Mantik Journal, 9 (4) (2026), ISSN 2685-4236 (Online)

Published by:Institute of Computer Science (IOCS)

Jurnal Mantik

Journal homepage: www.iocscience.org/ejournal/index.php/mantik

The influence of chatbot interaction and chatbot problem solving on user satisfaction in Surabaya city mediated by accuracy on Shopee e-commerce in Indonesia

Christopher Wijaya[1], Mohamad Trio Febriyantoro[2]
[1,2]International Business Management Department, Faculty of Business Management, International Business Management – Regular Class, Universitas Ciputra, Indonesia

A R T I C L E I N F O

Article history:

Received Feb 12, 2026
Revised Feb 20 , 2026
Accepted Feb 28, 2026

Keywords:

Accuracy,
Chatbot Interaction,
Chatbot Problem Solving,
User satisfaction

ABSTRACT

This study examined the effect of chatbot interaction and chatbot problem-solving on user satisfaction in Shopee e-commerce in Surabaya, with accuracy as a mediating variable. The research applied a quantitative approach using questionnaire data collected from 235 Shopee users who had interacted with the Shopee chatbot. The data were examined using the Structural Equation Modeling–Partial Least Squares (SEM-PLS) approach. The results indicated that chatbot interaction and chatbot problem-solving had positive and significant effects on accuracy. Furthermore, both chatbot interaction and chatbot problem-solving directly influence customer satisfaction positively and significantly. Accuracy also had a significant positive effect on customer satisfaction. Mediation analysis showed that accuracy significantly mediated the relationship between chatbot interaction and customer satisfaction, as well as between chatbot problem-solving and customer satisfaction. These findings demonstrated that the quality of interaction and the effectiveness of chatbot problem-solving enhanced perceived accuracy, which subsequently increased user satisfaction. The study contributed to the understanding of AI-based customer service performance in the e-commerce context and highlighted the importance of improving chatbot accuracy to optimize user satisfaction. Practical implications suggest that Shopee should strengthen chatbot knowledge systems and response precision to ensure reliable and satisfying customer experiences.

Corresponding Author:

Christopher Wijaya,
International Business Management – Department, Faculty of Business Management, International Business Management – Regular Class
Universitas Ciputra,
UC Boulevard, Made, Sambikerep District, West Surabaya, East Java 60219
Email: Cwijaya10@student.ciputra.ac.id

1. INTRODUCTION

The industrial revolution can be defined as a shift in technological trends that has transformed the concept of production and service delivery since the beginning of the industrialization era. In 2025, Indonesia will still be in the Industry 4.0 phase, linked to creative innovation and marking a shift in business processes toward an era of economic

digitalization. This will undoubtedly impact the development of e-commerce in Indonesia. According to data from the Central Bureau of Statistics (Badan Pusat Statistik Indonesia, 2024.), the number of e-commerce users in Indonesia has increased since 2020, reaching 58.63 million users. In the second quarter of 2022, Tokopedia was the most widely accessed e-commerce platform by Indonesians, with 158.35 million users, followed by Shopee in second place, with 131.3 million. The penetration rate of e-commerce usage also increased from 2020 to 2023, reaching 21.56%. With e-commerce platforms like Tokopedia, Shopee, and others, people are increasingly provided with the convenience of purchasing goods without having to visit physical stores, and payments can be made digitally. According to data from the Indonesian Internet Service Providers Association (APJII, 2025), Shopee is the most widely accessed e-commerce platform in Indonesia, with 53.22% of respondents selecting Shopee as their preferred platform. This indicates that Shopee dominates the e-commerce market in Indonesia, competing closely with second-place TikTok Shop, with 23.37% of respondents choosing it, and third-place Tokopedia, with 9.57% choosing it. One factor contributing to Shopee's continued market dominance is its strong brand image and public trust.

However, as the number of e-commerce users in Indonesia increases, e-commerce companies like Shopee face the challenge of maintaining customer satisfaction. User satisfaction reflects the service provided by e-commerce companies to their users, aiming to meet customer expectations. User satisfaction will significantly impact e-commerce applications, such as customer loyalty to an e-commerce company. According to Shopee's internal data in 2023, Shopee received data showing a 17% increase in complaints from its app users related to chatbot services, even though more than 70% of interactions with Shopee users were conducted by Shopee chatbots (Izzudin et al., 2025).

