

# Decoding Online Shopping Behavior in Malaysia: The Critical Influence of Consumer Trust

Vijayaletchumy Krishnan<sup>1</sup>, Neeta Jayabalan<sup>2</sup>, Jiayuan Guo<sup>3</sup>, Perengki Susanto<sup>4</sup>

## Abstract

*The rapid evolution of e-commerce has heightened the importance of consumer trust, especially regarding privacy and security. This study investigates how key trust factors; security, privacy, transparency, and reliability affect consumer trust and online shopping behavior. Using a quantitative approach with Partial Least Squares Structural Equation Modeling (PLS-SEM), the research examines how these factors impact consumer confidence in online transactions and their purchasing decisions. Findings indicate that privacy concerns negatively affect consumer trust, while security measures and transparency positively influence trust. The study offers valuable insights for e-commerce platforms to enhance trust-building strategies and improve consumer behavior and engagement. By addressing these trust dynamics, the research provides practical implications for strengthening e-commerce reliability and boosting online shopping behavior in Malaysia.*

**Keywords:** *Security, Privacy, Reliability, Transparency, Consumer Trust.*

## Introduction

### *Research Background*

The rapid expansion of e-commerce has revolutionized consumer purchasing behavior globally, with Malaysia being no exception. In the Malaysian context, the dynamics of online shopping are influenced by a unique interplay of factors such as internet accessibility, mobile penetration, and digital connectivity. These factors, combined with critical trust elements like security, privacy, transparency, and reliability, play a crucial role in shaping consumer confidence and engagement in online transactions.

Recent studies have underscored the importance of these trust factors in online shopping behaviors across different regions, including Malaysia. Security remains a primary concern, as consumers increasingly demand robust protections against cyber threats and data breaches. Privacy concerns are also paramount, particularly in Malaysia, where consumer awareness of data protection laws, such as the Personal Data Protection Act (PDPA), is growing. The assurance that personal data is handled with care and confidentiality is essential for fostering trust and encouraging online transactions (Hall et al., 2023).

Transparency in business practices, including clear communication about product information, pricing, and return policies, is another critical factor that influences consumer trust in Malaysia. This transparency is crucial in a market where consumers often rely on online reviews and word-of-mouth recommendations to make purchasing decisions. Additionally, the reliability of e-commerce platforms, reflected in the consistent delivery of goods and services, is a significant determinant of consumer satisfaction and loyalty. Reliable platforms that meet or exceed customer expectations are more likely to retain customers and encourage repeat purchases (Honora et al., 2023).

The Malaysian online shopping landscape also reflects broader global trends, where trust factors are pivotal in influencing consumer behavior. However, the specific cultural and economic context of Malaysia

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<sup>1</sup> Faculty of Business and Communication, INTI International University, Malaysia.

<sup>2</sup> Faculty of Business, Accounting and Law, SEGi University Kota Damansara, Malaysia

<sup>3</sup> Faculty of Business and Communication, INTI International University, Malaysia, School of Economics and Management, Longyan University, Longyan, China

<sup>4</sup> Faculty of Economics and Business, Universitas Negeri Padang, Padang, Indonesia

introduces additional layers of complexity, making it essential to understand how these trust elements interact with local consumer preferences and behaviors. The role of digital connectivity, for instance, is particularly relevant in Malaysia, where mobile devices are the primary means of internet access for many consumers. This high mobile penetration rate makes it imperative for online businesses to optimize their platforms for mobile use, ensuring that security, privacy, and reliability are seamlessly integrated into the mobile shopping experience (Macready et al., 2020; Liu et al., 2022).

### *Literature Review*

#### *Factors Influencing Consumer Trust in Online Shopping Behavior*

##### *Trust in Online Transactions*

Trust is a fundamental element in the success of online transactions, playing a pivotal role in shaping consumer behavior and influencing the overall effectiveness of e-commerce platforms. In the context of online transactions, trust refers to the consumer's confidence that an e-commerce platform will honor its promises, protect personal and financial information, and deliver products or services as advertised. This concept is especially critical in digital environments where traditional face-to-face interactions are absent, and trust must be established through digital cues and signals (SENATHIRAJAH et al., 2024).

The importance of trust in online transactions is significant. Trust mitigates the perceived risks associated with online shopping, such as potential fraud, data breaches, or misrepresentation of products. Research indicates that when consumers perceive an e-commerce platform as trustworthy, they are more likely to provide personal and payment information, complete transactions, and return for future purchases (Liu & Zhang, 2022). Conversely, a lack of trust can result in abandoned shopping carts, reduced sales, and a tarnished reputation for the platform (Honora, Chih, & Ortiz, 2023). Therefore, building and maintaining consumer trust is crucial for the success and sustainability of e-commerce businesses.

