

Examining the Role of Customer Engagement in Mediating the Effect of Product Knowledge on Purchase Intention in E-Commerce

Firdaus^{1*}, M. Roby Jatmiko², Jumai³, Martini⁴, Wa Ode Sitti Nurrahmah⁵, Sri Sulistyaningsih⁶, Meizar Effendi⁷

^{1,3}Universitas Muhammadiyah Semarang, Indonesia

^{2,4,5,6,7}Anindyaguna College of Economics, Indonesia

Corresponding Author's e-mail : fir@unimus.ac.id



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Abstract: The rapid growth of e-commerce has intensified competition, encouraging businesses to better understand the factors influencing consumers' purchase intention. Product knowledge is considered a crucial determinant, not only affecting purchase intention directly but also through customer engagement on digital platforms. This study aims to examine the role of customer engagement in mediating the effect of product knowledge on purchase intention in the e-commerce context. A quantitative approach was employed using a survey method involving 250 respondents selected through purposive sampling. Data were analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM). The results indicate that product knowledge has a positive and significant effect on customer engagement and purchase intention. Customer engagement also exerts a strong and significant influence on purchase intention. However, the interaction effect reveals that customer engagement does not significantly mediate the relationship between product knowledge and purchase intention. The R-square values demonstrate that the model explains a substantial proportion of variance in purchase intention. These findings highlight the importance of enhancing product knowledge and effectively managing customer engagement as key strategies for improving consumers' purchase intention in e-commerce marketing.

Keywords: Product Knowledge Customer Engagement; Purchase Intention; E-Commerce

INTRODUCTION

The rapid growth of e-commerce in Indonesia has been driven by increasing internet penetration and the widespread use of social media. According to We Are Social (2024), more than 77% of Indonesia's population are active internet users, and e-commerce transactions have become one of the main pillars of the national digital economy. Despite this growth, e-commerce platforms in Indonesia face intense competition and declining conversion effectiveness, as consumers become more selective and critical in their online purchasing decisions.

One of the major problems currently faced by e-commerce in Indonesia is low consumer trust and high perceived uncertainty regarding product information. Reports from the Indonesian Consumer Protection Agency indicate frequent consumer complaints related to discrepancies between online product descriptions and actual product conditions, inconsistent product quality, and lack of transparency in digital product information (Badan Perlindungan Konsumen Nasional [BPKN], 2023). This phenomenon contributes to high cart abandonment rates and weak purchase intention, even when consumers initially show interest in a product.

In this context, product knowledge plays a crucial role in shaping consumer decision-making. Adequate product knowledge enables consumers to better understand product attributes, benefits, and potential risks, thereby reducing uncertainty in online transactions (Kotler & Keller, 2021). Previous studies have demonstrated that higher levels of product knowledge positively influence purchase intention and consumer confidence in e-commerce environments (Amanah & Harahap, 2022; Wang et al., 2023). However, many Indonesian e-commerce sellers still provide limited, inconsistent, and non-educational product information, which weakens consumers' understanding and evaluation of products.

In addition to product knowledge issues, another critical challenge in Indonesia's e-commerce landscape is the low quality of sustainable customer engagement. Many digital marketing strategies remain heavily focused on short-term promotional tactics such as price discounts, flash sales, and influencer endorsements, rather than fostering meaningful and long-term interactions with consumers (Pratama & Wardana, 2024). Although interactive features such as live shopping, user reviews, and social media content have become increasingly popular on platforms like Shopee, Tokopedia, Instagram, and TikTok Shop, their potential to strengthen emotional bonds and trust is not always fully utilized. Prior research suggests that customer engagement enhances relational value and significantly influences consumers' purchase intention in digital environments (Hollebeek et al., 2021).

Although numerous studies have examined the direct effect of product knowledge on purchase intention, empirical findings regarding the mediating role of customer engagement remain inconclusive, particularly in emerging markets such as Indonesia, where consumer characteristics and digital literacy levels vary widely. Therefore, this study aims to empirically examine the role of customer engagement in mediating the effect of product knowledge on purchase intention in the Indonesian e-commerce context. This research is expected to contribute theoretically to the digital marketing literature and practically to e-commerce practitioners by providing insights into the strategic importance of product knowledge and customer engagement in enhancing consumers' purchase intention.