If customers feel that a product or service is able to fulfill what they want well, then customer satisfaction is achieved (Santini et al., 2018). According to (Chung et al., 2020a), using virtual service agents seems to be similar to humans in providing benefits to humans who interact. explain that chatbots can mimic human behavior in the form of conversations like normal human speech and allow users to submit problems in the form of sentences in audio input format, and the chatbot will respond verbally or in writing (Shah et al., 2018). As a consequence, chatbots have now become an essential part of e-commerce, serving as a complement or even a substitute for front-line employees in carrying out shopping tasks (Ruan & Mezei, 2022). Driven by artificial intelligence (AI), chatbots have increasingly been adopted in customer service in recent years. They are computer-based systems designed to interact with users through natural language communication. (Shawar & Atwell, 2007).

According to (Chung et al., 2020a), the accuracy of a system depends on the various training data, both in terms of word choice and word combinations within a sentence. For a chatbot's responses to be accurate, it must be trained to use clear and specific words. This will ensure accuracy, as word frequency is a key measure of response accuracy. Accurate responses from chatbot interactions and problem-solving chatbots that resolve user issues will increase user satisfaction, which in turn will increase user loyalty.

This study focuses on users in Surabaya, analyzing how chatbot interaction quality and problem-solving capabilities impact Shopee user satisfaction. Shopee e-commerce is the right platform to test the mediating role of accuracy because it provides a chatbot system that is actively used by customers in various transaction processes, but still often raises complaints regarding the accuracy and relevance of the responses provided. The accuracy of chatbot responses in solving an e-commerce user's problem is crucial in determining whether users are satisfied or dissatisfied with the resolution of user problems. Research related to chatbot problem solving and interaction on Shopee user satisfaction in Surabaya is still limited, especially Accuracy as a mediating variable, and generally discusses its influence on shopping interest in an e-commerce.

Furthermore, the study will examine how accuracy will be a mediating factor in the relationship between the two, studying how the accuracy and relevance of the chatbot will impact users' perceptions and satisfaction with their experience.

One problem with chatbots is their poor performance due to poor analogy with human users, which indirectly influences negative user perceptions of the technology. Another problem with chatbots is that low levels of personalization result in services that are not tailored to user needs and problems, leading to user dissatisfaction, which negatively impacts consumer perceptions of e-commerce.

This study aims to address this research gap by explicitly analyzing the mediating role of accuracy in the relationship between chatbot interaction and problem-solving on user satisfaction. While several studies have highlighted the importance of chatbot accuracy and responsiveness on customer satisfaction, few studies have combined these three concepts into a single mediation framework, particularly in the context of a dynamic e-commerce market like Shopee in Surabaya. This research is expected to provide a deeper understanding of the complex mechanisms that ensure chatbot user satisfaction and offer practical applications for e-commerce developers and service providers to design more effective chatbot systems that focus on customer satisfaction. This research presents novelty by testing the chatbot performance model in the Surabaya MSME ecosystem, emphasizing the role of AI agents in a developing marketplace dominated by limited resources and diverse digital literacy. This study fills the theoretical gap by positioning accuracy as a cognitive mediating variable that explains the mechanism of influence of chatbot interaction and chatbot problem solving on user satisfaction, which has rarely been tested in an integrated model**.**

2. RESEARCH METHOD

This scientific article research used a questionnaire as its data collection method, employing a quantitative approach. The research location was Surabaya City, where online questionnaires were distributed via Google Forms to respondents residing in the city. During this period, data collection, questionnaire data processing, and testing and refinement of the research instrument were necessary to ensure the study met its objectives and was completed on time. The population of this study was residents of Surabaya City who had interacted with the Shopee e-commerce chatbot in Indonesia, thus providing respondents with experience interacting with chatbots, a requirement for this study. The data collection method used in this study was a questionnaire, with primary data obtained directly in the field from sources.

The sampling technique used was purposive sampling. Hair (2010) 10x indicators were used, with each section consisting of four questions, resulting in a minimum of 160 respondents. All responses to the online questionnaires were measured using a Likert scale with an internal scale of 1-4. In this study, respondents were residents of Surabaya City who had interacted with the Shopee e-commerce chatbot in Indonesia at least once. Validity and reliability tests are required to assess the validity and reliability of a questionnaire. The questionnaire instrument was tested using validity and reliability tests to ensure the indicators used were valid and reliable. This study used structural equation modeling with partial least squares (SEM PLS). The indicators used in this study were reflective indicators. The SEM PLS tool used to test validity and reliability was SMART PLS 3.