Trust influences various aspects of online shopping behavior. Initially, consumers evaluate the trustworthiness of a platform based on factors such as website design, security features, and third-party endorsements. Platforms that effectively communicate their security measures and offer a user-friendly experience are more likely to instill trust in consumers (Hall, Dominguez, & Mihailova, 2023). High levels of trust not only encourage initial purchases but also foster repeat business and customer loyalty. Consumers who trust a platform are more inclined to share positive experiences, contributing to favorable word-of-mouth and enhanced brand reputation.

Moreover, the evolving nature of technology and emerging threats continuously shape the landscape of online trust. Advances in encryption, secure payment systems, and fraud detection enhance consumer confidence by addressing concerns about data security. However, new challenges such as sophisticated phishing attacks and data breaches necessitate ongoing adaptation of trust-building strategies (Liu & Zhang, 2022). As e-commerce continues to grow and evolve, understanding these dynamics and addressing trust-related issues will remain critical for maintaining consumer confidence and achieving long-term success in the digital marketplace.

In summary, trust is a crucial component in online transactions, influencing consumer engagement, purchasing decisions, and long-term loyalty. Addressing key factors such as security, privacy, transparency, and reliability is essential for e-commerce platforms to thrive in a competitive digital environment. Ongoing research into the dynamics of online trust will be vital for developing effective strategies to build and sustain consumer confidence (Honora, Chih, & Ortiz, 2023; Hall, Dominguez, & Mihailova, 2023).

##### *Security in Online Transactions*

Security is a cornerstone of trust in online transactions, encompassing a range of technologies and practices designed to protect consumer data and ensure safe financial exchanges. Secure payment systems are fundamental to this effort. Technologies such as Secure Socket Layer (SSL) encryption create a secure

channel between a consumer's browser and the e-commerce server, safeguarding sensitive information during transmission (Nakamura et al., 2022). Compliance with Payment Card Industry Data Security Standard (PCI DSS) is also crucial; these standards mandate rigorous data protection measures, including encryption of stored cardholder data and regular security testing, to prevent unauthorized access (Smith et al., 2023). Tokenization further enhances security by replacing sensitive payment information with unique tokens, reducing the risk of data breaches (Brown & Davis, 2021). Biometric authentication, including fingerprint and facial recognition, adds another layer of protection, providing a secure and user-friendly method for transaction authorization (Lee et al., 2024).

Encryption technologies play a pivotal role in protecting consumer data from unauthorized access. The Advanced Encryption Standard (AES) is widely utilized for encrypting sensitive data such as payment information, ensuring its confidentiality (Chen et al., 2022). Public Key Infrastructure (PKI) employs a pair of cryptographic keys—public and private—to secure communications, allowing safe data transmission between consumers and e-commerce platforms (Gonzalez et al., 2023). End-to-end encryption (E2EE) further secures data by encrypting it throughout its journey from origin to destination, protecting it from potential breaches during transmission (Smith et al., 2023).

Fraud protection measures are also essential for preventing and addressing fraudulent activities in online transactions. Fraud detection systems leverage machine learning and artificial intelligence to analyze transaction patterns and identify suspicious activities in real-time (Gonzalez et al., 2023). Two-factor authentication (2FA) enhances security by requiring users to provide two forms of identification before completing transactions, such as a password and a verification code sent to a mobile device (Chen et al., 2022). Additionally, transaction monitoring tools assess factors like transaction location, frequency, and amount to detect and prevent potential fraud (Brown & Davis, 2021).

In conclusion, the integration of secure payment systems, advanced encryption technologies, and robust fraud protection measures is crucial for maintaining consumer trust and ensuring the security of online transactions. As cyber threats continue to evolve, ongoing advancements and adherence to best practices in these areas remain essential for safeguarding consumer data and sustaining the integrity of e-commerce platforms (Nakamura et al., 2022; Smith et al., 2023).

### *Privacy Concerns in Online Transactions*

Privacy concerns are central to consumer trust in online transactions, encompassing how consumer data is collected, stored, used, and protected by e-commerce platforms. As digital transactions proliferate, understanding these concerns is crucial for maintaining consumer confidence and ensuring compliance with privacy standards.

E-commerce platforms collect a vast amount of consumer data, including personal identification details, payment information, browsing behavior, and purchase history. This data is often used to enhance user experiences through personalized recommendations, targeted marketing, and improved service offerings. However, the handling of this data raises significant privacy concerns. Consumers are increasingly aware of how their data is collected and utilized, and many are concerned about potential misuse or unauthorized access (Jiang et al., 2023). The storage of consumer data must be secure, with robust measures in place to prevent unauthorized access or data breaches. Data anonymization and encryption are common practices employed to protect sensitive information and mitigate risks associated with data storage (Zhang et al., 2024).

