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Analysis of Blockchain Adoption and Security Risk Factors in Digital Asset Transactions on the Indodax Platform Using the Unified Theory of Acceptance and Use of Technology

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Abstract

Background: Blockchain technology has emerged as a promising solution for enhancing transparency, decentralization, and security in digital asset transactions. Despite these advantages, the adoption of blockchain technology remains influenced by users' perceptions of its usefulness, ease of use, performance expectancy, social influence, and security risks.
Objective: This study aims to analyze the factors influencing users' behavioral intention to adopt blockchain technology on the Indodax digital asset trading platform by integrating the Unified Theory of Acceptance and Use of Technology (UTAUT) with the Perceived Security Risk construct.
Method: A quantitative research approach was employed using a structured questionnaire distributed to Indodax users who met the predefined respondent eligibility criteria. The collected data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to evaluate the measurement and structural models. Subsequently, a supplementary logistic regression sensitivity analysis was conducted using a categorized representation of behavioral intention, while PLS-SEM remained the primary inferential analytical method.
Result: The findings indicate that Perceived Usefulness, Perceived Ease of Use, Performance Expectancy, and Social Influence have significant positive effects on users' behavioral intention to adopt blockchain technology. Conversely, Perceived Security Risk has a significant negative effect, indicating that greater security concerns reduce users' willingness to engage in blockchain-based digital asset transactions.
Conclusion: These findings highlight the importance of improving system security, strengthening user trust, and enhancing platform usability to encourage blockchain adoption. This study contributes to the existing literature by integrating behavioral and security perspectives to evaluate blockchain adoption within Indonesia's digital asset ecosystem, particularly in the context of the Indodax platform.

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INTRODUCTION

The rapid advancement of information technology has accelerated the adoption of blockchain technology across various sectors, particularly in digital asset transactions. Blockchain provides a decentralized architecture that enhances transparency, immutability, and transaction security by eliminating the need for centralized intermediaries (Kukman & Gričar, 2025; Monrat et al., 2019; Theodorakopoulos et al., 2024). These characteristics have established blockchain as a fundamental technology underlying cryptocurrency trading, smart contracts, and decentralized

financial services, with applications spanning various domains, from education to public-sector governance (G. Chen et al., 2018).

As the digital asset market continues to expand, blockchain is increasingly recognized as a strategic technology capable of improving transaction efficiency while strengthening data integrity and user trust. Indonesia has experienced significant growth in digital asset adoption, supported by an increasing number of cryptocurrency investors and the availability of licensed trading platforms. Previous research has shown that consumer motivation to use cryptocurrency in Indonesia is driven by a combination of financial opportunities and technological curiosity (Muttaqin, 2023). One of Indonesia's largest cryptocurrency exchanges is Indodax, which facilitates digital asset transactions through blockchain-based systems.

Although blockchain offers several technical advantages, the successful implementation of this technology depends not only on its technical capabilities but also on users' willingness to adopt and continuously use blockchain-based services. Before adopting new technologies, users often evaluate perceived benefits, system usability, expected performance, social influence, and potential security risks. These considerations are particularly relevant given the documented risks associated with the centralized management of crypto assets on Indonesian digital exchanges (Muhammad Sulton Ibnu Aulia Adhan et al., 2026). The present study does not introduce uncited platform-level transaction volumes or incident counts beyond those documented in the cited sources. Consequently, its empirical claims are limited to the perceptions reported by the sampled Indodax users rather than being generalized to the entire Indonesian digital asset market.

Previous studies have demonstrated that technology adoption is influenced by multiple behavioral factors, including perceived usefulness, perceived ease of use, performance expectancy, and social influence. These factors have been widely examined through technology acceptance frameworks, including the Unified Theory of Acceptance and Use of Technology (UTAUT), as well as its applications to fintech and digital wallet adoption Abbas et al. (2025) and blockchain adoption in the real estate industry. However, blockchain adoption differs from the adoption of conventional information systems because it introduces additional concerns related to transaction security, cyber threats, digital asset protection, and trust in decentralized systems (Atzei et al., 2017). Consequently, perceived security risk has become an important determinant that should be considered alongside traditional technology acceptance constructs, with previous research confirming that perceived risk exerts a measurable influence on behavioral intention to adopt blockchain technology.

Despite the growing body of literature on blockchain adoption, several research gaps remain. Many previous studies have primarily focused on cryptocurrency investment behavior or general technology acceptance without comprehensively examining how behavioral factors and security risks jointly influence blockchain adoption on cryptocurrency exchange platforms, although integrated frameworks combining UTAUT with complementary models, such as the Technology-Organization-Environment (TOE) framework, have begun to emerge (K. S. T. Tan & Lee, 2025). Moreover, empirical evidence concerning blockchain adoption in the Indonesian digital asset ecosystem, particularly on the Indodax platform, remains limited.

