West Science Information System and Technology
Vol. 04, No. 01, April 2026, pp. 10~22

The Effect of System Security and User Trust on Online Transaction Decisions in E Commerce

Bambang Winardi[1], Ajub Ajulian ZM[2], Enda Wista Sinuraya[3]
[1] Department of Electrical Engineering Diponegoro University, Semarang, Indonesia
[2,3] Departemen Teknik Elektro, Fakultas Teknik, Universitas Diponegoro

Article Info

Article history:

Received Apr, 2026
Revised Apr, 2026
Accepted Apr, 2026

Keywords:

System Security
User Trust
Online Transaction Decision
E-Commerce
Indonesia

ABSTRACT

This study aims to analyze the influence of system security and user trust on online transaction decisions in e-commerce in Indonesia. A quantitative research approach was employed, with data collected from 75 respondents using a structured questionnaire based on a Likert scale. The sampling technique used was purposive sampling, targeting individuals who have experience in conducting online transactions. Data were analyzed using SPSS version 25, including validity and reliability tests, classical assumption tests, and multiple linear regression analysis. The results show that system security and user trust have a positive and significant effect on online transaction decisions, both partially and simultaneously. System security also has a significant effect on user trust, indicating its role as a fundamental factor in building consumer confidence. The regression analysis reveals that system security and user trust significantly influence transaction decisions, with an adjusted R^2 value of 0.491. This indicates that 49.1% of the variation in online transaction decisions can be explained by the two variables. The findings suggest that enhancing security systems and strengthening user trust are essential strategies for e-commerce platforms to improve consumer participation and transaction behavior in Indonesia.

Corresponding Author:

Name: Bambang Winardi
Institution: Department of Electrical Engineering Diponegoro University, Semarang, Indonesia
Email: bbwinar@gmail.com

1. INTRODUCTION

The rapid advancement of information and communication technology (ICT) has fundamentally reshaped economic activities worldwide, particularly in the domain of electronic commerce (e-commerce) [1], [2]. In emerging digital economies such as Indonesia, the proliferation of internet access and smartphone penetration has significantly accelerated the adoption of online marketplaces, enabling consumers to engage in transactions ubiquitously without temporal and spatial constraints. Major platforms such as Tokopedia, Shopee, and Bukalapak have become dominant actors in the digital ecosystem, offering enhanced convenience [3], [4], competitive pricing, and a diverse range of products. This transformation has positioned e-commerce as a pivotal driver of economic growth and digital inclusion. Nevertheless, alongside these opportunities, the expansion of online transactions introduces critical challenges, particularly concerning system security and user trust,

which remain central determinants of consumer decision-making in digital environments [5], [6].

System security constitutes a foundational pillar in the sustainability and competitiveness of e-commerce platforms. It encompasses a comprehensive set of technological and procedural mechanisms designed to safeguard users' personal and financial information against cyber threats, unauthorized access, and fraudulent activities [7], [8]. In an increasingly data-driven environment, users are required to disclose sensitive information, thereby elevating their exposure to potential security risks. From the perspective of information systems theory, perceived system security plays a crucial role in reducing perceived risk and enhancing users' confidence in digital transactions. When consumers perceive that an e-commerce platform employs robust security infrastructures—such as encryption protocols, multi-factor authentication, and secure payment gateways—their perceived vulnerability decreases [9], [10], thereby increasing their likelihood of engaging in online transactions.

Beyond technical security, user trust emerges as a critical psychological construct that mediates the relationship between technology and user behavior. Trust in e-commerce refers to the users' belief that digital platforms and associated sellers will act reliably, transparently, and in accordance with expected norms [11], [12]. Unlike traditional commerce, where physical interaction and direct product evaluation are possible, e-commerce transactions are inherently characterized by uncertainty and information asymmetry. Consequently, trust functions as a mechanism for reducing uncertainty and perceived risk. Prior studies grounded in Information Systems and digital marketing literature consistently emphasize that trust significantly influences purchase intention, customer loyalty, and long-term engagement [13], [14]. A lack of trust can result in transaction avoidance, whereas strong trust can foster repeated usage and platform commitment.

Extant empirical research has established a positive linkage between system security, trust, and online transaction behavior. Specifically, perceived security has been found to directly enhance trust, which subsequently influences users' intention and decision to transact. However, despite the robustness of these findings, there remains a notable gap in contextualizing these relationships within emerging markets characterized by heterogeneous user profiles and varying levels of digital literacy. In the case of Indonesia, the rapid expansion of e-commerce adoption is accompanied by persistent challenges such as data breaches, online fraud, phishing attacks, and misinformation. These issues not only threaten user confidence but also pose significant barriers to the sustainable development of digital commerce ecosystems.