Transparent privacy policies are essential for building and maintaining consumer trust. Privacy policies inform users about what data is collected, how it is used, and to whom it may be shared. Clear and accessible privacy policies help consumers understand their rights and the measures taken to protect their data. Studies have shown that when e-commerce platforms provide detailed and transparent privacy policies, consumers are more likely to trust and engage with the platform (Wang & Liu, 2022). Effective privacy policies also include information about user consent, data retention periods, and mechanisms for users to control their data, such as opting out of data collection or deleting their information.

Regulations and compliance play a critical role in shaping data protection practices and influencing consumer trust. Laws such as the General Data Protection Regulation (GDPR) in the European Union and the Personal Data Protection Act (PDPA) in Malaysia set stringent requirements for data protection and privacy. The GDPR mandates that organizations obtain explicit consent from users before collecting personal data and provides individuals with rights such as data access, rectification, and erasure (Smith et al., 2022). Compliance with these regulations is not only a legal obligation but also a key factor in fostering consumer trust. Platforms that adhere to data protection laws demonstrate a commitment to safeguarding user privacy, which enhances their reputation and credibility (Jones et al., 2023).

In addition to legal requirements, the enforcement of data protection regulations ensures that e-commerce platforms adhere to privacy standards and address consumer concerns effectively. Regulatory bodies are empowered to investigate data breaches, impose fines, and mandate corrective actions, which reinforces the importance of compliance and accountability in data protection practices (Lee et al., 2023).

In summary, privacy concerns in online transactions are critical for maintaining consumer trust. E-commerce platforms must adopt transparent privacy policies, implement robust data protection measures, and comply with regulations such as the GDPR and PDPA to address these concerns effectively. By prioritizing data privacy and adhering to legal standards, platforms can enhance consumer confidence and foster long-term engagement in the digital marketplace (Jiang et al., 2023; Wang & Liu, 2022; Smith et al., 2022).

### *Transparency in Online Transactions*

Transparency is a fundamental aspect of building and maintaining consumer trust in online transactions. It encompasses several critical elements, including the accuracy of product information, clarity of pricing and policies, and adherence to ethical practices. By ensuring transparency, e-commerce platforms can foster greater consumer confidence and loyalty.

Accurate and detailed product information is crucial for consumer trust. When online platforms provide comprehensive descriptions of products, including specifications, features, and high-quality images, they help consumers make informed purchasing decisions. Studies indicate that detailed product information reduces the uncertainty associated with online shopping, thereby enhancing consumer satisfaction and trust (Zhao et al., 2023). For instance, platforms that offer user reviews, ratings, and comparative information enable consumers to assess product quality and suitability, further reinforcing their confidence in the purchase process (Kumar et al., 2024). The inclusion of return policies and warranty details also contributes to transparency, as it clarifies the terms under which consumers can seek redress or replacements.

Transparent pricing is another critical factor influencing consumer trust. Clear and upfront pricing helps avoid hidden fees or unexpected charges that can erode consumer confidence. Research highlights that when e-commerce platforms display all relevant costs, including shipping, taxes, and handling fees, consumers are more likely to trust the platform and proceed with transactions (Smith & Li, 2022). Additionally, transparent pricing practices foster a sense of fairness and integrity, as consumers are assured that they are paying the agreed-upon amount without additional surcharges (Brown & Davis, 2023). Platforms that use straightforward pricing models and provide detailed breakdowns of costs further enhance transparency and consumer trust.

Ethical practices and transparency in supply chain operations significantly impact consumer trust. Consumers increasingly demand that companies operate ethically and adhere to sustainable practices. Transparent disclosure of supply chain information, such as sourcing origins, labor practices, and environmental impact, allows consumers to make more ethical purchasing decisions (Jones et al., 2023). Research has shown that platforms that openly communicate their commitment to ethical practices, including fair trade and eco-friendly initiatives, build stronger consumer trust and loyalty (Lee et al., 2024). By highlighting their ethical standards and supply chain transparency, companies not only comply with consumer expectations but also differentiate themselves in a competitive market.

In summary, transparency in online transactions is essential for fostering consumer trust and engagement. Accurate product information, clear and upfront pricing, and ethical supply chain practices all contribute to a transparent and trustworthy e-commerce environment. As consumers become more informed and concerned about the ethical implications of their purchases, e-commerce platforms must prioritize transparency to build and maintain confidence and loyalty in the digital marketplace (Kumar et al., 2024; Zhao et al., 2023; Smith & Li, 2022).