3. RESULTS AND DISCUSSIONS

The number of samples collected in this study was 235 respondents. The gender composition of the 235 respondents was 44.3% male and 55.7% female. This indicates that the majority of Shopee user respondents in this study were women. In this digital

age, women have high life needs including the need for beauty, clothing, bags, perfume, and others. In terms of frequency of Shopee use, 86% of respondents stated that they frequently use Shopee and only 14% said they do not use Shopee often. Respondents consisted of 3.4% students, 74% university students, 15.3% employees, 5.5% entrepreneurs or business owners, and 1.7% housewives. This shows that the number of respondents is dominated by Generation Z and at the same time this explains why in this digital age many necessities are purchased through e-commerce, especially by women. Of the 235 respondents, 71.1% of respondents have interacted with the Shopee Chatbot while the remaining 28.9% have never interacted with the Shopee Chatbot.

Table 1. Processed Data

Respondent Characteristics	Frequency	Percentage
Gender		
Male	104	44,3%
Female	131	55,7%
Employment Status		
Student	8	3,4%
College Student	174	74%
Employee	36	15,3%
Self-employed (Business Owner)	13	5,5%
Housewife	4	1,7%

Outer Model (Measurement Model)

According to (Ghozali & Latan, 2015), The outer model evaluation involves several tests. Convergent validity is assessed by examining the loading factor of each indicator on its intended construct, with an expected value greater than 0.6. Discriminant validity is evaluated using cross-loadings to determine whether a construct demonstrates sufficient discriminant capability; the loading on the intended construct should exceed its loadings on other constructs, with an expected threshold above 0.7 for each variable. Additionally, the Average Variance Extracted (AVE) is measured, with a recommended value greater than 0.5.

Partial Least Squares (PLS) research uses a Structural Equation Modeling (SEM) approach, which provides benefits for exploratory research and helps identify causal linkages rather than simply validating models. SmartPLS has the advantage of being able to process non-normal, evenly distributed data. It is also used in business learning and can mimic both formative and reflective talent variables (Hair et al., 2017).

Table 2. Processed Data

Item	Loadings	Composite Reliability	AVE
Chatbot Interaction		0,872	0,695
The chatbot has the knowledge to answer my questions	0,713		
Chatbot always answers my requests	0,889		
Chatbot pays attention to me	0,871		
The chatbot was consistently polite with me	0,885		
Chatbot Problem Solving		0,883	0,653
Chatbot happily handles returns and exchanges	0,838		
When I had a problem, the Chatbot showed genuine interest in solving it.	0,882		
Chatbot is able to handle my complaint directly and immediately	0,778		
Accuracy		0,907	0,710
Communication with Chatbot is completed on time	0,782		
Communication with Chatbot is accurate	0,762		
Communication with Chatbot is adequate	0,849		
Communication with Chatbot is reliable	0,837		
Customer Satisfaction		0,936	0,786
I am satisfied with the chatbot	0,902		
I am happy with the chatbot	0,871		

Chatbot does a good job	0,880
The chatbot does what I expected	0,892

All items above exhibit loading values that meet the significance criteria, i.e., above 0.7. The Average Variance Extracted (AVE) for all values is greater than 0.5, indicating that they meet the established convergent validity criteria when all values are above 0.5. These results enhance the reliability and consistency of the measurement model, affirming the convergent validity of the study's constructs.

Accuracy shows a composite reliability value of 0.907, indicating a high level of internal consistency and reliability in measuring the accuracy of the chatbot. CI shows a composite reliability value of 0.872, indicating that the CI indicators have good internal consistency and reliability in measuring the Chatbot Interaction variable. CPSA shows a composite reliability value of 0.883, indicating a fairly high level of problem-solving by the chatbot. S shows a composite reliability value of 0.936, indicating a high level of user satisfaction with the Shopee chatbot. This emphasizes the reliability of the instrument in measuring constructs related to the influence of customer satisfaction on the Shopee chatbot, as well as the underscore trustworthiness and internal coherence of the measurement model, reinforcing the reliability of the latent construct in this research.