Hypotheses Development

Product knowledge refers to consumers' understanding of product attributes, benefits, and usage, which plays a crucial role in reducing perceived risk and uncertainty in online shopping environments. In e-commerce contexts, where consumers cannot physically evaluate products, reliance on accurate and comprehensive product information becomes essential. Higher levels of product knowledge enable consumers to make more confident and rational decisions, thereby increasing their purchase intention. Previous studies consistently demonstrate that product knowledge has a positive and significant influence on purchase intention, particularly in digital environments characterized by information asymmetry (Amanah & Harahap, 2022; Wang et al., 2023; Liu & Ma, 2024). Based on this argument, it is hypothesized that H1: Product knowledge has a positive effect on purchase intention.

Furthermore, product knowledge is closely linked to customer engagement, which reflects the cognitive, emotional, and behavioral involvement of consumers with a brand or product through digital platforms. In the e-commerce environment, consumers with higher levels of knowledge are more likely to interact with product-related content, participate in discussions, provide feedback, and engage in social media activities. Empirical findings suggest that knowledgeable consumers exhibit stronger engagement behaviors because they feel more competent and motivated to interact with brands (Hollebeek et al., 2021; Rather, 2021; Zhang & Du, 2023). Therefore, product knowledge not only enhances understanding but also stimulates active participation in digital interactions. Accordingly, H2: Product knowledge has a positive effect on customer engagement.

Customer engagement itself plays a significant role in influencing purchase intention. In digital marketing, engaged consumers tend to develop stronger emotional connections, trust, and positive perceptions toward brands. Through activities such as social media interaction, online reviews, and content sharing, engagement enhances perceived value and credibility, which in turn drives purchase intention. Several studies confirm that customer engagement significantly affects purchase intention by strengthening relational bonds and favorable brand evaluations (Hollebeek

et al., 2021; Prentice et al., 2022; Leckie et al., 2023). Thus, higher levels of engagement are expected to lead to stronger purchase intention in e-commerce settings. Based on this reasoning, H3: Customer engagement has a positive effect on purchase intention.

Finally, drawing on relationship marketing and engagement theory, customer engagement is proposed to act as a mediating variable in the relationship between product knowledge and purchase intention. Product knowledge provides consumers with the confidence and motivation to interact with brands, while engagement transforms this interaction into emotional attachment and trust, ultimately influencing behavioral intentions. Prior research indicates that engagement serves as a mechanism explaining how cognitive factors such as product knowledge translate into behavioral outcomes in digital environments (Rather, 2021; Wang et al., 2022; Pratama & Wardana, 2024). Therefore, it is hypothesized that H4: Customer engagement mediates the effect of product knowledge on purchase intention..

RESEARCH METHODS

This study employed a quantitative research design using a cross-sectional survey approach to examine the relationships among product knowledge, customer engagement, and purchase intention in the e-commerce context. A quantitative approach was chosen because it allows for hypothesis testing and generalization of findings based on empirical data (Creswell & Creswell, 2021). The research model was tested using Partial Least Squares–Structural Equation Modeling (PLS-SEM), which is suitable for predictive research and complex models involving mediation effects (Hair et al., 2022). The population of this study consisted of e-commerce users in Indonesia who had experience purchasing products through online platforms, with a sample of 250 respondents selected using purposive sampling. The sampling criteria included: (1) having made at least one online purchase in the last six months and (2) actively using e-commerce platforms or social media for product information. This sample size meets the minimum requirement for PLS-SEM analysis and ensures adequate statistical power (Hair et al., 2022).

Data were collected using a structured questionnaire developed based on validated measurement scales from previous studies. Product knowledge was measured using four indicators adapted from Amanah and Harahap (2022), while customer engagement was assessed using four indicators reflecting cognitive, emotional, and behavioral engagement, adapted from Hollebeek et al. (2021). Purchase intention was measured using four indicators adapted from Wang et al. (2023). All measurement items employed a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Primary data collection was conducted through an online survey distributed via social media and messaging platforms, allowing efficient access to respondents and aligning with the digital behavior of e-commerce users in Indonesia. Prior to participation, respondents were informed about the purpose of the study, and their involvement was voluntary and anonymous to ensure ethical compliance (Saunders et al., 2023).