### *Reliability in Online Transactions*

Reliability is a critical component in establishing and maintaining consumer trust in online transactions. It encompasses various aspects, including timely and accurate delivery of products, the precision of product descriptions, and the effectiveness of customer service. Ensuring reliability in these areas can significantly enhance consumer confidence and satisfaction in e-commerce platforms.

Timely and accurate product delivery is fundamental to reliability in online transactions. Delays or inaccuracies in delivery can lead to consumer dissatisfaction and erode trust. Research indicates that consumers have high expectations for prompt delivery, and failure to meet these expectations can result in negative reviews and decreased customer loyalty (Wang et al., 2023). Efficient logistics and robust supply chain management are essential for ensuring that products are delivered on time and in good condition. Studies have shown that platforms that provide accurate delivery estimates and real-time tracking information are more likely to build trust with their customers, as they offer transparency and reliability throughout the delivery process (Chen & Lee, 2024). Moreover, addressing delivery issues promptly and effectively can mitigate the impact of any problems that arise, reinforcing consumer trust.

Accurate product descriptions are another crucial element of reliability. Consumers rely on product descriptions to make informed purchasing decisions, and discrepancies between the description and the actual product can lead to dissatisfaction and returns. Detailed and precise product descriptions, including specifications, dimensions, and features, help set accurate expectations and reduce the risk of post-purchase dissonance (Smith & Liu, 2023). Research highlights that comprehensive product information not only aids in decision-making but also contributes to a sense of reliability and trustworthiness in the e-commerce platform. Accurate descriptions minimize the likelihood of misunderstandings and enhance the overall consumer experience (Brown & Davis, 2022).

Effective customer service plays a pivotal role in reinforcing reliability. High-quality customer service ensures that consumer issues and inquiries are addressed promptly and effectively. Research shows that responsive and supportive customer service can significantly enhance consumer trust and satisfaction (Johnson et al., 2023). This includes providing multiple channels for support, such as live chat, email, and phone, and ensuring that customer service representatives are well-trained and knowledgeable. Furthermore, a proactive approach to customer service, such as follow-ups and resolution of issues, can build strong relationships with consumers and foster long-term loyalty (Lee et al., 2024). Effective customer service also involves handling complaints and returns smoothly, which contributes to a positive overall experience and reinforces the platform's reliability.

In summary, reliability in online transactions is crucial for consumer trust and satisfaction. Ensuring timely and accurate delivery, providing precise product descriptions, and offering effective customer service are key components of reliability. By focusing on these aspects, e-commerce platforms can enhance consumer confidence, reduce dissatisfaction, and build long-term loyalty in the competitive digital marketplace (Chen & Lee, 2024; Johnson et al., 2023; Wang et al., 2023).

### *Online Shopping Behavior in Malaysian Context*

The context of Malaysia presents unique dynamics that influence trust in e-commerce. High mobile penetration, growing internet access, cultural factors, and socio-economic conditions collectively shape online shopping behaviors and trust. Understanding these factors is crucial for comprehending the e-commerce landscape in Malaysia and its implications for consumer trust.

High mobile penetration and expanding internet access are significant factors affecting trust in e-commerce in Malaysia. The country has witnessed a rapid increase in mobile device usage and internet connectivity, which has transformed the way Malaysians engage with online platforms. According to recent data, Malaysia boasts one of the highest mobile penetration rates in Southeast Asia, with over 90% of the population using mobile phones (Kaur & Singh, 2023). This widespread mobile usage underscores the importance of mobile-friendly e-commerce platforms that offer secure and seamless experiences. Consumers are more likely to trust platforms that provide user-friendly mobile interfaces, secure payment options, and reliable customer service through mobile channels (Tan & Yusof, 2024). Furthermore, increasing internet access has facilitated the growth of e-commerce by enabling more consumers to participate in online shopping, thereby influencing trust dynamics through the availability of a broader range of choices and competitive options.

Cultural factors also play a pivotal role in shaping trust in Malaysian e-commerce. Malaysia's collectivist culture emphasizes the importance of community and social networks, which significantly influences consumer behavior. In this context, word-of-mouth recommendations and social proof are powerful drivers of trust (Lim & Ho, 2023). Consumers in Malaysia often rely on feedback from friends, family, and online communities when making purchasing decisions. This cultural reliance on communal feedback highlights the importance of transparency and reliability in building trust. E-commerce platforms that actively engage with local communities, seek feedback, and demonstrate a commitment to ethical practices are likely to build stronger consumer trust. Additionally, cultural norms related to social harmony and reputation mean that businesses must be particularly cautious in maintaining a positive image and addressing any issues promptly to avoid negative word-of-mouth (Chong & Tan, 2024).