Table 3. Processed Data

3.1 HTMT

	Accuracy	Chatbot interaction	Chatbot problem solving	Customer Satisfaction
Accuracy				
Chatbot interaction	0,783			
Chatbot problem solving	0,844	0,863		
Customer Satisfaction	0,896	0,853	0,849	

Based on the results of the discriminant validity test using the Heterotrait-Monotrait Ratio (HTMT), all HTMT values between constructs are below the threshold of 0.90. The HTMT value between Accuracy and Chatbot Interaction is 0.783, between Accuracy and Chatbot Problem Solving is 0.844, and between Accuracy and Customer Satisfaction is 0.896. Meanwhile, the HTMT value between Chatbot Interaction and Chatbot Problem Solving is recorded at 0.863, between Chatbot Interaction and Customer Satisfaction is 0.853, and between Chatbot Problem Solving and Customer Satisfaction is 0.849. All of these values meet the discriminant validity criteria because none exceed the threshold value of 0.90. Thus, each construct in the model can be stated to have clear differences from each other, and there are no multicollinearity problems between latent variables. These results indicate that respondents were able to distinguish each construct measured, thus the model can be declared valid based on discriminant validity. Although the HTMT value between Accuracy and Customer Satisfaction approached the 0.90 limit, this value was still within the maximum tolerance recommended (Henseler et al., 2014), thus discriminant validity was still met. The HTMT value approaching 0.90 indicates conceptual closeness between accuracy and satisfaction, but both remain cognitively and affectively different in service evaluation.

3.2 Inner Model (Structural Model)

The R-square test assesses the influence of a specific independent latent variable on the dependent latent variable. The R-square value is 0.50 for a model to be considered moderate, and 0.25 for a model to be weak (Ghozali & latan, 2015). A Q-square value greater than 0 indicates that the model demonstrates predictive relevance, whereas a Q-square value less than 0 suggests that the model lacks predictive capability. The objective of this inner model is to understand interrelations and ensure the overall structure of the

model remains cohesive and congruent. This test relies on the R-value and path coefficient estimates (Hair et al., 2017).

The R-square accuracy is 0.559, which is moderate and can be explained by chatbot interaction and problem-solving. This may be attributed to the accuracy of the chatbot in performing chatbot interaction and problem-solving. The R Square of Customer Satisfaction is 0.727, which is quite good because it is close to 0.75 and is explained by Accuracy, Chatbot Interaction, and Chatbot Problem Solving. Customer satisfaction can be seen from the level of Accuracy, Chatbot Interaction, and Chatbot Problem Solving performed by the Chatbot. Based on the results of the Q square calculation, the results show that the model has very good predictive ability on several endogenous variables. The Accuracy variable obtained a Q square value of 0.390, which indicates strong predictive relevance so that the influencing constructs can be predicted well by the model. The Chatbot Interaction and Chatbot Problem Solving variables obtained a Q square value of 0, which indicates that both variables are exogenous and cannot be predicted and show the weakness of the model. The Customer Satisfaction variable obtained a Q square value of 0.563, which indicates strong predictive relevance so that the influencing constructs can be predicted well by the model.

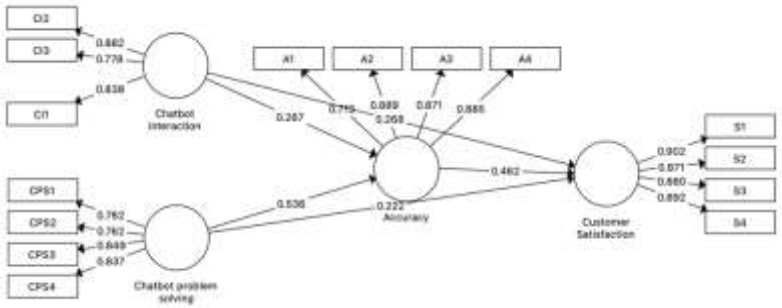

Figure 1. PLS Algorithm

The objective of this inner model is to understand interrelations and ensure the overall structure of the model remains cohesive and congruent. This test relies on the R value and path coefficient estimates (Hair et al., 2017).

3.3 Inner Model

The P Value is considered significant if the value is below 5% or 0.05 and if the T-Statistics value exceeds 1.96.