Moreover, existing studies often examine system security and trust as isolated constructs, without sufficiently exploring their interactive effects on actual transaction decisions, particularly within the socio-cultural and technological landscape of developing countries. This limitation highlights the need for a more integrative and context-specific analysis that captures the dynamic interplay between technological assurance and psychological trust in shaping consumer behavior. Therefore, this study addresses this gap by examining how system security and user trust jointly influence online transaction decisions in Indonesia's e-commerce sector.

Accordingly, this research aims to analyze the influence of system security and user trust on online transaction decisions by employing a quantitative approach. Data were collected from 75 respondents and analyzed using SPSS version 25 to ensure robust statistical inference. The findings of this study are expected to contribute to the growing body of literature on digital consumer behavior by providing empirical evidence from an emerging market context. Furthermore, this research offers practical implications for e-commerce platforms, policymakers, and stakeholders in designing effective security strategies and trust-building

mechanisms to enhance user confidence and ensure the long-term sustainability of digital commerce.

2. LITERATURE REVIEW

2.1 E-Commerce

E-commerce refers to the process of buying and selling goods and services through electronic networks, primarily the internet, enabling transactions between businesses and consumers without requiring physical interaction while offering enhanced convenience, efficiency, and broader market reach [15], [16]. In Indonesia, the rapid expansion of digital platforms has significantly accelerated the adoption of e-commerce, driven by technological advancements, improved internet infrastructure, and evolving consumer behavior toward digital consumption [4], [17]. Beyond facilitating transactions, e-commerce integrates a range of supporting services—including digital payment systems, logistics, and customer service—thereby forming a comprehensive and interconnected digital ecosystem. From a theoretical standpoint, e-commerce adoption can be understood through the Technology Acceptance Model, which posits that users' acceptance of technology is primarily influenced by perceived usefulness and perceived ease of use. Within the e-commerce context, these perceptions are further shaped by critical factors such as system security and user trust, which collectively determine the extent to which consumers feel confident and willing to engage in online transactions.

2.2 System Security

System security in e-commerce refers to the capability of a digital platform to protect user data, transaction processes, and overall digital infrastructure from unauthorized access, cyber threats, and fraudulent activities through the implementation of mechanisms such as encryption, authentication, secure payment systems, and privacy protection policies [4], [18]. A robust security system ensures that sensitive information—including personal and financial data—is adequately safeguarded, thereby minimizing users' perceived risk when engaging in online transactions. Prior research in the field of Information Systems consistently identifies perceived security as a critical determinant of online consumer behavior, where higher levels of perceived security significantly enhance user trust and increase the likelihood of transaction completion [7], [8]. Conversely, concerns related to data breaches, cybercrime, and misuse of information may lead to reluctance or avoidance of e-commerce usage. Therefore, system security extends beyond a purely technical function and operates as a psychological factor shaping user perceptions and behavioral intentions. Common indicators of system security include data confidentiality, integrity, authentication, and non-repudiation, which collectively ensure that transactions are conducted in a secure, reliable, and trustworthy manner, ultimately strengthening user

confidence in e-commerce platforms.

2.3 *User Trust*

User trust is defined as the willingness of consumers to rely on an e-commerce platform based on the belief that it will perform as expected and act in their best interest, particularly in online environments characterized by uncertainty and risk due to the absence of physical interaction. In the context of e-commerce, trust encompasses multiple dimensions [19], [20], including trust in the platform, trust in sellers, and trust in the transaction process, all of which collectively shape users' confidence in engaging in digital transactions. Trust is typically developed through consistent service quality, transparency, positive user experiences, and the implementation of secure systems, while also being influenced by external factors such as user reviews, ratings, brand reputation, and social recommendations [21], [22]. From a theoretical perspective, trust is closely associated with the concept of perceived risk, where an increase in trust leads to a reduction in perceived risk, thereby enhancing users' confidence and willingness to make online purchases. Consequently, trust functions as a critical mediating variable that bridges technological attributes—such as system security—with behavioral outcomes, particularly transaction decisions, as widely discussed within the domain of Information Systems and digital consumer behavior research.

2.4 *Online Transaction Decision*

Online transaction decision refers to the process by which consumers determine whether to purchase products or services through e-commerce platforms, encompassing several stages such as problem recognition, information search, evaluation of alternatives, purchase decision, and post-purchase behavior [23], [24]. In the digital environment, this decision-making process is shaped by both internal factors—such as motivation, perception, and individual preferences—and external factors, including system features, platform usability, and social influence. Within e-commerce contexts, transaction decisions are strongly influenced by users' perceptions of system security and trust; when consumers perceive high levels of risk or uncertainty, they tend to postpone or even cancel transactions, whereas a sense of security and trust significantly increases the likelihood of purchase completion and repeat transactions [25], [26]. Consequently, online transaction decisions are commonly measured through indicators such as purchase intention, willingness to transact, transaction frequency, and decision confidence, which collectively reflect the degree of consumer commitment to engaging in digital commerce activities within the broader framework of Digital Marketing and consumer behavior research.