Socio-economic factors also influence online shopping behavior and trust in Malaysia. The country's growing middle class and increasing disposable income have contributed to a surge in online shopping. As more Malaysians have access to financial resources and technological tools, their expectations for e-commerce platforms have risen (Jalil & Ahmad, 2023). Consumers are now more demanding in terms of product quality, delivery performance, and customer service. Additionally, socio-economic disparities can affect trust, as lower-income consumers may have different expectations and concerns regarding online transactions compared to higher-income groups. Addressing these diverse needs through tailored services and transparent practices can enhance trust across different socio-economic segments.

In summary, the Malaysian context presents a complex interplay of factors affecting e-commerce trust. High mobile penetration and internet access have expanded online shopping opportunities, while cultural factors such as collectivism and reliance on social feedback shape trust dynamics. Socio-economic conditions further influence consumer expectations and behavior. Understanding these contextual elements is essential for e-commerce platforms seeking to build and maintain trust in Malaysia's evolving digital marketplace (Kaur & Singh, 2023; Lim & Ho, 2023; Tan & Yusof, 2024).

### *Research Framework and Hypotheses*

The research framework centers on four independent variables (IVs): security, privacy, transparency, and reliability. These factors are hypothesized to impact consumer trust, which serves as the mediating variable in this model. The dependent variable (DV) is online shopping behavior. The study proposes the following hypotheses:

Security encompasses measures such as secure payment systems, encryption technologies, and protection against fraud. It is hypothesized that higher levels of perceived security will lead to increased consumer trust in online shopping platforms. This trust, in turn, is expected to encourage more frequent and engaged online shopping behavior.

#### **H1: Security positively influences consumer trust in online shopping behavior.**

Privacy concerns involve how consumer data is collected, stored, and used by e-commerce platforms. If consumers perceive that their privacy is not adequately protected or if they are uncertain about how their

data is managed, this negative perception can diminish their trust. Lower consumer trust is anticipated to negatively impact their online shopping behavior.

## **H2: Privacy negatively affects consumer trust in online shopping behavior.**

Transparency refers to how openly and honestly an e-commerce platform communicates with consumers regarding product information, pricing, and policies. When e-commerce platforms demonstrate transparency in their operations and supply chains, it is hypothesized that this openness will enhance consumer trust. As a result, higher trust levels are expected to positively influence online shopping behavior.

## **H3: Transparency positively impacts consumer trust in online shopping behavior.**

Reliability includes consistent delivery performance, accurate product descriptions, and effective customer service. A reliable e-commerce platform builds consumer confidence by consistently meeting or exceeding expectations. This reliability is expected to foster higher consumer trust, which should translate into increased online shopping activity.

## **H4: Reliability positively affects consumer trust in online shopping behavior.**

Consumer trust is proposed as a mediating variable that bridges the impact of security, privacy, transparency, and reliability on online shopping behavior. It is hypothesized that increased consumer trust will lead to more frequent and engaged online shopping behavior, as trust enhances consumers' willingness to make purchases and continue shopping online.

## **H5: Consumer trust positively affects online shopping behavior.**

### **Research Methodology**

This study employs a cross-sectional analytical design to investigate the impact of trust factors on online shopping behavior, focusing on Malaysian consumers. The research aims to analyze how security, privacy, transparency, and reliability influence consumer trust and subsequently affect online shopping behavior.

The study will utilize a self-administered questionnaire, designed to gather data on the key variables of interest. The questionnaire is structured based on established scales from previous research (e.g., Karahoca et al., 2017; Amin, 2016; Zolkepli & Kamarulzaman, 2015) and will consist of two main sections. Section A will collect demographic information including age, gender, income level, and frequency of online shopping. Section B will include 30 items related to the study's variables such as security, privacy, transparency, reliability, consumer trust, and online shopping behavior using a five-point Likert scale (1 strongly disagree to 5 strongly agree).

The research sample will be drawn from the general population of online shoppers in Malaysia using non-probability purposive sampling. This method is chosen to ensure that participants have recent experience with online shopping and meet specific criteria. A total of 300 respondents will be targeted to provide a robust dataset for analysis. This sample size is determined based on Barclay et al.'s (1995) recommendation of having a sample size ten times the number of structural paths in the model and the minimum requirement of 100 respondents as suggested by Hair et al. (2017) for Structural Equation Modeling (SEM) using Smart PLS.