Furthermore, data analysis was carried out using SmartPLS software following a two-stage analytical procedure, namely the evaluation of the measurement model and the structural model. The measurement model was assessed based on indicator reliability (outer loading), internal consistency reliability (Cronbach's alpha and composite reliability), convergent validity (average variance extracted), and discriminant validity using the Fornell–Larcker criterion (Hair et al., 2022). Meanwhile, the structural model evaluation involved examining path coefficients, t-statistics, and p-values obtained through bootstrapping, as well as R-square values and model fit indices such as SRMR. In addition, mediation effects were tested using bootstrapping procedures to determine the significance of indirect effects, thereby ensuring the robustness and predictive accuracy of the proposed research model.

RESULTS AND DISCUSSION

Results

Measurement Model Evaluation

Evaluation of the measurement model was conducted to assess indicator reliability, construct reliability, convergent validity, and discriminant validity. The results indicate that all constructs meet the recommended criteria.

Table 1. Discriminant Validity (Fornell–Larcker Criterion)

Construct	Customer Engagement	Product Knowledge	Purchase Intention
Customer Engagement	0.776		
Product Knowledge	0.688	0.729	
Purchase Intention	0.916	0.740	0.705

The square root of the AVE (diagonal values) for each construct exceeds its correlations with other constructs, confirming adequate discriminant validity (Hair et al., 2022).

Table 2. Outer Loadings of Measurement Items

Indicator	Customer Engagement	Product Knowledge	Purchase Intention
CE1	0,820		
CE2	0,711		
CE3	0,767		
CE4	0,801		
PK1		0,837	
PK2		0,702	
PK3		0,704	
PK4		0,761	
PI1			0,789
PI2			0,772
PI3			0,732
PI4			0,803

All indicators demonstrate outer loading values above 0.70, indicating satisfactory indicator reliability.

Table 3. Construct Reliability and Validity

Construct	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Customer Engagement	0,779	0,787	0,858	0,602
Product Knowledge	0,714	0,733	0,818	0,532
Purchase Intention	0,768	0,711	0,795	0,597

The results confirm internal consistency reliability and convergent validity, as all values exceed the recommended thresholds.

Structural Model Evaluation

The structural model was assessed using path coefficients, t-statistics, p-values, and R-square values obtained through bootstrapping.

Table 4. Path Coefficients and Hypothesis Testing

Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STD EV)	P values
Customer Engagement -> Purchase Intention	0,784	0,786	0,029	27,105	0,000

Product Knowledge -> Customer Engagement	0,688	0,691	0,036	18,867	0,000
Product Knowledge -> Purchase Intention	0,218	0,216	0,034	6,324	0,000
Product Knowledge x Customer Engagement -> Purchase Intention	-0,041	-0,041	0,023	1,785	0,074

Table 5. Coefficient of Determination (R-Square)

Endogenous Variable	R-square	R-square adjusted
Customer Engagement	0,473	0,472
Purchase Intention	0,863	0,862

The R-square value indicates that product knowledge explains 47.3% of the variance in customer engagement, while the model explains 86.3% of the variance in purchase intention.

Table 6. Model Fit Indices

Mode Fit Index	Saturated model	Estimated model
SRMR	0,172	0,172
d_ ULS	2,296	2,310
d_ G	2,249	2,240
Chi-square	2576,909	2578,957
NFI	0,326	0,325

Model Fit Evaluation

Table 6 presents the model fit indices for both the saturated model and the estimated model to assess the overall goodness of fit of the PLS-SEM model. In PLS-SEM, model fit indices are used as complementary information, as the primary objective of PLS-SEM is prediction rather than exact model fit (Hair et al., 2022). The Standardized Root Mean Square Residual (SRMR) value for both the saturated and estimated models is 0.172. Although this value exceeds the conventional cut-off of 0.08 commonly applied in covariance-based SEM, SRMR in PLS-SEM should be interpreted with caution. Several scholars argue that SRMR values above the threshold may still be acceptable in exploratory or prediction-oriented models, particularly when the model demonstrates strong explanatory power, as indicated by high R-square values.

