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MODELING THE EFFECTS OF CHATBOT RESPONSIVESS, USEFULNESS, AND PERCEIVED RISK ON E-COMMERCE USER SATISFACTION AND BEHAVIORAL INTENTION

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ABSTRACT

As e-commerce grows quickly in Indonesia, more businesses are using AI chatbots to make their services more efficient and available. These chatbots are meant to provide quick, useful answers that can improve the customer experience and encourage people to keep using the service. Still, many users worry about how reliable chatbots are, whether their data is safe, and if the responses are accurate. These concerns can make people feel there is a high risk, which may lower their satisfaction and make them less likely to keep using the service. Although past studies have looked at these issues one at a time, there is research that examines them together. This study aims to analyze the influence of chatbot responsiveness, usability, and risk perception on user satisfaction and behavioral intentions, and to examine the mediating role of satisfaction in these relationships. This study used a quantitative approach with 403 active e-commerce users from Shopee, Tokopedia, Lazada, and Blibli. Data analysis was carried out using the Partial Least Squares Structural Equation Modeling (PLS-SEM) method with SmartPLS 4. To add depth to the findings, qualitative guerrilla interviews were also conducted to capture real user experiences. This result found that when chatbots are responsive and easy to use, customers are more satisfied and more likely to act positively. However, if customers feel there is risk, their satisfaction drops. Customer satisfaction partly explains how these factors affect what people do, but it does not account for everything. The study showed that when chatbots are responsive and helpful, users are more satisfied and more likely to use them again. However, if users feel there is a high risk, their satisfaction drops. These results help explain how people in emerging markets adopt AI chatbots and offer useful guidance for e-commerce companies looking to design more trustworthy, reliable chatbots.

Keywords: *E-Commerce, Chatbot, Responsiveness, Usefulness, Perceived Risk, User Satisfaction*

1. INTRODUCTION

Digital technology is quickly changing how businesses interact with customers, especially in e-commerce. In Indonesia, e-commerce is expanding, reaching a Gross Merchandise Value of USD 65 billion in 2024, an 11% rise from the previous year (e-Conomy SEA, 2024). This shows that more Indonesians are using online marketplaces like Shopee, Tokopedia, Lazada, and Blibli. At the same time, more online transactions have resulted in more customer complaints. In 2023, the Indonesian Ministry of Trade reported that about 91% of the over 7,000 e-commerce complaints concerned customer service, including delayed refunds, incomplete responses, and slow complaint handling. With so many user complaints, the implementation of a chatbot information system is no longer an optional feature but has become a crucial core component of e-commerce platform infrastructure due to its direct impact on the user experience.

Looking at existing e-commerce platforms, all have implemented chatbot features to assist users. However, it is also known that many users have complaints when using these chatbots. The main complaint was that the answers to their questions were still very template-like, making the chatbot's responses less relevant in helping solve their problems. Furthermore, when it came to financial questions, some users expressed concerns about data leaks and loss of funds. These concerns have the potential to lower their satisfaction levels and also affect users' intention to reuse chatbot services, even those on e-commerce platforms

Number	Writer and Title	Main Result	Variable				
			Responsiveness	Usefulness	Perceived Risk	Customer Satisfaction	Behavior Intention
1	Marjerison, R. K., Dong, H., Kim, J.-M., Zheng, H., Zhang, Y., & Kuan, G. (2025) Understanding User Acceptance of AI-Driven Chatbots in China's E-Commerce: The Roles of Perceived Authenticity, Usefulness, and Risk	The authenticity and usability of AI chatbots positively influence user acceptance; perceived risk decreases usage intensity.		v	v		v
2	Dai & Liu. (2024) Impact of artificial intelligence on consumer buying behaviors: Study about the online retail purchase	AI increases consumer purchase intent through AI chatbot personalization, recommendations, and convenience in the purchasing process.				v	
3	Marjerison, R. K., Zhang, Y., & Zheng, H. (2022) AI in E-Commerce: Application of the Use and Gratification Model to The Acceptance of Chatbots	Perceived Usefulness has a positive impact on continuance intention, thus encouraging users to have the intention to reuse AI chatbots in online shopping activities in the future.	v	v			v
4	Chie et al. (2023) Customer satisfaction towards the application of artificial intelligence in e-commerce	AI in e-commerce significantly improves customer satisfaction through shopping support systems.				v	
5	Li, M., & Wang, R. (2023) Chatbots in e-commerce: The effect of chatbot language style on customers' continuance usage intention and attitude toward brand	The interactions provided by chatbots have a positive influence on customer loyalty towards brands that use AI chatbots.	v				v
6	Sundjaja, A. M., & Prio, B. A. (2025) The determinant factors of continuance use of customer service chatbot in Indonesia e-commerce: Extended expectation confirmation theory	Perceived Usefulness, Confirmation, and Satisfaction have a positive influence on Continuance Intention in using customer service chatbots.		v		v	v
7	Zhang, Y., & Wang, X. (2025) A study on the factors that influence consumers' continuance intention to use artificial intelligence chatbots in a pharmaceutical e-commerce context	The technical characteristics of AI chatbots, such as flexibility, accuracy, reliability, and convenience, have a positive influence on the confirmation of service expectations.		v		v	v
8	Silva, S. C., De Cicco, R., Vlačić, B., & Elmashhara, M. G. (2023) Using chatbots in e-retailing: How to mitigate perceived risk and enhance the flow experience	Perceived Risk has a negative influence on behavioral intentions, but its influence can be minimized through increasing trust.			v		v
9	Zakaria, I., Jaber, R., Dwaikat, F., & Abu-Kweik, A. (2024) Infinite Potential of AI Chatbots: Enhancing User Experiences and Driving Business Transformation in E-commerce: Case of Palestinian E-Commerce	The quality of AI chatbot services has a significant impact on user satisfaction and intention to continue using the chatbot.				v	v
10	Rana & Jain. (2024) Utility and Acceptability of AI-Enabled Chatbots on the Online Customer Journey in E-Retailing	AI chatbots are well-received in e-retailing and enhance the customer experience throughout the customer journey.		v		v	
11	Audrey Esther Lita & Viany Utami Tjhin (2025) Modelling The Effects of Chatbot Responsiveness, Usefulness, and Perceived Risk on E-Commerce User Satisfaction and Behavioral Intention	The Impact of AI Chatbot Implementation on E-Commerce User Satisfaction and Repurchase Intention	v	v	v	v	v