Participants will voluntarily take part in this study after providing informed consent. The questionnaire will be reviewed for content validity by experts in the field. Following this, a pilot test involving 30 participants will be conducted to refine the questionnaire and ensure clarity of the items (Kumar et al., 2013). The finalized questionnaire will be distributed electronically via Google Forms and promoted through various social media platforms to maximize reach and response rates.

Data analysis will be performed using Smart PLS 4.0 software. The analysis will proceed in two stages: First, evaluating the measurement model for reliability and validity, including internal consistency, convergent validity, and discriminant validity. Second, assessing the structural model to test the proposed hypotheses and examine the relationships between variables.

The study aims to provide insights into how factors like security, privacy, transparency, and reliability affect consumer trust and online shopping behavior. By employing a quantitative approach and SEM, this research seeks to offer valuable implications for e-commerce strategies in Malaysia.

## Results

### *Common Method Variance (CMV)*

Common Method Variance (CMV) can distort the results of a study by introducing systematic bias when data is collected from a single source. To evaluate the potential impact of CMV on this study, we utilized Harman's single-factor test (Harman, 1976), a commonly employed technique for assessing the presence of CMV.

An unrotated factor analysis was performed on the dataset, including all latent variables related to the study's constructs, security, privacy, transparency, reliability, consumer trust, and online shopping behavior. The purpose of this analysis was to identify the number of factors required to account for the variance in the data and to assess whether a single general factor explained a substantial portion of the variance.

The results of the factor analysis indicated that no single factor emerged as dominant, and a single factor did not account for the majority of the covariance among the measures. Specifically, the principal factor did not explain more than 25.19% of the total variance. This suggests that common method variance is unlikely to be a significant concern in this study, as the data did not exhibit substantial bias from a single source affecting the measurement outcomes.

By applying this methodological approach, we have addressed the potential for CMV and provided assurance that the study's results are reflective of the true constructs being measured rather than being unduly influenced by methodological artifacts.

### *Measurement Model*

To assess the construct validity of the proposed measurement model, this study evaluated the factor loadings for each indicator, following the guidelines set forth by Hair et al. (2010). Standardized loadings were expected to exceed a minimum of 0.5, with a target of 0.7 or higher, and needed to show significant p-values to confirm convergent validity. In addition, composite reliability (CR) was examined as a key measure of internal consistency, providing a more robust assessment than Cronbach's alpha. Hair et al. (2010) recommend that composite reliability should surpass 0.7 to indicate sufficient reliability of the latent constructs.

The study also calculated the average variance extracted (AVE) to evaluate both convergent and discriminant validity. As per Hair et al. (2010), the AVE for each construct should be greater than the squared correlations between constructs to support discriminant validity, with an AVE above 0.5 indicating satisfactory convergent validity.

The results showed that composite reliability values exceeded the required threshold, with scores of 0.779 for security, 0.802 for privacy, 0.808 for transparency, 0.777 for reliability, 0.833 for consumer trust and 0.828 for online shopping behavior. Additionally, the AVEs for all constructs surpassed the recommended levels, confirming both convergent and discriminant validity within the measurement model. Table 1 summarizes the results of the Confirmatory Factor Analysis (CFA) for all the measured constructs.

Table 1. the Measured Construct Confirmatory Factor Analysis (CFA)

Dimension	Items	Factor loading	Composite Reliability	AVE
Security	S1	0.862	0.779	0.639
	S2	0.731		
Privacy	P2	0.815	0.802	0.670
	P3	0.822		
Transparency	T1	0.813	0.808	0.585
	T2	0.707		
	T3	0.771		
Reliability	R1	0.788	0.777	0.541
	R2	0.616		
	R3	0.788		
Consumer Trust	CT1	0.742	0.833	0.625
	CT2	0.809		
	CT3	0.819		
Online Shopping Behavior	OSB2	0.827	0.828	0.706
	OSB3	0.853		

### *Structural Model and Hypothesis Testing*

Based on the results presented in Table 2, the study's findings reveal strong support for all five proposed hypotheses.

The relationship between security and consumer trust is statistically significant, with a t-value of 3.558 and a p-value of 0.000, indicating that higher levels of security positively influence consumer trust in online shopping behavior. Security is a fundamental factor in building consumer trust in online transactions. When consumers perceive that an e-commerce platform provides robust security measures, such as secure payment gateways, data encryption, and fraud prevention mechanisms, they are more likely to trust the platform. This trust, in turn, enhances their willingness to engage in online shopping. Previous research has consistently highlighted the importance of security in fostering consumer trust (Chen et al., 2015; Shareef et al., 2018). For example, Chen et al. (2015) found that perceived security directly impacts consumers' trust in e-commerce, which then influences their purchase intentions. Similarly, Shareef et al. (2018) emphasized that security concerns are among the top barriers to online shopping, and addressing these concerns is critical for building consumer trust. The significant t-value of 3.558 and p-value of 0.000 in this study further confirm that security is a critical determinant of consumer trust in online shopping.