This limitation highlights the need for further investigation to provide a more comprehensive understanding of user adoption behavior from both technological and security perspectives. More specifically, previous studies on blockchain adoption have commonly examined either technology acceptance determinants or security concerns, often outside the context of regulated Indonesian cryptocurrency exchanges. The present study contributes platform-specific empirical evidence from active Indodax users by examining whether conventional technology acceptance beliefs retain their explanatory relevance when transaction-related security risks are incorporated into the same research model. Its empirical contribution therefore lies in evaluating the direction and magnitude of these relationships within an Indonesian licensed digital asset exchange rather than merely combining previously established constructs.

Accordingly, the specific contribution of this study is not simply the integration of technology acceptance and security risk variables, which has precedents in related adoption research, but rather the simultaneous estimation of these relationships among verified Indodax

users and the explicit assessment of whether transaction-specific perceived security risk provides additional explanatory value beyond the potentially overlapping constructs of perceived usefulness and performance expectancy.

Indodax was selected as the empirical setting for this study because, as one of Indonesia's largest and longest-operating licensed cryptocurrency exchanges, it provides an informative platform-specific context for examining blockchain adoption dynamics among its users. Its selection also enables an in-depth examination of user behavior within a particular exchange, an approach that may provide insights that cross-platform studies cannot readily capture. To address the identified research gap, this study integrates selected constructs from the Unified Theory of Acceptance and Use of Technology (UTAUT) with the Perceived Security Risk construct to examine users' behavioral intention to adopt blockchain technology for digital asset transactions on the Indodax platform. A quantitative research approach was employed, with data collected through questionnaires administered to eligible respondents.

The proposed research model was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to assess the reliability and validity of the measurement model and the relationships among the research constructs. Furthermore, logistic regression was employed as a supplementary analysis to examine the influence of each independent variable on users' behavioral intention, thereby providing additional statistical evidence to complement the primary findings. The findings of this study are expected to contribute to both theory and practice. From a theoretical perspective, this research extends the existing technology adoption literature by integrating behavioral and security dimensions within the context of blockchain-based digital asset transactions, consistent with calls for adoption research that jointly considers behavioral and risk-related determinants.

From a practical perspective, the results provide insights for digital asset service providers, particularly Indodax, into opportunities to improve platform security, enhance user experience, strengthen public trust, and formulate strategies to encourage wider adoption of blockchain technology in Indonesia. PLS-SEM was employed as the primary inferential method because the research model comprises latent constructs measured through multiple indicators and requires the simultaneous assessment of measurement quality and structural relationships. Logistic regression was retained solely as a secondary sensitivity analysis using an observed categorical representation of Behavioral Intention. Accordingly, it does not replace the latent variable model or constitute an independent validation of construct validity.

Blockchain is a distributed ledger technology (DLT) that records transactions across a decentralized network, thereby supporting transparency, immutability, and data integrity (Monrat et al., 2019). These characteristics have established blockchain as a fundamental technology for digital asset transactions, enabling secure and efficient exchanges without relying exclusively on centralized authorities. On cryptocurrency trading platforms such as Indodax, blockchain supports transaction traceability, reduces the risk of data manipulation, and enhances user confidence in digital asset management.

These functions, in turn, depend on sound governance arrangements and robust financial transaction security architectures within blockchain-based systems. However, the successful implementation of blockchain depends not only on its technical capabilities but also on users' willingness to adopt the technology. Technology adoption is influenced by users' perceptions of the benefits, usability, and potential risks associated with a system. Therefore, understanding the behavioral factors underlying technology acceptance is essential for evaluating blockchain adoption on digital asset platforms.

The Unified Theory of Acceptance and Use of Technology (UTAUT) explains users' behavioral intentions to adopt and use technology through several behavioral determinants. In this study, four constructs were employed: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Performance Expectancy (PE), and Social Influence (SI). These constructs represent users' perceptions of the usefulness of blockchain technology, the ease of operating the platform, the expected improvements in performance, and the influence of individuals or communities in encouraging technology adoption, respectively. It is important to distinguish the theoretical origins of these constructs: PU and PEOU are traditionally associated with the Technology Acceptance Model (TAM), whereas PE and SI are established constructs in UTAUT. Thus, the

present research employs an integrated set of technology acceptance constructs rather than the original UTAUT framework in its entirety.