Table 4. Processed Data

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Significant
Accuracy -> Customer Satisfaction	0,462	0,461	0,057	8,054	0,000	Supported
Chatbot interaction -> Accuracy	0,267	0,266	0,076	3,503	0,001	Supported
Chatbot interaction -> Customer Satisfaction	0,392	0,391	0,068	5,740	0,000	Supported
Chatbot problem solving -> Accuracy	0,536	0,541	0,072	7,464	0,000	Supported
Chatbot problem solving -> Customer Satisfaction	0,470	0,471	0,069	6,769	0,000	Supported
Chatbot interaction -> Accuracy -> Customer Satisfaction	0,123	0,122	0,038	3,247	0,001	Supported
Chatbot problem solving -> Accuracy -> Customer	0,248	0,249	0,044	5,601	0,000	Supported

Satisfaction

Based on Table 4's inner model, the original sample data shows that the relationship between Accuracy and Customer Satisfaction is 0.462. The t-statistic is 8.504. The p-value is 0.000, indicating a significance level below 0.05. Therefore, there is a positive relationship between Accuracy and Customer Satisfaction. The original sample data shows that the relationship between Chatbot Interaction and Accuracy is 0.267. The t-statistic is 3.503. The p-value is 0.001, indicating a significance level below 0.05. Therefore, there is a positive relationship between Chatbot Interaction and Accuracy.

The original sample data shows that the relationship between Chatbot Interaction and Customer Satisfaction is 0.536. The t-statistic is 5.740. The p-value is 0.000, indicating a significance level below 0.05. So there is a positive relationship between Chatbot Interaction and Customer Satisfaction. The original sample data shows that the relationship between Chatbot Problem Solving and Customer Satisfaction is 0.536. T Statistics is 7.464. P Value 0.000 which means that it is significant below 0.05. So there is a positive relationship between Chatbot Interaction and Customer Satisfaction. The original sample data shows that the relationship between Chatbot Problem Solving and Customer Satisfaction is 0.470. T Statistics is 6.769. P Value 0.000 which means that it is significant below 0.05. So there is a positive relationship between Chatbot Problem Solving and Customer Satisfaction. The results of the mediation test indicate that Accuracy acts as a significant mediator variable in the relationship between Chatbot Interaction and Customer Satisfaction, as well as between Chatbot Problem Solving and Customer Satisfaction. The indirect effect of Chatbot Interaction on Customer Satisfaction through Accuracy has a coefficient value of 0.123 with a t-statistic of 3.247 and a p-value of 0.001 (<0.05), thus being declared significant. Meanwhile, the indirect effect of Chatbot Problem Solving on Customer Satisfaction through Accuracy shows a coefficient of 0.248 with a t-statistic of 5.601 and a p-value of 0.000 (<0.05), which is also significant. These findings indicate that the better the interaction and problem-solving capabilities of the chatbot, the higher the perceived level of accuracy, which ultimately increases customer satisfaction. Thus, Accuracy is proven to mediate the relationship between the two variables on Customer Satisfaction.

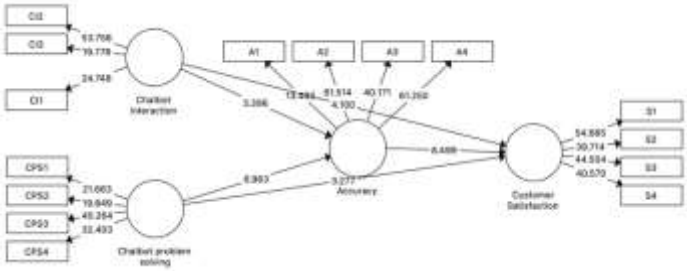

Figure 2. Inner Model

3.4 Discussion

The findings indicate that chatbot interaction has a positive and significant influence on the accuracy mediator. This suggests that the better the quality of interaction provided by the chatbot, the higher the user's perception of the accuracy of the information provided. Responsive, personalized, and communicative interactions naturally increase user confidence in the system's results (Følstad & Taylor, 2021); (Gajewska et al., 2020). Chatbots designed to understand the context of conversations and provide relevant, fast, and easy-to-understand responses are perceived as more accurate by users. Customer interactions with online platforms basically serve to attract and engage customers, thereby potentially increasing customer satisfaction (A. J. Kim &

Ko, 2012). Chatbot problem-solving capabilities also demonstrate a positive and significant impact on accuracy.