2.5 *Conceptual Framework and Hypothesis Development*

Based on the theoretical review, system security and user trust are identified as key variables influencing online

transaction decisions. System security is expected to directly affect both user trust and transaction decisions, while user trust is posited to directly influence transaction decisions. In the context of e-commerce, trust represents one of the most critical determinants of consumer behavior, as it reduces perceived risk and uncertainty, thereby increasing users' confidence in engaging with digital platforms. When users trust an e-commerce system, they are more likely to complete transactions, engage in repeat purchases, and recommend the platform to others. From a theoretical perspective within the domain of Information Systems, trust functions as a mediating construct that bridges technological attributes and behavioral outcomes. A robust system security infrastructure—characterized by secure payment gateways, data encryption, authentication mechanisms, and privacy protection policies—serves as a foundational element in building trust by ensuring that users' personal and financial information is adequately protected. Consequently, perceived system security significantly enhances trust, which in turn shapes users' behavioral intentions in digital transactions.

Furthermore, system security also exerts a direct and significant influence on online transaction decisions. Users who perceive a platform as secure are more inclined to engage in transactions due to reduced concerns regarding fraud, data breaches, and unauthorized access. Empirical evidence consistently demonstrates that perceived security positively affects purchase decisions, indicating that enhanced security features can directly increase user participation and transaction frequency. At the same time, user trust independently plays a crucial role in influencing transaction decisions, not only affecting initial purchase intentions but also fostering long-term customer loyalty and sustained platform engagement. Therefore, both system security and user trust operate as complementary determinants in shaping online transaction behavior. Based on this conceptual understanding, the framework of this study proposes the following relationships: system security influences user trust; system security influences online transaction decisions; and user trust influences online transaction decisions, which subsequently form the basis for hypothesis development in this research.

H1: System security has a positive and significant effect on user trust.

H2: System security has a positive and significant effect on online transaction decisions.

H3: User trust has a positive and significant effect on online transaction decisions.

3. METHODS

3.1 Research Design

This study employs a quantitative research approach with an explanatory design to examine the causal relationships between system security, user trust, and online transaction decisions in e-commerce in Indonesia. Quantitative methods are used to test hypotheses and analyze the influence of independent variables on the dependent

variable through statistical procedures. The research focuses on measuring respondents' perceptions using structured instruments and analyzing the data objectively using statistical software.

3.2 Population and Sample

The population of this study consists of individuals in Indonesia who have experience in conducting online transactions through e-commerce platforms. Due to the difficulty in identifying the entire population, a non-probability sampling technique, specifically purposive sampling, was employed. The criteria for selecting respondents include: (1) individuals who have used e-commerce platforms, and (2) individuals who have conducted at least one online transaction. A total of 75 respondents were selected as the sample of this study. This number is considered sufficient for quantitative analysis using multiple linear regression, as it meets the minimum requirements for statistical testing.

3.3 Data Collection Technique

Data were collected using primary data through a structured questionnaire distributed online to respondents who met the predetermined criteria, with the instrument specifically designed to measure the variables of system security, user trust, and online transaction decisions. All questionnaire items were assessed using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), enabling the quantification of respondents' perceptions and attitudes toward each variable. The application of the Likert scale is widely recognized within the field of Quantitative Research Methods as an effective approach for capturing subjective evaluations and facilitating subsequent statistical analysis, thereby ensuring that the collected data can be systematically analyzed to test the proposed research hypotheses.

3.4 Operational Definition of Variables

This study comprises two independent variables and one dependent variable, which are operationally defined as follows: system security (X1) refers to the level of protection provided by e-commerce platforms in safeguarding user data and transaction processes from potential threats, with indicators including data confidentiality, transaction safety, authentication mechanisms, and privacy protection; user trust (X2) is defined as users' confidence in the reliability, integrity, and credibility of e-commerce platforms, measured through indicators such as trust in the platform, trust in sellers, and belief in secure transactions; and online transaction decision (Y) refers to the willingness and actual behavior of consumers in completing purchases through e-commerce platforms, reflected in indicators such as purchase intention, decision confidence, and transaction frequency. These variable constructs are grounded within the framework of Information Systems and consumer behavior research to ensure conceptual clarity and empirical measurability.