Considering that blockchain-based digital asset transactions involve financial value and cybersecurity concerns, this study extends the technology acceptance framework by incorporating Perceived Security Risk (PSR). This construct reflects users' concerns regarding transaction security, privacy, fraud, and potential cyber threats that may influence their intention to adopt blockchain technology. Such concerns are well documented in the technical literature on smart contract vulnerabilities and attack vectors targeting cryptocurrency exchanges (G. Chen et al., 2018). Conceptually, Perceived Usefulness refers to users' judgments that using Indodax improves the effectiveness or usefulness of their transaction activities, whereas Performance Expectancy captures their broader expectations that blockchain-enabled transactions will improve task or transaction performance. Perceived Security Risk is defined at the user level as the perceived exposure to financial loss, unauthorized access, privacy breaches, fraud, or transaction failure when using Indodax, rather than simply referring to the existence of technical vulnerabilities in blockchain technology.

Based on the proposed research model, five hypotheses were formulated to evaluate the effects of behavioral and security-related factors on users' behavioral intentions to adopt blockchain technology for digital asset transactions, as illustrated in Figure 1. Perceived Usefulness is hypothesized to have a positive effect on Behavioral Intention (H1), because users who perceive blockchain technology as beneficial are more likely to adopt it for digital asset transactions. Perceived Ease of Use is hypothesized to have a positive effect on Behavioral Intention (H2), because a system that is easier to understand and operate is expected to encourage users to adopt blockchain-based services.

Performance Expectancy is hypothesized to have a positive effect on Behavioral Intention (H3), because users are more likely to adopt blockchain technology when they believe it will improve transaction efficiency and performance. Social Influence is hypothesized to have a positive effect on Behavioral Intention (H4), because recommendations and support from peers, communities, and social environments are expected to strengthen users' intentions to adopt blockchain technology. Finally, Perceived Security Risk is hypothesized to have a negative effect on Behavioral Intention (H5), because higher perceived security risks, including concerns about fraud, cyberattacks, and privacy breaches, are expected to reduce users' willingness to adopt blockchain technology. A sixth, exploratory proposition (H6) identifies Behavioral Intention as an antecedent of actual Use Behavior concerning digital asset transactions on the Indodax application, consistent with the original UTAUT framework. However, this relationship was not empirically tested in the present cross-sectional study.

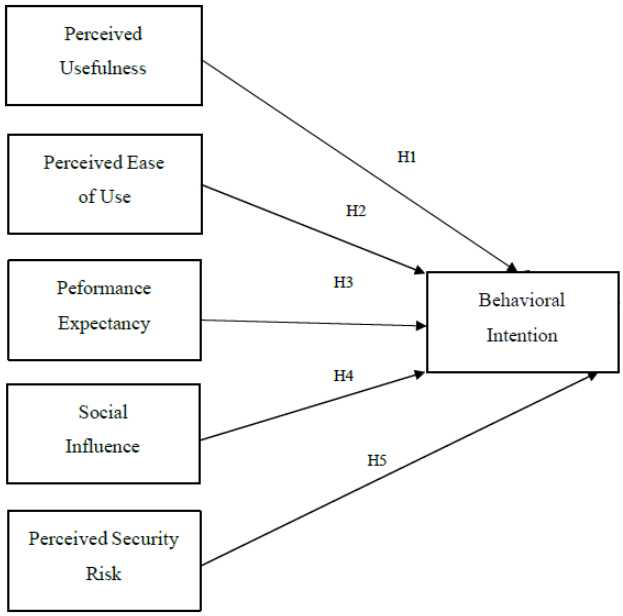


Figure 1. Hypothesis Model

METHOD

This study adopted a quantitative explanatory approach to examine the factors influencing users' behavioral intention to adopt blockchain technology for digital asset transactions on the Indodax platform. The proposed research model integrates the Unified Theory of Acceptance and Use of Technology (UTAUT) with the Perceived Security Risk (PSR) construct to evaluate how behavioral and security-related factors influence users' adoption intentions. This approach was selected because it enables the empirical testing of hypothesized statistical relationships among the proposed variables.

Although the cross-sectional research design does not establish causality, it provides statistical evidence for evaluating the formulated hypotheses. To strengthen the analytical findings, the study employed two complementary analytical techniques. Partial Least Squares Structural Equation Modeling (PLS-SEM) was used to validate the measurement model and assess the structural relationships among latent constructs, while logistic regression analysis was subsequently conducted to examine the direction and statistical significance of the predictors of users' behavioral intention to adopt blockchain technology. The combination of these methods provides a more comprehensive assessment of the proposed research model.