Therefore, further development in AI technology is essential to improve chatbot problem-solving capabilities in the future. For a chatbot to provide accurate, reliable, time-efficient, and socially beneficial answers, it needs to employ rich, expert, and intense communication, yet remain concise in its use of words and symbols. Therefore, an effective chatbot must be able to orient itself to user needs and adapt to them, thereby building strong relationships with customers (Chung et al., 2020). System accuracy largely depends on the nature of the training data and how word combinations are chosen (Hakim et al., 2020).

Accuracy has been shown to have a positive and significant impact on user satisfaction. Research findings reaffirm the crucial role of information accuracy in shaping positive user experiences. Satisfaction arises from a comparison between pre-consumption conditions and the actual outcome the customer obtains (Purwanto & Kuswandi, 2017). System quality and information quality significantly influence users' satisfaction with AI-powered service agents (Ashfaq et al., 2020)

Accuracy significantly mediates the relationship between chatbot interactions and user satisfaction. This suggests that good chatbot interactions will increase the perceived accuracy of information, and, in harmony, this accuracy will drive user satisfaction. Personalized and relevant interactions can improve overall customer satisfaction. Therefore, focusing on refining natural language processing (NLP) algorithms and chatbot knowledge bases is crucial to ensure interactions are not only smooth, but also informative and accurate. The emergence of first-generation chatbots in mobile messaging applications has played a significant role in shaping how humans interact with AI in the future, and has demonstrated a positive relationship between interactions with chatbots and user satisfaction levels (Zamora, 2017). In the context of Shopee, good interactions by chatbots are not always sufficient to generate customer satisfaction; if the interaction does not produce accurate answers, user satisfaction can decline. A study by Mulyanto and Budi (2024) shows that According to Mulyanto and Budi (Mulyanto et al., 2024), a high level of chatbot responsiveness characterized by the speed and accuracy in responding to customer requests significantly increases customer satisfaction, trust, and loyalty. (Mulyanto et al., 2024). Chatbots are one of the reasons why sales can occur, because chatbot users for online services will bring higher customer satisfaction with the brand (Ashfaq et al., 2020).

Accuracy has been shown to mediate the relationship between chatbot problem-solving ability and user satisfaction. In answering a problem, the chatbot not only provides a solution directly to the customer, but also conveys the reasons behind the solution, thus helping to minimize the potential for customer dissatisfaction (Wei et al., 2013). Accuracy in presenting information plays an important role in shaping how individuals assess and make judgments about that information (J. Kim et al., 2021)

The results of the study show that accuracy significantly mediates the relationship between chatbot interactions and customer satisfaction. This finding suggests that good chatbot interactions may not necessarily improve customer satisfaction if they are not accompanied by accurate information. In the context of Shopee, a friendly, fast, and communicative chatbot can increase customer satisfaction when the interaction produces accurate and relevant answers according to customer needs. AI-based customer service has a significant impact on customer satisfaction, while customer engagement in using chatbot services plays an important role in increasing the intention to reuse the chatbot (M. Kim & Chang, 2020). The link between efficiency and customer satisfaction in AI-powered customer service is clearly observable. Customer interactions with online platforms essentially serve to attract and engage customers, thereby potentially increasing their satisfaction (A. J. Kim & Ko, 2012).

When a chatbot is able to provide accurate solutions, users will perceive the problem-solving process as effective and ultimately feel satisfied. Customer satisfaction is influenced by how customers evaluate the system's effectiveness in resolving problems efficiently and providing appropriate support (Adamopoulou & Moussiades, 2024). Chatbots should be capable of understanding and accommodating a wide range of customer issues in order to ensure customer satisfaction (Lee & Choi, 2017). If users demonstrate a willingness to interact with the chatbot positively, this can influence user satisfaction (Balaji, n.d.). Customer interactions with virtual service agents on the internet are able to attract customer attention and embrace customers, therefore the interactions carried out will most likely be able to create customer satisfaction (A. J. Kim & Ko, 2012).

Accuracy has been shown to mediate the relationship between chatbot problem-solving ability and chatbot interaction. Precise responses generated through chatbot interactions and effective problem-solving capabilities that address user concerns will enhance user satisfaction, ultimately fostering greater user loyalty. Interactions between customers and online virtual service agents can capture users' interest and engage them effectively, increasing the likelihood of generating customer satisfaction (A. J. Kim & Ko, 2012). In addressing an issue, the chatbot not only delivers a direct solution to the customer but also explains the rationale behind it, thereby reducing the likelihood of customer dissatisfaction (Wei et al., 2013).

