RI × BH → DE	-0.207	-0.213	0.040	5.193	0.000

Regarding the factors influencing online shopping intention, the results showed that price (PI), product quality (PQ), promotion (PR), and website quality (WE) had positive effects. This result is consistent with the studies of [26, 28], where reasonable prices and product quality were identified as important factors driving online consumer behavior (purchase intention). Significantly, PQ exhibits the strongest effect on intention among the examined antecedents, suggesting that, despite the price-sensitive nature of online consumers, quality assurance remains a dominant concern in e-commerce contexts characterized by information asymmetry.

In addition, the positive impact of website quality aligns with the findings of [9], emphasizing the role of ease of use, information transparency, and system reliability in shaping positive digital experiences. This result highlights that website quality functions not only as a technical facilitator, but also as a trust-building signal that reduces uncertainty during online shopping. Promotional programs (PR) also demonstrate a statistically significant effect, indicating that short-term incentives and perceived economic benefits remain relevant in stimulating purchase intention in highly competitive and promotion-driven markets, such as Vietnam. However, the relatively small f^2 effect size associated with promotion suggests that its influence is incremental, rather than dominant. In a market characterized by frequent discounts and widespread promotional campaigns, promotions may function more as baseline expectations or hygiene factors, contributing to intention formation without strongly differentiating platforms. These findings collectively corroborate Perceived Value Theory [23], suggesting that online shopping intention is formed through consumers' evaluations of both functional and economic benefits.

This study clarifies the moderating role of perceived risk (RI) and trust in e-commerce (TR) in the relationship between purchase intention and purchase decisions. According to trust–Risk Perspective theory [19, 22], when perceived risk increases, the link between purchase intention and purchase decision is weakened, which is confirmed by the negative interaction coefficient ($RI \times BH \rightarrow DE$). This is consistent with the results of [51, 53], where perceived risk is considered a barrier that reduces online purchase intention and decisions. The results suggest that even when consumers express strong purchase intentions, heightened concerns related to payment security, privacy, or product delivery can prevent the intention from materializing into action. By contrast, trust in e-commerce has a positive moderating effect on the intention–decision relationship ($TR \times BH \rightarrow DE$). This result aligns with prior studies [20, 55] that emphasize trust as a critical enabler of online transactions. The positive moderation effect indicates that trust not only directly enhances intention but also strengthens the behavioral realization of intention by mitigating uncertainty and perceived vulnerability. In other words, trust functions as a facilitating condition that amplifies the impact of intention on actual purchase decisions, especially in environments characterized by high information asymmetry and limited institutional safeguards. These moderating effects should also be interpreted within the collectivist cultural setting of Vietnam, where consumers tend to rely heavily on interpersonal trust, social validation, and collective reassurance. This cultural orientation intensifies the role of both trust and perceived risk in shaping online purchase decisions, as consumers are more sensitive to social cues and collective judgments when evaluating uncertainty in digital transactions.

Taken together, these findings extend prior e-commerce research by demonstrating that the intention–behavior relationship is contingent upon contextual psychological factors rather than being linear or unconditional. By simultaneously examining perceived risk and trust as moderators, this study provides a more nuanced explanation of why consumers with similar intentions may exhibit different purchasing behaviors. Compared with previous studies that predominantly focus on intention formation, this study advances the literature by explicitly modeling and empirically validating the conditional mechanisms through which intention is translated into actual purchase decisions in an emerging market context.

Additionally, the observed small to medium f^2 effect sizes should be interpreted with caution but not underestimated in practical terms. In the context of e-commerce, in which firms operate at scale and interact with large volumes of consumers, even small effect sizes represent incremental influences that can lead to meaningful improvements in purchase intention and conversion rates. From a managerial perspective, constructs exhibiting small f^2 values, such as promotion programs or website quality, should be viewed as levers for continuous optimization rather than as negligible factors. Consistent enhancements in these areas can generate substantial performance gains, particularly in highly competitive digital markets.

5- Conclusions, Management Implications and Limitations

5-1- Conclusions

This study investigates online consumer behavior in the context of Vietnam's rapidly growing e-commerce market by employing a quantitative research approach using Partial Least Squares Structural Equation Modeling (PLS-SEM). Drawing on an integrated theoretical framework, this study examines how product quality, price, promotion programs, and website quality influence online shopping decisions through the mediating role of online shopping intentions. The empirical findings confirm that online shopping intention serves as a critical behavioral mechanism that translates consumers' evaluations of value- and system-related attributes into actual purchase decisions. Among the antecedents, product quality and website quality emerge as particularly influential factors, highlighting that Vietnamese consumers place strong emphasis on both functional value and the quality of the online shopping experience. These results reinforce the relevance of the Perceived Value Theory and technology-based acceptance perspectives in explaining online shopping intentions in emerging e-commerce markets.

5-2- Management Implications

The findings of this study offer several important managerial implications for enhancing e-commerce performance in emerging markets, like Vietnam.