The study targeted 150 individuals who were familiar with digital asset transactions and had experience using the Indodax platform. Respondents were selected using purposive sampling, an approach well suited to studies requiring participants who meet predefined knowledge or experience criteria (Ting et al., 2025). This sampling technique was employed to ensure that the collected data reflected the experiences and perceptions of individuals who met the predefined research criteria. These criteria included having basic knowledge of blockchain technology and understanding the transaction mechanisms used by digital asset trading platforms. Primary data were collected through a structured online questionnaire distributed via Google Forms.

The questionnaire consisted of measurement items representing each research construct and was evaluated using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), as summarized in Table 1. A screening section at the beginning of the questionnaire was used to identify eligible respondents and establish their familiarity with the Indodax application, blockchain technology, and digital asset transactions. Eligibility was restricted to respondents who had personally used the Indodax platform for digital asset transactions rather than individuals who were merely familiar with the service.

This requirement was verified through screening questions administered before the main questionnaire. Accordingly, the final analytical sample consisted of 150 responses from eligible active users. Because the source manuscript does not document the exact fieldwork dates or a formal a priori statistical power analysis, these reporting limitations are explicitly acknowledged rather than inferred. The source manuscript also does not record the number of invitations distributed, response rate, pretesting procedures, common method bias diagnostics, or ethics approval number. These details are therefore not reconstructed retrospectively and are acknowledged as documentation limitations.

Table 1
Respondent Scoring Scale

Score	Description	Likert Scale
1	Strongly Disagree	1-5
2	Disagree	1-5
3	Neutral	1-5
4	Agree	1-5
5	Strongly Agree	1-5

The measurement instrument was developed by adapting validated indicators from previous studies on technology acceptance and blockchain adoption. The research model comprised six latent constructs: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Performance Expectancy (PE), Social Influence (SI), Perceived Security Risk (PSR), and Behavioral Intention (BI), as summarized in Table 2. Each construct was represented by multiple observable indicators designed to capture respondents' perceptions of blockchain adoption within the

Indodax platform. The complete wording of the measurement items and their respective adaptation sources should be retained in the study documentation or supplementary materials, as the present article provides only the construct-level descriptions available in Table 2.

Table 2
Research Variables

Construct	Description
Perceived Usefulness (PU)	The extent to which blockchain technology is perceived to improve the effectiveness and benefits of digital asset transactions.
Perceived Ease of Use (PEOU)	Users' perception regarding the ease of understanding and operating blockchain-based transaction services.
Performance Expectancy (PE)	Users' belief that blockchain technology enhances transaction performance and efficiency.
Social Influence (SI)	The influence of peers, communities, and social environments on users' intention to adopt blockchain technology.
Perceived Security Risk (PSR)	Users' perception of potential security threats, privacy concerns, and cyber risks associated with blockchain transactions.
Behavioral Intention (BI)	Users' intention to continue adopting blockchain technology in digital asset transactions.

The collected data were analyzed in two sequential stages. The first stage involved PLS-SEM using SmartPLS software to assess the validity and reliability of the measurement model before evaluating the proposed structural relationships. Convergent validity was assessed using outer loadings and the Average Variance Extracted (AVE), with outer loadings of 0.60–0.70 considered acceptable and AVE values above 0.50 indicating adequate convergent validity. Internal consistency reliability was evaluated using Cronbach's alpha and composite reliability, with values above 0.70 considered indicative of satisfactory reliability. The structural model was subsequently evaluated using bootstrapping in SmartPLS to estimate path coefficients, t-statistics, and p-values. A hypothesized relationship was considered statistically significant when the t-statistic exceeded 1.96 and the p-value was below 0.05. In the second stage, logistic regression analysis was performed to provide supplementary empirical evidence regarding the relationships between the independent variables and behavioral intention.

Unlike PLS-SEM, which evaluates relationships among latent variables, logistic regression estimates the probability of a binary outcome based on the observed predictor variables. The integration of these analytical techniques therefore provides complementary perspectives on blockchain adoption behavior.

Participation in this study was voluntary, and respondents provided informed consent before completing the online questionnaire. No personally identifiable information was collected, and all responses were analyzed and reported in aggregate form to protect respondents' confidentiality. For the supplementary logistic regression analysis, Behavioral Intention was operationalized as an observed binary outcome rather than retained as the original latent construct. Because the available study documentation does not provide a fully traceable, prespecified cutoff rule for this categorization, the logistic regression estimates are interpreted cautiously and used only as a supplementary assessment of coefficient direction. Accordingly, no claim is made that this categorization preserves all the information contained in the original Likert-scale measurements.