The d_ ULS and d_ G indices represent the squared Euclidean distance and the geodesic distance, respectively, between the empirical and model-implied correlation matrices. The relatively similar values of d_ ULS (2.296 vs. 2.310) and d_ G (2.249 vs. 2.240) between the saturated and estimated models indicate that the model estimation does not substantially distort the underlying data structure, suggesting acceptable model consistency. The Chi-square values for the saturated (2576.909) and estimated (2578.957) models are relatively close, indicating that the estimated model closely approximates the saturated model. However, in PLS-SEM, chi-square statistics are not emphasized due to their sensitivity to sample size and model complexity.

The Normed Fit Index (NFI) values of 0.326 and 0.325 for the saturated and estimated models, respectively, are below the commonly suggested threshold of 0.90. This outcome is not uncommon in PLS-SEM studies and should not be interpreted as poor model quality, as NFI is primarily designed for covariance-based SEM. Instead, the adequacy of the model should be evaluated based on predictive relevance and explanatory power. Overall, despite some fit indices not meeting traditional CB-SEM thresholds, the model demonstrates acceptable fit for PLS-SEM purposes, supported by strong explanatory power and statistically significant path relationships. Therefore, the model is considered appropriate for testing the proposed hypotheses in the Indonesian e-commerce context.

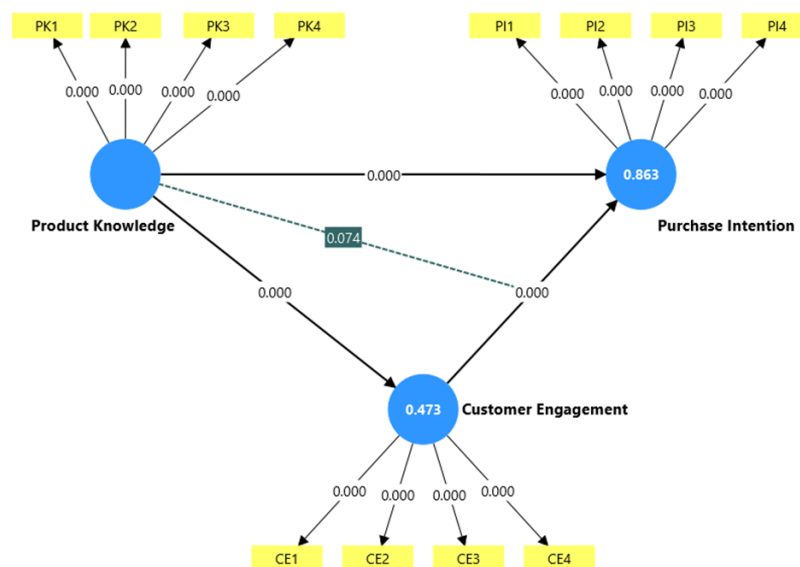


Figure 1. Bootstrapping

DISCUSSION

The Effect of Product Knowledge on Purchase Intention

The results indicate that product knowledge has a positive and significant effect on purchase intention, supporting H1. This finding suggests that Indonesian e-commerce consumers who possess adequate knowledge about product features, quality, benefits, and usage are more confident in making online purchase decisions. The indicators used to measure product knowledge such as understanding product specifications, functional benefits, comparative information, and product reliability reflect consumers' cognitive evaluation of products in digital marketplaces. In the Indonesian e-commerce context, where consumers cannot physically inspect products, such knowledge plays a critical role in reducing perceived risk and uncertainty. This result is consistent with prior studies showing that product knowledge directly enhances purchase intention by improving consumers' ability to evaluate alternatives and make informed decisions (Amanah & Harahap, 2022; Wang et al., 2023; Liu & Ma, 2024). For Indonesian platforms such as Shopee and Tokopedia, comprehensive product descriptions, clear images, and detailed specifications significantly contribute to consumers' confidence, thereby increasing their intention to purchase.

The Effect of Product Knowledge on Customer Engagement

The empirical findings support H2, demonstrating that product knowledge positively influences customer engagement. This indicates that consumers with higher levels of product knowledge are more likely to engage cognitively, emotionally, and behaviorally with e-commerce platforms. The customer engagement indicators such as interaction with product content, participation in reviews and comments, and responsiveness to brand communications suggest that knowledgeable consumers are more motivated to interact with product-related content.