4. CONCLUSION

This study investigates the impact of chatbot interaction and problem-solving capabilities on Shopee e-commerce user satisfaction in Surabaya, with accuracy as a mediating variable. SEM-PLS analysis results consistently show that both chatbot interaction and problem-solving have a positive and significant effect on accuracy. Furthermore, accuracy plays a significant role as a mediator, significantly transferring the positive effects of chatbot interaction and problem-solving to user satisfaction. These findings confirm that the quality of interaction and the effectiveness of chatbot problem-solving are crucial predictors of perceived accuracy, which, in turn, is a key determinant of user satisfaction in the context of e-commerce transactions. This model contributes to the development of an AI service performance evaluation framework by integrating problem solving, interaction, accuracy, and satisfaction in a single multidimensional structural model.

Theoretically, this study adds to the literature on the application of AI-based customer service technology, particularly in the e-commerce context, by empirically validating the mediating role of accuracy. The developed model provides a more comprehensive framework for understanding the mechanisms behind the formation of user satisfaction with chatbot services, emphasizing the importance of the operational outcome Accuracy as a bridge between the functional attributes of Chatbot Interaction and Chatbot Problem-Solving, and customer satisfaction. Strategically, firms should prioritize algorithmic learning mechanisms that enhance diagnostic capability, response relevance, and solution accuracy rather than simply improving conversational fluency. Long-term loyalty in AI-based service contexts is more likely driven by consistent problem resolution performance than by anthropomorphic interaction features. Investment in knowledge-base refinement and real-time adaptive response systems is therefore critical. Despite its significant contribution, this study has several limitations. The study's concentration on Shopee users in Surabaya limits the extent to which the findings can be applied to the wider e-commerce population or to other geographic regions and demographic groups. Future research is recommended to expand the geographic scope. Exploring other mediating or moderating variables, such as perceived ease of use, trust, or problem complexity, could also provide additional insights into the dynamics of user satisfaction with chatbot services.

REFERENCES

Adamopoulou, E., & Moussiades, L. (2024). AI-powered marketing: What, where, and how? *International Journal of Information Management*, *77*, 102783. https://doi.org/10.1016/j.mlwa.2020.100006

Ashfaq, M., Yun, J., Yu, S., & Loureiro, S. M. C. (2020). I, Chatbot: Modeling the determinants of users' satisfaction and continuance intention of AI-powered service agents. *Telematics and Informatics*, *54*(3), 101473. https://doi.org/10.1016/j.tele.2020.101473

Asosiasi Penyelenggara Jasa Internet Indonesia - Survei. (n.d.). Retrieved February 19, 2026, from https://survei1.apjii.or.id/survei/register/48?type=free

Balaji, D. (n.d.). *Running head: ASSESSING USER SATISFACTION WITH INFORMATION CHATBOTS Assessing User Satisfaction with Information Chatbots: A Preliminary Investigation*.

Chung, M., Ko, E., Joung, H., & Kim, S. J. (2020). Chatbot e-service and customer satisfaction regarding luxury brands. *Journal of Business Research*, *117*, 587–595. https://doi.org/10.1016/J.JBUSRES.2018.10.004

Følstad, A., & Taylor, C. (2021). Investigating the user experience of customer service chatbot interaction: a framework for qualitative analysis of chatbot dialogues. *Quality and User Experience*, *6*(1). https://doi.org/10.1007/S41233-021-00046-5

Gajewska, T., Zimon, D., Kaczor, G., & Madzík, P. (2020). The impact of the level of customer satisfaction on the quality of e-commerce services. *International Journal of Productivity and Performance Management*, *69*(4), 666–684. https://doi.org/10.1108/IJPPM-01-2019-0018

Ghozali, I. L. H. (2015). *Partial Least Squares: Konsep, Teknik, dan Aplikasi Menggunakan Program SmartPLS 3.0 untuk Penelitian Empiris*. //opac.president.ac.id/index.php?p=show_detail&id=23882&keywords=

Hair, J. F., Tomas, G., Hult, M., Ringle, C. M., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM) Second Edition*. http://study.sagepub.com/

Hakim, L., Gustina, S., Putri, S. F., Faudiah, U., Studi, P., Informasi, T., & Proklamasi, U. (2020). Perancangan Chatbot di Universitas Proklamasi 45. *Edumatic: Jurnal Pendidikan Informatika*, *4*(1), 91–100. https://doi.org/10.29408/edumatic.v4i1.2157