Figure 1: The Gap of The Previos Studies

Several previous studies have analyzed chatbot implementation in digital services using the Technology Acceptance Model (TAM) and Service Quality (SERVQUAL) approaches. However, most studies focused on only one variable, such as chatbot usability, but failed to address the response, which is also important for chatbot users on e-commerce platforms. Furthermore, there is still a paucity of research examining perceived user concerns and risks. Furthermore, research examining the impact of chatbot implementation for e-commerce in Indonesia is still very limited. These shortcomings indicate gaps in previous research that need to be explored further and supplemented.

This study aims to address the gaps in previous research by conducting a more in-depth and comprehensive analysis of the influence of chatbot quality and perceived risk on user satisfaction and behavioral intentions in the Indonesian e-commerce context, specifically Shopee, Tokopedia, Blibli, and Lazada. This in-depth analysis of chatbot quality will further examine usability and chatbot responsiveness during interactions. Furthermore, perceived risk will be discussed, focusing on user perceptions of chatbot security and trustworthiness. To support the a fore mentioned analysis, this study will employ a quantitative approach, supplemented by a qualitative approach. The quantitative approach will utilize a survey of 403 respondents and Partial Least Squares-Structural Equation Modeling (PLS-SEM) analysis. For the qualitative approach, guerrilla interviews will be conducted to further strengthen and deepen the findings from the quantitative analysis. Figure 1 shows the gap of the previous studies.

The results of this analysis are expected to answer several questions related to chatbots, such as: (1) How does chatbot usefulness align with user needs? (2) How can chatbot responsiveness influence user satisfaction? (3) How does perceived risk influence user satisfaction and behavioral intentions? (4) What is the role of customer satisfaction in mediating chatbot quality with behavioral intention? (5) How does customer satisfaction can influence the behavioral intention?

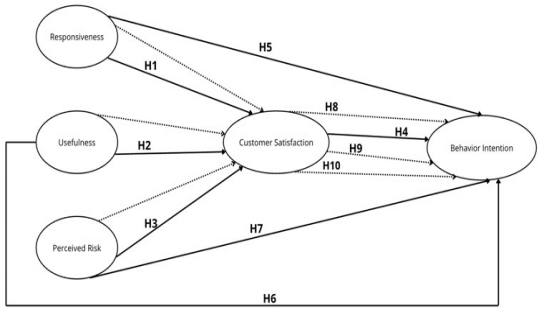
Based on the questions answered, this research is expected to provide theoretical contributions by providing insights into information systems through the integration of service quality and technology acceptance perspectives in the context of chatbots on e-commerce platforms. Practically, this research is also expected to serve as a guide for e-commerce platform managers in designing and improving chatbot features as a more effective and responsive digital user service system, while also building user trust, thereby increasing satisfaction and impacting user intentions to continue using the platform.

2. LITERATURE REVIEW

2.1 E-Commerce in Indonesia

Information technology has grown rapidly, helping e-commerce expand in Indonesia. Easier internet access, new consumer habits, and the use of mobile devices are the main reasons for this growth. Research conducted by Gajewska et al. (2020) found that e-commerce will shape future business trends. In Indonesia, platforms like Shopee, Tokopedia, Blibli, and Lazada lead the market. Because competition is high, companies need to stand out by offering fast and reliable customer service.

Figure 2: Proposed Conceptual Model



2.2 E-Service Quality in E-Commerce

E-service quality plays a crucial role in customer satisfaction when shopping online. Factors such as prompt responses, clear information, secure transactions, and user-friendly websites contribute to a better experience. Silvia and Adhitya (2021) show that good e-service quality has a significant impact on customer satisfaction. If a company is slow to respond or handles complaints poorly, customers may lose loyalty. This highlights the importance of providing reliable and efficient service for online businesses.