First, given the significant positive effects of product quality, price, promotion, and website quality on online shopping intentions, e-commerce firms should prioritize strategies that enhance consumers' perceived value. Managers should adopt flexible and transparent pricing strategies, design targeted promotional programs, and continuously improve website functionality, usability, and information quality. The strong impact of product quality highlights the importance of reliable product descriptions, authentic images, and consistent service delivery in reducing information asymmetry in online transactions.

Second, the results demonstrate that online shopping intentions play a critical mediating role in converting value perceptions into actual purchase decisions. This implies that firms should focus not only on attracting traffic, but also on strengthening consumers' purchase intentions by improving their overall online shopping experience. Simplifying navigation, optimizing search and recommendation systems, and providing responsive customer support can help reduce the cognitive effort and enhance consumer confidence during the decision-making process.

Third, the significant moderating effects of perceived risk and trust underline the necessity for risk management and trust-building strategies. Managers should actively minimize perceived risk by ensuring secure payment systems, transparent privacy and data protection policies, and clear return and refund procedures. Simultaneously, trust can be strengthened through third-party certification, customer review systems, timely complaint resolution, and consistent communication. By doing so, firms can effectively facilitate the translation of strong purchase intentions into actual buying behavior.

Finally, the findings suggest that e-commerce firms should adopt segmentation-focused strategies, particularly targeting young and middle-income consumers, who are highly sensitive to price, technology, and online experiences. Marketing campaigns tailored to these segments should emphasize convenience, economic value, and digital engagement as such approaches are more likely to sustain long-term customer relationships and improve overall business performance.

5-3- Limitations

Although this study made important contributions, some limitations still need to be considered. First, the scope of the study sample is limited, as it only focuses on customers in some districts in the center of Ho Chi Minh City. This may have caused the results to not fully and comprehensively reflect the research results. Additionally, the research model does not consider cultural factors, local consumption habits, or differences in technological experience, which may affect online shopping intentions and decisions. Ignoring these factors may reduce the generalizability of the results to a broader context. Future studies may explicitly incorporate cultural dimensions, such as collectivism and individualism, as moderating or contextual variables to further explain cross-cultural differences in trust and risk perceptions in e-commerce.

6- Declarations

6-1- Author Contributions

Conceptualization, T.N.T. and L.D.N.; methodology, T.N.T.; software, T.N.T.; validation, T.N.T., L.D.N., and D.T.K.C.; formal analysis, T.N.T.; investigation, T.N.T.; resources, T.N.T.; data curation, L.D.N.; writing—original draft preparation, T.N.T.; writing—review and editing, T.N.T.; visualization, L.D.N.; supervision, T.N.T.; project administration, T.N.T.; funding acquisition, L.D.N. All authors have read and agreed to the published version of the manuscript.

6-2- Data Availability Statement

The data presented in this study are available in the article.

6-3- Funding

The study is funded by Saigon University.

6-4- Institutional Review Board Statement

Not applicable.

6-5- Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

6-6- Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

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Appendix I: Questionnaire

No.	Items	Sources
<i>Product quality</i>		
1	The product has consistent quality.	
2	The product is well constructed.	Sweeney & Soutar [61]
3	The product is durable.	
4	The product meets an acceptable level of quality for me.	
<i>Price</i>		
1	The product price is fair.	
2	The product price is acceptable.	Santo et al. [35] and Tan & Le [36]
3	Online shopping is economical.	
4	Online prices are competitive.	
<i>Promotion</i>		
1	Sales promotions make me more inclined to shop online.	
2	Promotional offers such as “buy one get one free” increase my likelihood of purchasing additional products online.	Mishra et al. [39]
3	Sales promotions stimulate additional purchases.	
4	Online stores offer discounted prices.	
<i>Website quality</i>		
1	The website is easy to use when searching for and purchasing products.	Jeon & Jeong [9], Ganguly et al. [27], Zeithaml et al. [45], Hanaysha et al. [47]
2	The website provides accurate information about products and transactions.	
3	The website makes me feel secure when shopping online.	
<i>Online shopping intention</i>		
1	I intend to continue shopping online in the near future.	
2	I intend to purchase products from the online stores where I usually shop.	Hanaysha et al. [47]
3	I am very likely to purchase products from this online store.	
<i>Online shopping decisions</i>		
1	I have purchased products from this online store/vendor.	
2	I shop at this online store/vendor frequently.	Indiani et al. [62]
3	I have purchased many products from this online store/vendor.	
<i>Trust in e-commerce</i>		
1	This online store is trustworthy.	
2	This online store consistently fulfills its commitments to customers.	Hanaysha et al. [47]
3	This online store acts in the best interests of its customers.	
<i>Perceived risk</i>		
1	I believe that shopping online involves a high level of risk.	Featherman & Pavlou [51], Forsythe & Shi [53]
2	I am concerned that products purchased online may not be worth the money I pay.	
3	I am worried that my payment information may not be secure when shopping online.	