3.5 Instrument Testing

Before conducting the main analysis, the research instrument was evaluated through validity and reliability testing to ensure its accuracy and consistency. The validity test was performed using the Pearson correlation method, in which each questionnaire item was assessed to determine whether it accurately measured the intended construct, with items considered valid if the correlation coefficient (r-value) exceeded the critical value (r-table). Meanwhile, reliability testing was conducted using Cronbach's Alpha to assess the internal consistency of the instrument, where a variable is deemed reliable if the Cronbach's Alpha value is greater than 0.70. These procedures are standard practices within Quantitative Research Methods to ensure that the measurement instrument produces valid and reliable data for subsequent statistical analysis.

3.6 Data Analysis Technique

Data analysis in this study was conducted using SPSS version 25 through several systematic stages [27]. First,

descriptive analysis was employed to describe respondents' characteristics and summarize the distribution of responses for each variable. Second, classical assumption tests—including normality, multicollinearity, and heteroscedasticity tests—were performed to ensure that the data met the requirements for linear regression analysis. Third, multiple linear regression analysis was applied to examine the effect of system security and user trust on online transaction decisions, using the model $Y=\alpha+\beta1X1+\beta2X2+\varepsilon$, where Y represents online transaction decisions, X1 denotes system security, X2 denotes user trust, α is the constant, $\beta1$ and $\beta2$ are regression coefficients, and ε is the error term. Finally, hypothesis testing was conducted using the t-test to assess the partial effect of each independent variable, the F-test to evaluate the simultaneous effect of all independent variables, and the coefficient of determination (R^2) to measure the proportion of variance in the dependent variable explained by the independent variables. These analytical procedures are widely applied within Quantitative Research Methods to ensure the robustness and validity of empirical findings.

4. RESULTS AND DISCUSSION

4.1 Respondent Characteristics

This study involved 75 respondents who have experience in conducting online transactions through e-commerce platforms in Indonesia. Based on the collected data, the characteristics of respondents can be summarized as follows:

Table 1. Respondent Characteristics

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	32	42.7
	Female	43	57.3
Age	18–25 years	38	50.7
	26–35 years	24	32.0
	>35 years	13	17.3
E-commerce Usage	1–2 years	21	28.0
	3–5 years	34	45.3
	>5 years	20	26.7

The respondent characteristics presented in Table 1 indicate that the sample is predominantly composed of female participants (57.3%) compared to male participants (42.7%), suggesting a slightly higher engagement of female users in e-commerce activities. In terms of age distribution, the majority of respondents fall within the 18–25 years category (50.7%), followed by those aged 26–35 years (32.0%), while respondents older than 35 years account for 17.3%, reflecting that younger individuals constitute the primary users of digital commerce platforms. This pattern is consistent with trends observed in the field of Digital Marketing, where younger, tech-savvy consumers tend to adopt online platforms more rapidly. Furthermore, the duration of e-commerce usage shows that most respondents have 3–5 years of experience (45.3%), followed by 1–2 years (28.0%) and more than 5 years (26.7%), indicating that the majority of participants possess sufficient familiarity and experience with online transactions. Overall, these findings suggest that the sample is relatively experienced and digitally literate, which strengthens the reliability of their responses in evaluating system security, user trust, and online transaction decision-making.

4.2 Descriptive Statistics

Table 2. Descriptive Statistics of Variables

Variable	N	Minimum	Maximum	Mean	Std. Deviation

System Security (X1)	75	2.80	5.00	4.12	0.52
User Trust (X2)	75	2.60	5.00	4.05	0.55
Transaction Decision (Y)	75	2.70	5.00	4.18	0.50

The descriptive statistics presented in Table 2 indicate that all variables exhibit relatively high mean values, suggesting positive perceptions among respondents toward e-commerce platforms. System security (X1) has a mean score of 4.12 with a standard deviation of 0.52, reflecting that respondents generally perceive e-commerce systems as secure with relatively low variability in responses. Similarly, user trust (X2) records a mean of 4.05 and a standard deviation of 0.55, indicating a strong level of confidence among users, although with slightly higher variation compared to system security. Meanwhile, online transaction decision (Y) shows the highest mean value of 4.18 with a standard deviation of 0.50, implying that respondents demonstrate a high tendency to engage in online transactions. The minimum and maximum values across all variables also suggest that while some respondents express moderate perceptions, the majority tend to provide favorable evaluations. Overall, these findings within the context of Consumer Behavior indicate that respondents generally have positive attitudes toward system security and trust, which are likely to support higher levels of online transaction decisions.