2.3 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) helps explain why people choose to use new technologies by focusing on how useful and easy to use they find them. In e-commerce, researchers have applied TAM to understand how users adopt tools like AI chatbots. For instance, Lim An Chie et al. (2023) combined TAM with service quality to study customer satisfaction with digital AI services. Similarly, Purwanto and Budiman (2020) used TAM to explore how chatbots can improve user interactions and experiences in online shopping.

2.4 Artificial Intelligence in E-Commerce

Artificial Intelligence (AI) is currently transforming the e-commerce industry by facilitating personalized experiences, intelligent product recommendations, and automated services. Xulong Dai et al. (2024) found that AI-based personalization significantly impacts user satisfaction. Similarly, Lim An Chie et al. (2023) found that AI-based features, such as chatbots and recommendation engines, can improve the overall user journey, enabling companies to offer more targeted and efficient customer support tailored to user needs.

2.5 Hypotheses Development and the Proposed Conceptual Model

This study develops an integrated model examining how AI-based chatbot attributes, such as responsiveness, usability, and perceived risk influence customer satisfaction and behavioral intentions on e-commerce platforms in Indonesia. Based on the SERVQUAL model, the Technology Acceptance Model (TAM), and supporting empirical literature, the authors propose ten hypotheses, including a mediating effect through customer satisfaction. Figure 2 shows the conceptual model in this study.

2.6 Chatbot Responsiveness

Chatbot responsiveness is the speed and accuracy with which a chatbot answers user questions in real time. In e-commerce, being responsive helps improve customer perceptions of service quality by reducing wait times and resolving issues quickly. Several studies have shown that responsiveness shapes how users feel and act. For example, Mahalli et al. (2025) found that Shopee's chatbot responsiveness increased user satisfaction. Siregar & Siregar (2025) identified responsiveness as a main factor in digital service quality. Suparman (2024) noted that quick replies improve the user experience, and Sundjaja & Prio (2025) found that timely responses encourage users to use chatbot services again. Based on these findings, responsiveness is likely to positively affect customer satisfaction and future behavior.

H1: Chatbot responsiveness has a positive effect on customer satisfaction.

H5: Chatbot responsiveness has a direct positive effect on behavioral intention.

2.7 Chatbot Usefulness

In the Technology Acceptance Model (TAM), usefulness means how much users believe a technology will help them perform tasks better. For chatbots, this relates to whether users think chatbot interactions make shopping more efficient and improve their experience. Usefulness includes how relevant and accurate the information is, and how well the chatbot solves problems. Research has shown that usefulness is important for shaping how users see chatbots. For example, Marjerison et al. (2025) and Hamsar et al. (2024) found that chatbot usefulness increases user satisfaction in China and Indonesia. Rana et al. (2024) also noted that informative chatbot features improve user experience. Marjerison et al. (2022) found that usefulness strongly predicts whether people will keep using AI-based services. Dai and Liu (2024) showed that useful chatbot features directly affect users' intentions to shop online. Based on these findings, the following hypotheses are suggested:

H2: Chatbot usefulness has a positive effect on customer satisfaction.

H6: Chatbot usefulness has a direct positive effect on behavioral intention

2.8 Perceived Risk in Chatbot

Perceived risk is the uncertainty and possible negative outcomes users might experience when using chatbots, especially regarding privacy, accuracy, and reliability. Research shows that perceived risk can negatively affect how users feel about chatbots. For example, Silva et al. (2023) found that when users feel more at risk, they are less satisfied with e-retailing chatbots. Marjerison et al. (2025) and Zakaria et al. (2024) also observed that concerns about data security and information accuracy can make users feel less comfortable and satisfied. High perceived risk may even prevent people from using chatbot services again. According to Zhang & Wang (2025), users who feel at risk are less likely to continue using AI-based chatbots. Dai & Liu (2024) found that perceived risk can also stop users from making decisions when shopping online.

H3: Perceived risk has a negative effect on customer satisfaction.

H7: Perceived risk negatively affects behavioral intention.

2.9 Customer Satisfaction

Customer satisfaction is a key predictor of behavioral intention, as satisfied users are more likely to continue using and recommend an e-commerce platform. In e-commerce, satisfied customers are more likely to make repeat purchases and recommend the platform to others. This is supported by research conducted by Li & Wang (2023), who found that satisfaction with chatbots strongly predicted intention to continue using, and by Zhang & Wang (2025), who confirmed a positive relationship between satisfaction and behavioral intention. Chie et al. (2023) also noted that satisfaction with AI services increases brand loyalty. Satisfaction also mediates the influence of chatbot features on user behavior. Siregar & Siregar (2025) and Suparman (2024) showed that satisfaction strengthens the influence of responsiveness on intention. Similarly, Zhang & Wang (2025) and Marjerison et al. (2022) found that satisfaction bridges the relationship between usefulness and behavioral intention. Although perceived risk decreases satisfaction, Silva et al. (2023) and Zakaria et al. (2023) found that satisfaction mediates the effect of chatbot features on user behavior. (2024) reported that satisfaction can reduce its negative impact on behavioral intentions. Therefore, the following hypotheses are proposed:

H4: Customer satisfaction positively affects behavioral intention.