Privacy concerns are a significant factor that can negatively impact consumer trust in online environments. With the increasing awareness of data breaches and the misuse of personal information, consumers may become more wary and less trusting of platforms that fail to offer robust privacy protections. This study identified a significant negative relationship between privacy and consumer trust, supported by a t-value of 2.506 and a p-value of 0.012. This finding is consistent with previous research, where insufficient privacy measures were found to erode consumer trust, leading to reluctance in engaging with online vendors (Bansal & Zahedi, 2015; Wu et al., 2018). For instance, Wu et al. (2018) highlighted that inadequate privacy safeguards can cause consumers to feel vulnerable, reducing their willingness to trust and interact with online platforms. Bansal and Zahedi (2015) also emphasized that the absence of clear and protective privacy policies can lead to a decline in consumer trust, ultimately affecting their online shopping behavior.

Transparency in e-commerce refers to the clear and honest communication of information, such as product descriptions, pricing, and company policies. When consumers perceive a platform as transparent, they are more likely to trust it, as they feel informed and assured that there are no hidden agendas. This study found a significant positive effect of transparency on consumer trust, with a t-value of 4.709 and a p-value of 0.000. This finding is consistent with previous research, which has identified transparency as a key driver of trust in online transactions (Gefen et al., 2003; Lee & Turban, 2020). Gefen et al. (2003) argued that transparent communication reduces uncertainty and enhances consumers' trust in e-commerce platforms. More recently, Lee and Turban (2020) emphasized that transparency in pricing and product information is crucial for building long-term consumer trust, particularly in the highly competitive online marketplace.

Reliability refers to the consistent delivery of promises made by the e-commerce platform, such as timely delivery, accurate product descriptions, and responsive customer service. This study found that reliability has the strongest impact on consumer trust, with a t-value of 8.722 and a p-value of 0.000. This finding is in line with the literature, which consistently underscores the importance of reliability in trust-building (McKnight et al., 2002; Chiu et al., 2014). McKnight et al. (2002) proposed that consumers are more likely to trust an online vendor if they consistently meet expectations in terms of product quality and service. Chiu et al. (2014) further demonstrated that reliability, particularly in the context of timely delivery and accurate product information, is a critical factor influencing consumer trust and, subsequently, their online shopping behavior.

Consumer trust is a pivotal factor in determining online shopping behavior. When consumers trust an e-commerce platform, they are more likely to engage in purchasing activities. The study found a significant positive relationship between consumer trust and online shopping behavior, with a t-value of 7.979 and a p-value of 0.000. This outcome is consistent with a substantial body of research that highlights trust as a key antecedent of online purchase intentions (Kim et al., 2008; Pavlou & Fygenon, 2006). Kim et al. (2008) found that trust significantly influences consumers' willingness to buy from an online store, particularly in high-risk contexts. Pavlou and Fygenon (2006) also emphasized that trust mediates the relationship between perceived risk and purchase behavior, underscoring its critical role in the online shopping process.

The  $R^2$  values for the independent variables indicate their respective contributions to explaining the variance in consumer trust within the context of online shopping behavior. The  $R^2$  value for security is 0.142, suggesting that 14.2% of the variance in consumer trust can be explained by security factors. This indicates a moderate influence of security on consumer trust, reflecting that consumers consider security measures an important aspect when engaging in online shopping.

Privacy shows an  $R^2$  value of 0.126, meaning that 12.6% of the variance in consumer trust is accounted for by privacy concerns. This value highlights the significance of privacy in fostering trust, though it is slightly less influential compared to security. Transparency, with an  $R^2$  value of 0.243, explains 24.3% of the variance in consumer trust, indicating a stronger influence. This suggests that clear and open communication about product information, pricing, and policies greatly enhances consumer trust.

Reliability has the highest  $R^2$  value at 0.394, which means that 39.4% of the variance in consumer trust is explained by reliability factors. This substantial effect underscores the critical role of reliable service delivery, accurate product descriptions, and effective customer service in building and maintaining consumer trust in online shopping environments.

Additionally, the  $Q^2$  value for online shopping behavior is 0.374, which exceeds zero, demonstrating that the model has predictive relevance. This value suggests that the exogenous variables; security, privacy, transparency, and reliability effectively predict consumer trust, which in turn influences online shopping behavior. These findings align with the framework that positions consumer trust as a pivotal mediator between these independent variables and online shopping behavior.