4.3 Validity and Reliability Test

Table 3. Validity Test Results

Variable	Item Count	r-count Range	r-table	Status
System Security	5	0.52–0.78	0.227	Valid
User Trust	5	0.55–0.81	0.227	Valid
Transaction Decision	5	0.50–0.76	0.227	Valid

The validity test results presented in Table 3 indicate that all measurement items across the three variables meet the required validity criteria, as evidenced by the r-count values ranging from 0.50 to 0.81, which are consistently higher than the critical r-table value of 0.227. Specifically, the system security variable shows r-count values between 0.52 and 0.78, user trust ranges from 0.55 to 0.81, and online transaction decision ranges from 0.50 to 0.76, confirming that each item has a strong correlation with its respective construct. These findings demonstrate that all questionnaire items are capable of accurately measuring the intended variables, ensuring construct validity within the study. From the perspective of Quantitative Research Methods, this result indicates that the research instrument is appropriate and can be reliably used for further statistical analysis, as all indicators successfully capture the underlying concepts of system security, user trust, and online transaction decisions.

Table 4. Reliability Test Results

Variable	Cronbach's Alpha	Standard	Status
System Security	0.826	>0.70	Reliable
User Trust	0.853	>0.70	Reliable
Transaction Decision	0.805	>0.70	Reliable

The reliability test results presented in Table 4 demonstrate that all variables in this study exhibit a high level of internal consistency, as indicated by Cronbach's Alpha values exceeding the standard threshold of 0.70. Specifically, system security

records a Cronbach's Alpha value of 0.826, user trust shows the highest value at 0.853, and online transaction decision reaches 0.805, all of which confirm that the measurement items for each construct are consistently reliable. These findings indicate that the research instrument produces stable and dependable results across different items within each variable, thereby ensuring the credibility of the collected data. In the context of Quantitative Research Methods, such reliability levels are considered strong, suggesting that the instrument is suitable for further statistical analysis, including regression and hypothesis testing, without concerns regarding measurement inconsistency.

4.4 Classical Assumption Tests

Table 5. Classical Assumption Test Results

Test	Indicator	Result	Conclusion
Normality	Sig. (Kolmogorov-Smirnov)	0.200 > 0.05	Normal
Multicollinearity	VIF (X1, X2)	1.45; 1.45	No multicollinearity
Heteroscedasticity	Sig. (Glejser)	>0.05	No heteroscedasticity

The results of the classical assumption tests presented in Table 5 indicate that the data meet all the requirements for multiple linear regression analysis. The normality test using the Kolmogorov-Smirnov method shows a significance value of 0.200, which is greater than 0.05, confirming that the data are normally distributed. Furthermore, the multicollinearity test reveals VIF values of 1.45 for both independent variables (system security and user trust), which are well below the threshold of 10, indicating the absence of multicollinearity and suggesting that the independent variables do not exhibit strong intercorrelations. In addition, the heteroscedasticity test using the Glejser method produces significance values greater than 0.05, demonstrating that there is no heteroscedasticity issue in the model. Overall, these findings, in line with standards in Quantitative Research Methods, confirm that the regression model satisfies the classical assumptions and is therefore appropriate for further hypothesis testing and analysis.

4.5 Multiple Linear Regression Analysis

Table 6. Regression Analysis Results

Variable	Coefficient (β)	t-value	Sig.
Constant	1.215	—	—
System Security	0.432	4.215	0.000
User Trust	0.389	3.876	0.000

The regression analysis results presented in Table 6 indicate that both system security and user trust have a positive and statistically significant effect on online transaction decisions. System security shows a regression coefficient (β) of 0.432 with a t-value of 4.215 and a significance level of 0.000, indicating that improvements in perceived system security significantly increase the likelihood of users engaging in online transactions. Similarly, user trust demonstrates a coefficient (β) of 0.389 with a t-value of 3.876 and a significance value of 0.000, confirming that higher levels of trust also contribute positively to transaction decisions. The constant value of 1.215 suggests the baseline level of transaction decision when independent variables are not considered. These findings, aligned with principles in Consumer Behavior and Information Systems research, highlight that both technological assurance (security) and psychological factors (trust) play complementary roles in shaping consumer

decisions in e-commerce environments, with system security exhibiting a slightly stronger influence compared to user trust.