Henseler, J., Ringle, C. M., & Sarstedt, M. (2014). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science 2014 43:1*, *43*(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Izzudin, A., S, C. Y. Y., Ramadhini, A. C., & Aulia, V. R. (2025). PENERIMAAN TEKNOLOGI CHATBOT SHOPEE OLEH KONSUMEN: STUDI KASUS PADA PLATFORM E-COMMERCE DI INDONESIA. *Kohesi: Jurnal Sains Dan Teknologi*, *8*(7), 141–150. https://doi.org/10.8734/Kohesi.v1i2

Kim, A. J., & Ko, E. (2012). Do social media marketing activities enhance customer equity? An empirical study of luxury fashion brand. *Journal of Business Research*, *65*(10), 1480–1486. https://doi.org/10.1016/J.JBUSRES.2011.10.014

Kim, J., Giroux, M., & Lee, J. C. (2021). When do you trust AI? The effect of number presentation detail on consumer trust and acceptance of AI recommendations. *Psychology and Marketing*, *38*(7), 1140–1155. https://doi.org/10.1002/mar.21498

Kim, M., & Chang, B. (2020). The Effect of Service Quality on the Reuse Intention of a Chatbot: Focusing on User Satisfaction, Reliability, and Immersion. *International Journal of Contents*, *16*(4), 1–15. https://doi.org/10.5392/IJoC.2020.16.4.001

Lee, S. Y., & Choi, J. (2017). Enhancing user experience with conversational agent for movie recommendation: Effects of self-disclosure and reciprocity. *International Journal of Human-Computer Studies*, *103*, 95–105. https://doi.org/10.1016/J.IJHCS.2017.02.005

Mulyanto, D., Pradiska Budi, A., & Surakarta, P. I. (2024). Chatbot Interactions and Customer Loyalty: Analyzing The Role of Personalization and Responsiveness. *Proceeding of International Conference on Science, Health, And Technology*, 164–174. https://doi.org/10.47701/ICOHETECH.V5I1.4170

Purwanto, & Kuswandi, K. (2017). Effects of Flexibility and Interactivity on the Perceived Value of and Satisfaction with E-Commerce (Evidence from Indonesia). *Market-Tržište*, *29*(2), 139–159. https://doi.org/10.22598/MT/2017.29.2.139

Ruan, Y., & Mezei, J. (2022). When do AI chatbots lead to higher customer satisfaction than human frontline employees in online shopping assistance? Considering product attribute type. *Journal of Retailing and Consumer Services*, *68*(2), 103059. https://doi.org/10.1016/j.jretconser.2022.103059

Santini, F. de O., Ladeira, W. J., & Sampaio, C. H. (2018). The role of satisfaction in fashion marketing: a meta-analysis. *Journal of Global Fashion Marketing*, *9*(4), 305–321. https://doi.org/10.1080/20932685.2018.1503556;JOURNAL:JOURNAL:RGFM20;REQUESTEDJOURNAL:JOURNAL:RGFM20;WGROUP:STRING:PUBLICATION

Shah, A., Jain, B., Agrawal, B., Jain, S., & Shim, S. (2018). Problem solving chatbot for data structures. *2018 IEEE 8th Annual Computing and Communication Workshop and Conference, CCWC 2018*, *2018-January*, 184–189. https://doi.org/10.1109/CCWC.2018.8301734

Shawar, B. A., & Atwell, E. (n.d.). *Chatbots: Are they Really Useful?*

Statistik E-Commerce 2024 - Badan Pusat Statistik Indonesia. (n.d.). Retrieved February 19, 2026, from https://www.bps.go.id/id/publication/2025/11/28/647323224ecc656c2933571b/statistik-e-commerce-2024.html

Wei, W., Miao, L., & Huang, Z. (2013). Customer engagement behaviors and hotel responses. *International Journal of Hospitality Management*, *33*(1), 316–330. https://doi.org/10.1016/j.ijhm.2012.10.002

Zamora, J. (2017). I'm Sorry, Dave, i'm afraid i can't do that: Chatbot perception and expectations. *HAI 2017 - Proceedings of the 5th International Conference on Human Agent Interaction*, 253–260. https://doi.org/10.1145/3125739.3125766