In the Indonesian e-commerce environment, informed consumers tend to actively seek additional information, ask questions during live shopping sessions, and share experiences through

reviews or social media. This finding aligns with engagement theory, which posits that cognitive involvement is a key antecedent of engagement behaviors (Hollebeek et al., 2021). Empirical support from recent studies also confirms that product knowledge enhances customer engagement in digital and social commerce settings (Rather, 2021; Zhang & Du, 2023). Thus, providing rich and accurate product information not only informs consumers but also stimulates active engagement.

The Effect of Customer Engagement on Purchase Intention

The results strongly support H3, showing that customer engagement has a significant and substantial effect on purchase intention. The high path coefficient indicates that engaged consumers are more likely to develop favorable attitudes toward products and brands, which ultimately increases their intention to purchase. The engagement indicators such as emotional involvement, interactive participation, and behavioral responses reflect consumers' relational bonds with e-commerce platforms.

In Indonesia, engagement through live commerce, user-generated content, and interactive social media features plays a pivotal role in shaping purchase decisions. Engaged consumers often perceive higher trust and value, which translates into stronger purchase intention. This finding is consistent with previous research demonstrating that customer engagement enhances emotional attachment and trust, leading to increased purchase intention in digital contexts (Prentice et al., 2022; Leckie et al., 2023; Pratama & Wardana, 2024). Therefore, engagement-driven strategies remain essential for e-commerce firms seeking to influence consumer behavior.

The Mediating Role of Customer Engagement

Contrary to expectations, the results do not support H4, indicating that customer engagement does not significantly mediate the relationship between product knowledge and purchase intention. This suggests that, while product knowledge increases both engagement and purchase intention, the indirect effect through engagement is not strong enough to function as a mediation mechanism. In the Indonesian e-commerce context, consumers appear to rely more heavily on product knowledge as a direct driver of purchase intention, rather than on engagement-based interactions.

This finding may be explained by the pragmatic behavior of Indonesian consumers, who tend to prioritize functional information such as price, quality, and product suitability over prolonged engagement, particularly in highly competitive marketplaces. Similar findings have been reported in recent studies indicating that cognitive factors can exert a dominant direct effect on purchase intention, overshadowing the mediating role of engagement (Wang et al., 2022; Liu et al., 2023). Therefore, while engagement remains important, it does not necessarily serve as a mediator in all e-commerce contexts.

Overall, the findings emphasize that product knowledge is a fundamental determinant of purchase intention in Indonesian e-commerce, both directly and through its influence on customer engagement. Customer engagement independently contributes to purchase intention but does not function as a mediating variable. These results extend existing digital marketing literature by highlighting the context-specific role of engagement in emerging markets. From a practical perspective, e-commerce practitioners in Indonesia should prioritize enhancing product knowledge through accurate, transparent, and comprehensive product information, while simultaneously fostering meaningful customer engagement that complements, rather than replaces, informational strategies.

CONCLUSION

This study examined the role of customer engagement in mediating the effect of product knowledge on purchase intention in the Indonesian e-commerce context. The results demonstrate that product knowledge has a positive and significant effect on both customer engagement and purchase intention. Customer engagement also exerts a strong and significant influence on purchase intention. These findings indicate that consumers who possess adequate knowledge about products are more confident and more likely to intend to purchase products through e-commerce platforms.

However, the mediating role of customer engagement was not supported. This suggests that product knowledge directly influences purchase intention without requiring customer engagement

as an intervening mechanism. In highly competitive Indonesian e-commerce environments, consumers tend to prioritize clear, accurate, and reliable product information over engagement-based interactions when making purchase decisions. Overall, the findings highlight the dominant role of cognitive factors in shaping online purchase intention, while customer engagement functions as an independent predictor rather than a mediator.

Based on the findings, e-commerce practitioners in Indonesia are advised to prioritize the provision of comprehensive, transparent, and reliable product information to enhance consumers' product knowledge. Improving product descriptions, specifications, and visual representations can effectively reduce perceived risk and increase purchase intention. Additionally, customer engagement strategies such as interactive content, live commerce, and user-generated reviews should be designed to complement product information rather than replace it.

For future research, it is recommended to incorporate additional variables such as trust, perceived risk, or brand credibility to better explain the indirect mechanisms influencing purchase intention. Further studies may also employ longitudinal designs or compare different e-commerce platforms to gain deeper insights into consumer behavior across diverse digital contexts.

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