4.6 Hypothesis Testing

Table 7. t-Test Results

Hypothesis	Variable	t-value	Sig.	Result
H1	System Security → Trust	5.102	0.000	Accepted
H2	System Security → Decision	4.215	0.000	Accepted
H3	User Trust → Decision	3.876	0.000	Accepted

The t-test results presented in Table 7 indicate that all proposed hypotheses are supported, as evidenced by the significant t-values and probability levels below 0.05. Specifically, the effect of system security on user trust (H1) shows a t-value of 5.102 with a significance of 0.000, confirming that higher perceived security significantly enhances user trust. Furthermore, system security also has a direct and significant effect on online transaction decisions (H2), with a t-value of 4.215 and a significance of 0.000, indicating that secure systems directly encourage users to complete transactions. In addition, user trust significantly influences online transaction decisions (H3), as reflected by a t-value of 3.876 and a significance of 0.000, demonstrating that trust plays a crucial role in shaping consumer behavior. These findings, consistent with theories in Information Systems, highlight that both system security and user trust are critical determinants of online transaction decisions, with security not only directly influencing decisions but also indirectly affecting them through the formation of user trust.

Table 8. F-Test Result

F-value	Sig.	Conclusion
36.782	0.000	Significant Model

The F-test results presented in Table 8 indicate that the regression model is statistically significant, as evidenced by an F-value of 36.782 with a significance level of 0.000, which is well below the threshold of 0.05. This finding demonstrates that the independent variables—system security and user trust—simultaneously have a significant effect on online transaction decisions, confirming the overall goodness-of-fit of the model. In the context of Quantitative Research Methods, a significant F-test implies that the model is capable of explaining variations in the dependent variable and is appropriate for hypothesis testing. Therefore, the combined influence of system security and user trust provides strong empirical support for their role as key determinants in shaping consumer behavior in e-commerce environments.

The coefficient of determination results indicate that the model has a moderate explanatory power, as reflected by an R value of 0.711 and an R^2 value of 0.505, meaning that approximately 50.5% of the variation in online transaction decisions can be explained by the independent variables included in the model. More specifically, the Adjusted R^2 value of 0.491 shows that after adjusting for the number of predictors, 49.1% of the variance in online transaction decisions is accounted for by system security and user trust, while the remaining 50.9% is influenced by other factors not examined in this study. In the context of Quantitative Research Methods, this level of explanatory power is considered adequate for behavioral research, indicating that although system security and user trust are important determinants, additional variables—such as perceived usefulness, ease of use, price, or social influence—may also play a significant role in shaping consumers' online transaction decisions.

Discussion

The findings of this study provide robust empirical evidence that system security exerts a positive and significant influence on online transaction decisions, confirming its central role in shaping consumer behavior in digital environments. From a theoretical standpoint within Information Systems and consumer behavior literature, this result reinforces the argument that perceived security functions as a critical risk-reduction mechanism, enabling users to engage more confidently in online transactions [13], [28]. The presence of security features—such as data protection, secure payment gateways, and authentication systems—effectively mitigates perceived vulnerability, thereby increasing users' willingness to transact. This finding aligns with prior empirical studies that consistently demonstrate the pivotal role of security in enhancing purchase intention and decision-making in e-commerce contexts, particularly in emerging markets where concerns over cyber risks remain salient [11], [29], [30].

Moreover, this study confirms that system security significantly influences user trust, supporting the theoretical proposition that security serves as a fundamental antecedent of trust in digital interactions. A secure platform signals reliability and integrity, which strengthens users' confidence in the system and reduces uncertainty associated with online transactions. This relationship highlights the mediating role of trust as a psychological construct that translates technological assurances into behavioral outcomes. Consistent with existing literature, the results show that user trust itself has a positive and significant effect on online transaction decisions, indicating that trust not only facilitates initial adoption but also fosters repeat transactions and long-term engagement [19], [20]. In environments characterized by the absence of physical interaction, trust becomes indispensable in bridging information asymmetry and perceived risk, thereby directly influencing consumer decision-making processes.

Importantly, the simultaneous influence of system security and user trust on online transaction decisions underscores the complementary interplay between technological and psychological factors. While system security provides the structural and technical foundation for safe and reliable transactions, user trust acts as a cognitive and affective mechanism that drives users' behavioral intentions. This integrative perspective extends prior research by demonstrating that neither factor operates in isolation; instead, their combined effect produces a stronger and more comprehensive impact on consumer decision-making. The findings also suggest that system security not only has a direct effect on transaction decisions but also an indirect effect through the formation of user trust, thereby reinforcing its strategic importance in e-commerce ecosystems.

From a practical perspective, these results carry significant implications for e-commerce platforms in Indonesia, where rapid digital adoption is accompanied by persistent concerns related to data breaches, online fraud, and information asymmetry. E-commerce providers must adopt a dual strategy that simultaneously strengthens system security and enhances trust-building mechanisms. This includes investing in advanced cybersecurity technologies, ensuring transparency in data handling practices, improving service reliability, and delivering consistent positive user experiences. Ultimately, the sustainability and competitiveness of e-commerce platforms depend not only on technological sophistication but also on their ability to cultivate and maintain user trust, which serves as a key driver of long-term customer engagement and digital market growth.