H8: Customer satisfaction mediates the relationship between chatbot responsiveness and behavioral intention.

H9: Customer satisfaction mediates the relationship between chatbot usefulness and behavioral intention.

H10: Customer satisfaction mediates the relationship between perceived risk and behavioral intention.

2.10 Behavioral Intention

Behavioral intention reflects a user's tendency to continue using a product or service. Research conducted by Dai and Liu (2024) argues that the ethical and transparent use of AI builds user trust, thereby increasing their purchase intention. Mahasari et al. (2024) also confirmed that chatbot adoption improves the product selection experience and positively influences user engagement with e-commerce platforms

2.11 Research Gap

Several previous studies like Li & Wang (2023), Zhang & Wang (2025), Marjerison et al. (2022), Silva et al. (2023) and Zakaria et al. (2023) have analyzed chatbot implementation in digital services using the Technology Acceptance Model (TAM) and Service Quality (SERVQUAL) approaches. However, most studies focused on only one variable, such as chatbot usability, but failed to address the response and perceived risk which is also important for chatbot users on e-commerce platforms. Furthermore, there is still a paucity of research examining perceived user concerns and risks.

This study aims to address the gaps in previous research by conducting a more in-depth and comprehensive analysis of the influence of chatbot quality and perceived risk on user satisfaction and behavioral intentions. This in-depth analysis of chatbot quality will further examine usability and chatbot responsiveness during interactions. Furthermore, perceived risk will be discussed, focusing on user perceptions of chatbot security and trustworthiness.

2.12 Literature Screening Process

To ensure that the literature review in the study is relevant and has good academic quality to support this research, a literature selection process was also carried out using several filtering criteria. The literature search process for this research was carried out through searching indexed academic journal databases such as Scopus. Several criteria were considered, such as this study selected literature discussing the topic of chatbots, the scope of e-commerce, artificial intelligence in customer service, user satisfaction, usefulness variables, responsiveness, perceived risk, and user behavior. This study only used previous research references with a maximum publication year of the last 5 years, namely 2021 - 2025. This was done with the aim of ensuring that the theories and findings used can align with the latest developments in the topic of chatbots in E-Commerce. Using scientific publications such as Scopus-indexed journal articles, conference proceedings, and Scopus-indexed academic research reports. The literature used was previous research that used the quantitative approaches TAM, SERVQUAL and

PLS-SEM or qualitative research related to user experience relevant to chatbot adoption in E-Commerce. This study utilized previous publications in English or Indonesian to facilitate interpretation and ensure the completeness of the information analyzed. The application of these screening criteria aimed to ensure that the literature review was highly relevant to the research topic, namely the application of chatbots in e-commerce, and to support the development of a theoretical framework, research model, and systematic identification of research gaps.

3. METHODS

3.1 Data Collection

This study focuses on users of chatbot features across four major e-commerce platforms in Indonesia: Shopee, Tokopedia, Lazada, and Blibli. Therefore, the target population is defined as all monthly active users (MAU) of these platforms who have used the chatbot or live chat services. According to Katadata (2025), the combined MAU of the four platforms reaches approximately 251 million users. Based on an estimate that 20% of active users have used or frequently use chatbot services, the research population is calculated to be around 50,200,000 users. To determine the minimum sample size, the Slovin formula was applied with a margin of error of 5%. As a result, the required sample size for this study is 403 respondents, which is considered sufficient and representative of the overall population of chatbot users on Indonesia's leading e-commerce platforms.

The questionnaire was distributed online over a period of 14 days to active users of Shopee, Tokopedia, Lazada, and Blibli. This time frame ensured a balanced and diverse response from a broad segment of users familiar with chatbot interactions on each platform.

3.2 Instrument Development

This study gathered primary data through online questionnaires distributed via social media to active users of major e-commerce platforms in Indonesia. Respondents answered each question on a 4-point Likert scale from 1 (Strongly Disagree) to 4 (Strongly Agree). The quantitative data were analyzed with SmartPLS software to test the research hypotheses. Secondary data from earlier studies were also used to support the analysis and strengthen the research findings.

Table 1: Research Instrument

Variables	Indicator	Concept	Descriptions
Responsiveness	Speed of response	RS01	The chatbot responds quickly to e-commerce users' inquiries.
	Availability	RS02	The chatbot is always available for e-commerce users whenever needed.
	Chatbot's ability to answer complex questions.	RS03	The chatbot can answer complex questions and provide relevant information to e-commerce users.
Usefulness	Ease of Interaction	US01	The chatbot is easy for e-commerce users to use and understand during interactions.
	Relevance of Solutions	US02	The chatbot provides useful and relevant solutions or suggestions to e-commerce users.
	Efficiency	US03	The chatbot improves problem-solving efficiency, making the e-commerce shopping experience simpler for users.
Perceived Risk	Concern about Potential Loss	PR01	E-commerce users are concerned about potential losses or negative consequences when using the chatbot.
	Concern about Data Privacy	PR02	E-commerce users are concerned about the security and confidentiality of their data when interacting with the chatbot.
	Transactional Risks	PR03	The chatbot creates uncertainty and potential risks in e-commerce transactions.
Customer Satisfaction	Fulfilment of Customer Expectation	CS01	The chatbot performs as expected by e-commerce users.
	Satisfaction of the	CS02	E-commerce users are satisfied with the