**Table 2. Evaluation of Structural Model Results**

Path		t-Statistic	P-value	Result
H1	Security-> Consumer Trust	3.558	0.000	Supported
H2	Privacy-> Consumer Trust	2.506	0.012	Supported
H3	Transparency-> Consumer Trust	4.709	0.000	Supported
H4	Reliability-> Consumer Trust	8.722	0.000	Supported
H5	Consumer Trust-> Online Shopping Behavior	7.979	0.000	Supported

## Conclusion

This study aimed to examine the impact of security, privacy, transparency, and reliability on consumer trust and, in turn, how consumer trust influences online shopping behavior. The findings confirmed that all four independent variables; security, privacy, transparency, and reliability significantly affect consumer trust, which subsequently influences online shopping behavior. Among these, reliability emerged as the most substantial predictor, emphasizing the importance of consistent and dependable service in building consumer trust. The results also highlighted the critical role of transparency, followed by security and privacy, in shaping trust. This research contributes to a deeper understanding of the factors that drive consumer trust in online environments, particularly in the context of Malaysia, where online shopping is rapidly growing.

## Practical Contributions

This study highlights several practical contributions for e-commerce businesses aiming to enhance consumer trust and online shopping behavior. Firstly, the findings emphasize the critical need for robust security measures. E-commerce platforms should prioritize the implementation of advanced security technologies, such as encryption and secure payment gateways, to protect consumer data. Effective security not only safeguards sensitive information but also builds consumer trust, which is essential for encouraging repeat business and mitigating the impact of potential security breaches (Verhagen et al., 2015).

Secondly, transparency in business practices plays a pivotal role in fostering consumer confidence. Companies are encouraged to adopt clear and comprehensive privacy policies and to openly communicate how customer data is collected, used, and protected. Transparent information regarding product features, pricing, and return policies also contributes significantly to consumer trust. Research indicates that such transparency helps enhance brand loyalty and consumer confidence (Lwin et al., 2017). Businesses should strive to make their privacy policies easily accessible and understandable to reassure customers about their data protection measures.

Reliability was also identified as a key factor influencing consumer trust. E-commerce platforms should focus on delivering consistent and dependable service, including timely product delivery and accurate product descriptions. Effective customer service that is responsive and reliable further contributes to a positive shopping experience. Reliable service not only retains existing customers but also generates positive word-of-mouth, which can attract new customers (Zeithaml et al., 2002).

Lastly, the study underscores the importance of building and maintaining consumer trust as a mediator in the relationship between trust factors and online shopping behavior. Businesses should invest in fostering trust through ethical practices, high-quality customer service, and effective communication strategies. By doing so, they can enhance customer satisfaction and increase engagement in online shopping activities (Gefen et al., 2003).

### Future Recommendations

Future research should address several areas to further advance the understanding of consumer trust in e-commerce. One recommendation is to explore the impact of emerging technologies, such as blockchain and artificial intelligence, on security, privacy, and transparency in online transactions. Blockchain could offer secure and transparent transaction methods, while AI could enhance personalized customer experiences and fraud detection. Investigating these technologies could provide valuable insights into strengthening consumer trust and addressing new challenges in the digital marketplace (Xu et al., 2019).

Additionally, conducting longitudinal studies would be beneficial to assess how consumer trust and online shopping behavior evolve over time. Tracking changes in consumer perceptions and behaviors in response to technological advancements and regulatory changes would offer a deeper understanding of the long-term effects of trust factors on online shopping (Nguyen et al., 2020).

Cross-cultural research is another area for future exploration. Understanding how cultural differences influence the relationship between trust factors and online shopping behavior can help businesses tailor their strategies to diverse markets. Such research would provide insights into how different cultural contexts affect consumer trust, aiding in the development of global e-commerce practices (Hofstede, 2001).

Finally, including additional mediating variables, such as consumer satisfaction, perceived value, or brand reputation, in future studies could offer a more nuanced understanding of online shopping behavior. Investigating how perceived value interacts with consumer trust could reveal important insights into the relative importance of different trust factors in shaping purchase decisions (Oliver, 1980). Addressing these recommendations will contribute to a more comprehensive understanding of consumer trust in online environments and help e-commerce businesses enhance their strategies to meet the evolving needs and expectations of consumers.

### Authors' Contributions

All authors have showcased remarkable commitment by actively dividing their responsibilities and working together to accomplish these research studies.

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### Conflict of Interest

The authors declare no conflict of interest.

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