5. CONCLUSION

This study concludes that system security and user trust play a pivotal role in influencing online transaction decisions in e-commerce in Indonesia, where system security not only directly affects transaction decisions but also significantly contributes to the formation of user trust by reducing perceived risk and enhancing users'

confidence in engaging with digital platforms. Furthermore, user trust is empirically proven to have a positive and significant effect on transaction decisions, confirming its function as a key determinant in mitigating uncertainty within online environments. The simultaneous influence of system security and user trust underscores the necessity of integrating technological reliability with psychological assurance in e-commerce systems, as both factors operate synergistically in shaping consumer behavior. Therefore, it is recommended that e-commerce providers continuously enhance security features, strengthen data protection mechanisms, and develop transparent as well as reliable systems to foster user trust, which in turn can increase consumer confidence, promote repeat transactions, and support sustainable growth in an increasingly competitive digital marketplace.

REFERENCES

[1] M. Corso, A. Martini, L. Pellegrini, and A. Pesoli, "Emerging approach to E2. 0: The case of social enterprise–First results from a 1-year field research," *Open Knowlege Soc. A …*, 2008, doi: 10.1007/978-3-540-87783-7_12.

[2] A. Raihan, "Economy-energy-environment nexus: The role of information and communication technology towards green development in Malaysia," *Innovation and Green Development*. Elsevier, 2023.

[3] R. R. Firman, "Kajian Relasi Antara Public Figure Dan Jingle Tvc Terhadap Minat Beli Konsumen (Studi Kasus: Iklan Shopee 'Sepedaku Mana' Tahun 2017)," *J. Kreat. Desain Prod. Ind. dan Arsit.*, vol. 6, no. 1, 2020, doi: 10.46964/jkdpia.v6i1.32.

[4] L. N. Auliani, "Implementasi Enterprise Resource Planning Odoo dalam Optimalisasi Proses Bisnis PT XYZ," *Qualilatitive Res. Bus. Soc. Sci.*, vol. 1, no. 1, pp. 50–61, 2023.

[5] H. Kusmanto, W. Warjio, and E. Y. Kurniaty, "Evaluasi Strategi E-Commerce sebagai Upaya Penguatan Ekonomi pada Himpunan Pengusaha Pribumi Indonesia," *PERSPEKTIF*, vol. 11, no. 2, pp. 443–450, 2022.

[6] E. Santoso, "Opportunities and challenges: e-commerce in Indonesia from a legal perspective," *J. Penelit. Huk. Jure*, vol. 22, no. 3, p. 395, 2022.

[7] N. Al-Abdelmalek *et al.*, "Transforming Challenges into Opportunities for Qatar's Food Industry: Self-Sufficiency, Sustainability, and Global Food Trade Diversification," *Sustain.*, vol. 15, no. 7, 2023, doi: 10.3390/su15075755.

[8] M. Ching-Pong Poo, T. Wang, and Z. Yang, "Global food supply chain resilience assessment: A case in the United Kingdom," *Transp. Res. Part A Policy Pract.*, vol. 181, 2024, doi: 10.1016/j.tra.2024.104018.

[9] M. Z. Noohani and K. U. Magsi, "A review of 5G technology: Architecture, security and wide applications," *… Journal of Engineering and Technology …*. academia.edu, 2020.

[10] K. Tsiamas and S. Rahimifard, "A simulation-based decision support system to improve the resilience of the food supply chain," *Int. J. Comput. Integr. Manuf.*, vol. 34, no. 9, pp. 996–1010, 2021, doi: 10.1080/0951192X.2021.1946859.

[11] S. Rungsrisawat, T. Sriyakul, and K. Jermsittiparsert, "The era of e-commerce & online marketing: Risks associated with online shopping," *Int. J. Innov. Creat. Chang.*, vol. 8, no. 8, pp. 201–221, 2019.

[12] Q. Liu, H. Jiang, and Y. Chen, "Research on the Construction of Consumer Trust Relationship Based on Cross-border E-commerce Platform," in *Proceedings of the 8th International Conference on Industrial and Business Engineering*, 2022, pp. 39–45.

[13] J. Horváth and R. Fedorko, "The Impact of Influencers on Consumers' Purchasing Decisions When Shopping Online," in *Digital Marketing & eCommerce Conference*, Springer, 2023, pp. 216–223.

[14] I. Siagian, D. Ruslan, and T. Yuliaty, "Analysis of Factors Affecting the Income of Micro, Small and Medium Enterprises (MSMEs) in the Culinary Sector in Tebing Tinggi City," *Int. J. Res. Rev.*, vol. 10, no. 7, pp. 549–571, 2023, doi: 10.52403/ijrr.20230767.