	Chatbot Service		customer service provided through the chatbot.
	Comfort Interaction	CS03	The chatbot provides comfort for e-commerce users during interactions.
Behaviour Intention	Give Recommendation to others	BI01	E-commerce users recommend others to use e-commerce platforms that implement chatbots.
	Platform Reuse	BI02	E-commerce users repeatedly use e-commerce platforms that feature chatbots.
	Commit to using the chatbot	BI03	E-commerce users are committed to making chatbots part of their regular shopping experience to resolve issues.

This study used Structural Equation Modeling Partial Least Squares (SEM-PLS) with SmartPLS 4 to analyze the relationships between latent variables. SEM-PLS was chosen for its ability to handle complex models and test both the measurement and structural models simultaneously.

Before conducting the hypothesis testing, several tests were conducted to assess convergent validity, discriminant validity, and reliability, to ensure the quality of the measurement model. The validated model was then analyzed using bootstrapping to determine the significance of direct and mediation effects. This approach allows for evaluating how chatbot responsiveness, usability, and perceived risk influence customer satisfaction and behavioral intentions in e-commerce. Table 1 above presents the variables, indicators, and concept definitions used in this study.

4. RESULTS

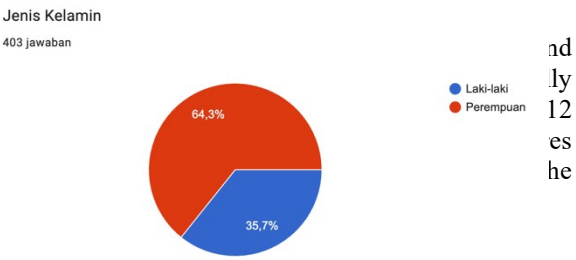
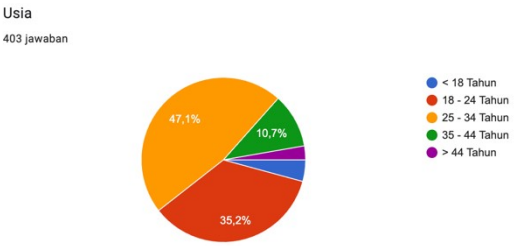


Figure 4: Respondents Gender

4.1 Respondents' Age

As shown in Fig. 2, respondents were relatively diverse in age. The majority were between 25–34 years old (47.1%), followed by those aged 18–24 years (35.2%), 35–44 years (10.7%), under 18 years (4.2%), and above 44 years (2.7%). This distribution indicates that most participants represent the young adult demographic, which aligns with the dominant age group of active e-commerce users in Indonesia.



accounted for 35.7%. This suggests that female users dominate e-commerce activities in Indonesia, reflecting broader trends in online shopping behavior.

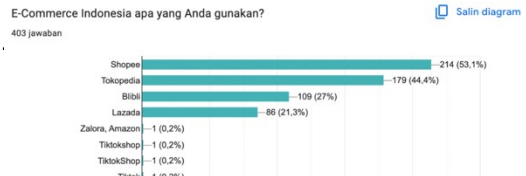


Figure 5: Average Daily E-Commerce Usage

4.4 Frequently Used E-Commerce Platforms

Figure 5 shows that Shopee was the most used platform at 53.1 percent. Tokopedia followed with 44.4 percent, then Blibli at 27 percent, and Lazada at 21.3 percent. These results confirm Shopee's leading position in Indonesia's e-commerce market, in line with recent industry reports.

Figure 6: Frequently Used E-Commerce Platforms

4.5 Analysis of reliability and validity

All constructs showed satisfactory internal consistency, as indicated by Cronbach's Alpha, rho_A, and Composite Reliability (CR) values that all exceeded the recommended threshold of 0.70 (Hair et al., 2017). This demonstrates that the measurement items used in this study are reliable and internally consistent. The highest CR value was found for Perceived Risk (0.949), followed by Usefulness (0.915), indicating that these two constructs are the most stable and dependable in capturing the intended concepts.

Table 2: Reliability and Validity Analysis

Variables	Cronbach 's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Responsiveness	0.802	0.807	0.883	0.716
Usefulness	0.861	0.863	0.915	0.783
Perceived Risk	0.919	0.919	0.949	0.860
Customer Satisfaction	0.754	0.760	0.859	0.670
Behaviour Intention	0.792	0.793	0.878	0.706

4.6 Convergent Validity

All Average Variance Extracted (AVE) values for convergent validity were above 0.50, which means each construct explains more than half of the variance in its indicators (Hair et al., 2017). Perceived Risk had the highest AVE (0.860), indicating that respondents provided consistent responses to questions about data privacy, transaction security, and potential loss. This suggests that the indicators for perceived risk closely match the construct.