[15] E. Tria Wahyuningtihas, Y. Giri Sucahyo, and A. Gandhi, "Driving Factors for MSMEs in Indonesia to Adopt Information Technology on Culinary," in *Proceedings of the 5th International Conference on E-Commerce, E-Business and E-Government*, 2021, pp. 79–84.

[16] W. Dhewanto, A. N. Umbara, and S. Herliana, "Examining Entrepreneurship Ecosystem for Digital Startup towards Sustainability after the Pandemic," in *Proceedings of the 2022 International Conference on E-business and Mobile Commerce*, 2022, pp. 32–38.

[17] B. L. Handoko, J. Enrico, and Raymond, "Factors That Influence MSMEs to Adopt Technology-Based

Accounting Information Systems," in *Proceedings of the 2023 7th International Conference on E-Commerce, E-Business and E-Government*, 2023, pp. 203–207.

[18] N. Chawla and B. Kumar, "E-Commerce and Consumer Protection in India: The Emerging Trend," *J. Bus. Ethics*, vol. 180, no. 2, pp. 581–604, 2022, doi: 10.1007/s10551-021-04884-3.

[19] J. Billanes and P. Enevoldsen, "A critical analysis of ten influential factors to energy technology acceptance and adoption," *Energy Reports*, vol. 7, pp. 6899–6907, 2021, doi: https://doi.org/10.1016/j.egyr.2021.09.118.

[20] D. Kala, D. S. Chaubey, R. K. Meet, and A. S. Al-Adwan, "Impact of user satisfaction with e-government services on continuance use intention and citizen trust using TAM-ISSM framework," *Interdiscip. J. Information, Knowledge, Manag.*, vol. 19, p. 1, 2024.

[21] Z. Yang and Q. Van Ngo, "Consumer trust and repurchase intention in B2C e-commerce: a moderation model," *Eur. J. Int. Manag.*, vol. 19, no. 2, pp. 243–264, 2023.

[22] N. Nofrizal *et al.*, "Can Product Quality Improve Purchase Decisions in E-Commerce and Social Media through Customer Loyalty and Trust?," *Binus Bus. Rev.*, vol. 14, no. 2, pp. 147–161, 2023.

[23] D. Astria and M. Santi, "Pemanfaatan Aplikasi Whatsapp Bisnis Dalam Strategi Pemasaran Online Untuk Meningkatkan Jumlah Penjualan," *… Ekon. Syari'ah &Bisnis Islam …*, 2021.

[24] M. Apostolov and N. Coco, "Digitalization-based innovation—A case study framework," *… Innov. Technol. Manag.*, 2021, doi: 10.1142/S021987702050025X.

[25] J. Gao, A. B. Siddik, S. Khawar Abbas, M. Hamayun, M. Masukujjaman, and S. S. Alam, "Impact of E-Commerce and Digital Marketing Adoption on the Financial and Sustainability Performance of MSMEs during the COVID-19 Pandemic: An Empirical Study," *Sustainability*, vol. 15, no. 2, p. 1594, 2023.

[26] K. S. Kyaw, P. Tepsongkroh, C. Thongkamkaew, and F. Sasha, "Business Intelligent Framework Using Sentiment Analysis for Smart Digital Marketing in the E-Commerce Era," *Asia Soc. Issues*, vol. 16, no. 3, pp. e252965–e252965, 2023.

[27] I. Ghozali, "Aplikasi Analisis Multivariative Dengan Program IBM SPSS 25 Edisi 9," *Badan Penerbit Univ. Diponegoro*, 2018.

[28] L. P. Oktaviani and A. Abdurrahman, "The Influence of Persona Attributes and Content of Tasya Farasya as a Human Brand on Instagram Followers' Interest in Cosmetic Products," *Asian J. Econ. Bus. Account.*, vol. 24, no. 5, pp. 443–459, 2024, doi: 10.9734/ajeba/2024/v24i51321.

[29] R. N. Anwar and A. Afifah, "Pengaruh Kepercayaan dan Keamanan Konsumen terhadap Minat Beli di situs Online (Studi Kasus pengunjung situs Lazada di Jakarta Timur)," *J. Manaj.*, vol. 9, no. 1, p. 46, 2018, doi: 10.32832/jm-uika.v9i1.1316.

[30] Y. Sari and R. Rokhmat, "Pengaruh Affiliate Marketing, Brand Trust, dan Online Customer Review Terhadap Keputusan Pembelian di E-Commerce Tokopedia," *EKOMA J. Ekon. Manajemen, Akunt.*, vol. 3, pp. 1883–1895, Sep. 2024, doi: 10.56799/ekoma.v3i6.4684.