4.7 Discriminant Validity

Discriminant validity was assessed using the Fornell-Larcker criterion. Table 3 shows that all diagonal values (√AVE) were higher than the correlations among constructs, which confirms adequate discriminant validity (Fornell & Larcker, 1981). The highest √AVE value was for Perceived Risk (0.928), indicating that its indicators, such as data privacy, transaction risk, and potential loss were the most distinct from other constructs. This result suggests that respondents could clearly distinguish perceived risk from other chatbot-related factors, such as responsiveness and usefulness.

Table 3: Discriminant Analysis

	BI	CS	PR	RS	US
BI	0.840				
CS	0.567	0.818			
PR	-0.496	-0.592	0.928		
RS	0.556	0.446	-0.349	0.846	
US	0.561	0.384	-0.290	0.394	0.885

4.8 Hypothesis testing

The hypothesis testing results confirmed that all ten proposed hypotheses were statistically supported at the 0.05 significance level (T > 1.96). Among them, Perceived Risk (PR) showed the strongest negative effect on Customer Satisfaction (CS) ($\beta = -0.468$, $T = 11.086$, $p < 0.001$), indicating that higher concerns about data security and transaction safety substantially reduce user satisfaction toward AI chatbots. The direct impact of PR on Behavioral Intention (BI) was also significant but weaker ($\beta = -0.181$, $T = 3.724$, $p < 0.001$), suggesting that although risk perception lowers user intention, some users still depend on chatbots for efficiency and immediacy.

In contrast, Usefulness (US) demonstrated the strongest positive effect on Behavioral Intention (β = 0.319, T = 7.408, p < 0.001), meaning that users' belief in chatbot usefulness significantly enhances their willingness to reuse or recommend the service. Responsiveness (RS) also had significant positive effects on both Customer Satisfaction (β = 0.219, T = 4.675, p < 0.001) and Behavioral Intention (β = 0.271, T = 5.944, p < 0.001), confirming that timely and relevant chatbot replies improve overall user experience.

Table 4: Hypotheses Testing

Path	O	M	STDEV	T-STAT	P values	Significance
RS → CS (H1)	0.219	0.220	0.047	4.675	0.000	Significant
US→ CS (H2)	0.161	0.161	0.048	3.360	0.001	Significant
PR → CS (H3)	-0.468	-0.467	0.042	11.086	0.000	Significant
CS → BI (H4)	0.217	0.216	0.055	3.945	0.000	Significant
RS → BI (H5)	0.271	0.271	0.046	5.944	0.000	Significant
US → BI (H6)	0.319	0.318	0.043	7.408	0.000	Significant
PR → BI (H7)	-0.181	-0.180	0.049	3.724	0.000	Significant
RS → CS → BI (H8)	0.048	0.048	0.016	2.968	0.003	Significant
US → CS → BI (H9)	0.035	0.035	0.015	2.334	0.020	Significant
PR → CS → BI (H10)	-0.101	-0.102	0.031	3.294	0.001	Significant

Mediation analysis showed that Customer Satisfaction partially explains all the relationships. The strongest effect was found in the path from Perceived Risk to Satisfaction to Behavioral Intention (β = −0.101, T = 3.294, p = 0.001), followed by Responsiveness to Satisfaction to Behavioral Intention (β = 0.048, T = 2.968, p = 0.003) and Usefulness to Satisfaction to Behavioral Intention (β = 0.035, T = 2.334, p = 0.020). These findings suggest that satisfaction increases the impact of chatbot usefulness and responsiveness on behavioral intention, while most of the negative effect of perceived risk on intention happens because it lowers satisfaction.

The structural model in Figure 6 shows strong links between the variables. Responsiveness (β = 0.266), Usefulness (β = 0.254), and Perceived Risk (β = −0.468) together explain 30.4% of the variance in Customer Satisfaction (R^2 = 0.304). Satisfaction, along with these three factors, explains 54.9% of Behavioral Intention (R^2 = 0.549). This means that chatbot responsiveness and usefulness boost both satisfaction and intention, while perceived risk lowers satisfaction and, as a result, also reduces intention.

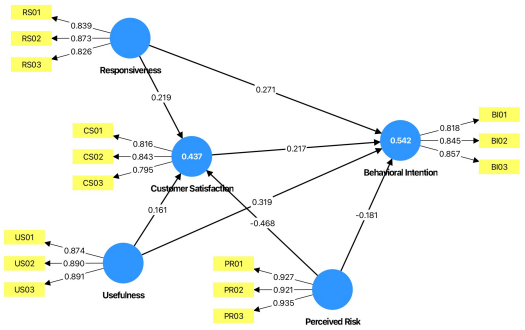


Figure 7: Partial Least Square (PLS) Model

4.9 Guerilla Interview Analysis

In addition to the PLS-SEM analysis, this study conducted brief guerilla interviews with users of Shopee, Tokopedia, Lazada, and Blibli to capture authentic experiences with AI chatbots. The qualitative findings revealed platform specific perceptions: Shopee's *Choki* was praised for quick and clear responses but criticized for overly templated answers; Tokopedia's *Tanya* was fast yet often repetitive and vague, especially in financial inquiries, raising security concerns; Lazada's *Lazzie* was seen as less relevant and generic, reducing user satisfaction; while Blibli's *BlibliCare* was valued for responsiveness and smooth escalation to human agents despite limitations in handling complex issues.

Overall, these insights reinforce the usefulness of the quantitative findings and show that responsiveness enhances satisfaction and behavioral intention, whereas perceived risk undermines trust and satisfaction. Customer satisfaction further acts as a partial mediator, amplifying the effects of chatbot service attributes on users' behavioral intention in e-commerce contexts.

5. RESULTS

5.1 Hypotheses Measurement Result

The results of the hypothesis testing showed that all proposed hypotheses were supported. This indicates that chatbot responsiveness, usability, and perceived risk significantly influence customer satisfaction and behavioral intention. This model explained 43.7% of the variance in Customer Satisfaction ($R^2 = 0.437$) and 54.2% of the variance in Behavioral Intention ($R^2 = 0.542$), indicating moderate to strong explanatory power.

Responsiveness showed a positive and significant effect on satisfaction ($\beta = 0.219$) and behavioral intention ($\beta = 0.271$). This means that users who rated chatbots as fast and responsive were more satisfied and more likely to continue using them. These findings align with previous research by Mahalli et al. (2025) and Siregar & Siregar (2025), which showed that fast responses increase user trust and perceptions of service quality in online interactions. Therefore, responsiveness remains an important determinant of satisfaction and the likelihood of reuse and recommendation behavior.

Usefulness also exhibits a positive and significant influence on both satisfaction $\beta = 0.161$ and behavioral intention $\beta = 0.319$. This supports the argument that the more users perceive chatbot interactions as informative, accurate, and helpful in solving their problems, the more satisfied they become and the more likely they are to reuse the chatbot. This finding reinforces previous research by Marjerison et al. (2025) and Hamsar et al. (2024), which found that perceived usefulness is a strong predictor of technology adoption and continued use in e-commerce contexts.

Perceived risk has the strongest negative impact in the model, especially on customer satisfaction ($\beta = -0.468$, $p < 0.001$, $f^2 = 0.331$). Concerns about data privacy, security, and the reliability of chatbot responses can greatly lower user satisfaction. While the direct effect of perceived risk on behavioral intention is weaker ($\beta = -0.181$, $p < 0.001$), its indirect effect through customer satisfaction is stronger ($\beta = -0.101$, $p = 0.001$). This means that perceived risk mainly influences behavioral intention by first reducing satisfaction. These findings are similar to those of Silva et al. (2023) and Zakaria et al. (2024), who found that perceived risk reduces user trust, satisfaction, and willingness to keep using digital services.

Customer satisfaction has a positive and significant effect on behavioral intention ($\beta = 0.271$, $p < 0.001$), supporting its role as a mediator in this model. This indicates that satisfied users are more likely to reuse the chatbot and recommend it to others. This finding aligns with theory and previous research by Li & Wang (2023) and Zhang & Wang (2025), which emphasizes that satisfaction is a key factor in post-adoption behavior in digital services.

The mediation analysis conducted showed that customer satisfaction partially mediated all relationships between the independent variables (responsiveness, usefulness, and perceived risk) and behavioral intention. The strongest mediation effect was found in the PR → CS → BI path ($\beta = -0.101$, $p = 0.001$), confirming that satisfaction is the primary channel through which perceived risk translates into behavioral outcomes. In contrast, the mediation effects for responsiveness and usefulness were smaller, indicating that these attributes influence behavioral intention both directly and indirectly.

5.2 Contribution and Implications

This study uses the Technology Acceptance Model (TAM) and SERVQUAL dimensions to explore how chatbot responsiveness, usability, and perceived risk affect customer satisfaction and behavior on four major e-commerce platforms in Indonesia: Shopee, Tokopedia, Lazada, and Blibli. The analysis found that both responsiveness and usability boost satisfaction and the intention to use chatbots, while perceived risk lowers satisfaction. Satisfaction also helps explain how trust and risk relate to chatbot adoption.

One thing that sets this study unique is the addition the usage of guerrilla interviews alongside survey data, providing direct feedback from real users on their experiences with chatbots. These interviews showed that usability and responsiveness encourage satisfaction and repeat use, but many users remain concerned about privacy and data security.

For managers, this study offers practical ways to improve chatbots on e-commerce platforms. Shopee's Choki could give more personalized and relevant answers by using better language processing and linking more closely to transaction and promotion systems. Tokopedia's Tanya could focus on clearer and more consistent answers to financial questions and improve data protection

with encryption and security alerts to reduce risk. Lazada's Lazzie could grow its knowledge base and use generative AI for more accurate and helpful responses. Blibli's BlibliCare could benefit from a hybrid approach that collects basic information before handing it to a human agent, making the process smoother and more efficient.

In addition to contributing to each e-commerce platform covered by this study, this study also expands existing chatbot research by integrating many variables according to the main problems found, namely responsiveness, usability, and risks perceived by e-commerce platform chatbot users into a predictive framework to provide deeper insights and to close the gap from previous research which has not tested comprehensively for these variables. Most previous studies only focus on the functionality of the chatbot alone without considering more deeply the responses obtained by users and also the security felt by the market when using the chatbot, this study provides a deeper contribution by providing clarification on how customer satisfaction variables can consider a possible risk perceived into behavioral intention variables and also provides the best suggestions that can be a direction for each e-commerce platform to further develop the best chatbot service system for users according to their needs by considering important factors perceived by users such as response, usability, and security.

5.3 Limitations and Future Research

This study has some limitations that suggest directions for future research. This study can provide recommendations for future research to highlight other industries, such as fintech, the medical industry, or digital travel services, rather than solely focusing on large e-commerce platforms. Furthermore, because this study examined chatbot usage only in live chat, future studies could investigate how chatbots perform across different channels, such as WhatsApp, Telegram, or social media. Adding variables such as trust, perceived ease of use, or user experience could also help to give the better understand how people use and adopt this technology.

6. CONCLUSIONS

This study provides a clearer picture of user needs when using AI-based chatbots on e-commerce platforms in Indonesia. This study combines the TAM and SERVQUAL frameworks and uses quantitative methods with survey data collection and qualitative methods with Guerilla interviews. The results indicate that AI-based chatbots that are perceived as helpful and capable of providing quick responses tend to increase user satisfaction and encourage repeat use of the e-commerce platform and chatbot services. Conversely, high perceived risk decreases satisfaction, ultimately affecting user intention to continue using the e-commerce service and chatbot features. The results of the Guerilla interviews support this analysis, stating that efficient, relevant, and well-executed interactions lead to greater user satisfaction and a return to the e-commerce platform and chatbot if they encounter any issues.

Based on the analysis of 403 respondents using AI chatbots in Indonesian e-commerce, the following conclusions can be drawn:

1. Usefulness (US) has been shown to have a significant positive effect on Customer Satisfaction (CS) and Behavioral Intention (BI). This indicates that chatbots that can provide answers tailored to user needs and respond to questions in a relevant and understandable manner contribute to user satisfaction by making it easier to obtain information on e-commerce platforms. This is a key driving factor influencing user satisfaction and behavioral intention.

2. Responsiveness (RS) has been shown to have a significant positive effect on Customer Satisfaction (CS) and Behavioral Intention (BI), indicating that chatbots that can provide fast responses are crucial in expediting the information search process and resolving user issues. The speed of a chatbot's response directly increases efficiency and satisfaction during interactions with the chatbot.

3. Perceived Risk (PR) was shown to have a significant negative effect on Customer Satisfaction (CS) and Behavioral Intention (BI). This confirms that security and trust remain major challenges in adopting AI chatbots in Indonesian e-commerce, thus requiring attention from other e-commerce companies implementing AI for their chatbot services.

4. Customer Satisfaction (CS) acts as a partial mediator, strengthening but not completely bridging the relationship between technology or service quality factors and behavioral intention. This study suggests that chatbots can help increase user satisfaction, especially when they are perceived as useful, responsive, and capable of providing appropriate answers.

5. Customer satisfaction was found to influence behavioral intentions, such as the intention to use

the e-commerce platform and the intention to rely on the chatbot if there are obstacles in using the platform.

For e-commerce platforms, these results emphasize the importance of designing chatbots that are not only responsive in real time but also helpful in resolving user issues and providing a sense of security. This research focuses on large platforms with a scope in Indonesia and live chat features, so that further research can further expand the scope to other sectors, explore several other communication channels used by users, add additional factors such as trust and overall user experience to further expand the scope of further research.

6.1. Open research issues

Although this study has identified the variables of responsiveness, usability, and perceived risk in shaping chatbot satisfaction and usage intentions, several research gaps remain. First, this study did not consider other variables such as trust, personalization, and perceived empathy, which can also influence user experiences more emotionally. Therefore, there is still room for further research to examine relational factors in chatbot interactions. Second, this study focused on four major e-commerce platforms, which further research could focus on other e-commerce platform or othes industries such as banking, healthcare, or public services to analyze how chatbots work in a broader context. Third, there are still many communication channels that can be explored besides chatbots in analyzing customer satisfaction factors in e-commerce, such as WhatsApp, email, and calls. Therefore, further research can expand the model by incorporating these factors to generate a more comprehensive understanding of AI chatbot adoption and user satisfaction.

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Data Availability: The dataset used in this study, which includes survey responses from users of major Indonesian e-commerce platforms (Shopee, Tokopedia, Blibli, and Lazada), has been deposited in an open-access repository to ensure transparency and reproducibility. The data can be accessed at the following link: https://doi.org/10.5281/zenodo.17667555
All personally identifiable information has been removed to protect participant privacy. Only anonymized and aggregated data relevant to the analysis of chatbot responsiveness, usefulness, perceived risk, customer satisfaction, and behavioural intention are included.

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