RESULTS AND DISCUSSION

Results

Respondent Profile

A total of 150 valid responses were included in the analysis following the data screening process. The respondents met the predefined sampling criteria, including familiarity with blockchain technology and experience conducting digital asset transactions through the Indodax platform. The respondent profile encompasses a diverse range of demographic characteristics,

including gender, age, educational background, occupation, and investment experience, providing an adequate basis for evaluating blockchain adoption intentions among digital asset users. Overall, the respondents' characteristics indicate that the collected data adequately represent active users with fundamental knowledge of blockchain technology and experience engaging in digital asset transactions. Accordingly, the dataset was considered suitable for subsequent statistical analyses using partial least squares structural equation modeling (PLS-SEM) and logistic regression.

Measurement Model Evaluation

The measurement model was evaluated to assess the reliability and validity of the research constructs before testing the proposed hypotheses. The evaluation covered six constructs: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Performance Expectancy (PE), Social Influence (SI), Perceived Security Risk (PSR), and Behavioral Intention (BI). Convergent validity was assessed using outer loading values and Average Variance Extracted (AVE), while construct reliability was evaluated using Cronbach's alpha (CA) and Composite Reliability (CR). The results are summarized in Table 3.

Table 3
PLS-SEM Measurement Model Evaluation Results

Variable	Indicator	Outer Loading	AVE	CA	CR
Perceived Usefulness (PU)	PU1	0.778	0.619	0.855	0.899
	PU2	0.820			
	PU3	0.750			
	PU4	0.788			
	PU5	0.794			
Perceived Ease of Use (PEOU)	PEOU1	0.845	0.438	0.845	0.853
	PEOU2	0.785			
	PEOU3	0.349			
	PEOU4	0.804			
	PEOU5	0.302			
Performance Expectancy (PE)	PE1	0.750	0.581	0.818	0.832
	PE2	0.637			
	PE3	0.798			
	PE4	0.780			
	PE5	0.831			
Social Influence (SI)	SI1	0.740	0.610	0.839	0.844
	SI2	0.810			
	SI3	0.831			
	SI4	0.749			
	SI5	0.771			
Perceived Security Risk (PSR)	PSR1	0.686	0.482	0.838	0.823
	PSR2	0.681			
	PSR3	0.698			
	PSR4	0.672			
	PSR5	0.732			
Behavioral Intention (BI)	BI1	0.815	0.660	0.871	0.872
	BI2	0.796			

BI3	0.784
BI4	0.826
BI5	0.840

The measurement model assessment, based on responses from 150 respondents, revealed that most research indicators had outer loading values approaching or exceeding the recommended threshold of 0.70, indicating satisfactory relationships with their respective latent constructs. However, several indicators fell below this threshold, particularly PEOU3 (0.349) and PEOU5 (0.302), which exhibited substantially weaker loadings. Consistent with these results, the AVE values for Perceived Ease of Use (0.438) and Perceived Security Risk (0.482) were below the recommended minimum threshold of 0.50, indicating insufficient convergent validity for these two constructs.

Although the overall instrument demonstrated acceptable measurement properties in several respects, these findings suggest that the measurement of PEOU and PSR requires further refinement. The Cronbach's alpha values ranged from 0.818 to 0.871, while the reported Composite Reliability values ranged from 0.823 to 0.899. These results generally indicate satisfactory internal consistency reliability, as all reported values exceeded the commonly recommended threshold of 0.70. Nevertheless, internal consistency reliability and convergent validity represent distinct measurement properties and must be evaluated separately. Acceptable Cronbach's alpha and Composite Reliability values do not compensate for weak indicator loadings or inadequate AVE. Accordingly, the low-loading PEOU indicators and the insufficient convergent validity of both PEOU and PSR constitute measurement limitations that should be considered when interpreting the substantive findings.

Structural Model Evaluation

Following the measurement model assessment, the structural model was evaluated to examine the hypothesized relationships among the research constructs. Hypothesis testing was conducted using the bootstrapping procedure in SmartPLS, with statistical significance assessed based on path coefficients, t-statistics, and p-values. The results are presented in Table 4 and illustrated in the SmartPLS structural model output in Figure 2.

Table 4
Hypothesis Testing Results

Hypothesis	Path Coefficient (β)	t-Statistic	p-Value	Decision
H1: PU → BI	0.358	4.267	0.000	Accepted
H2: PEOU → BI	0.281	3.114	0.002	Accepted
H3: PE → BI	0.336	3.982	0.000	Accepted
H4: SI → BI	0.194	2.301	0.021	Accepted
H5: PSR → BI	-0.243	2.756	0.006	Accepted

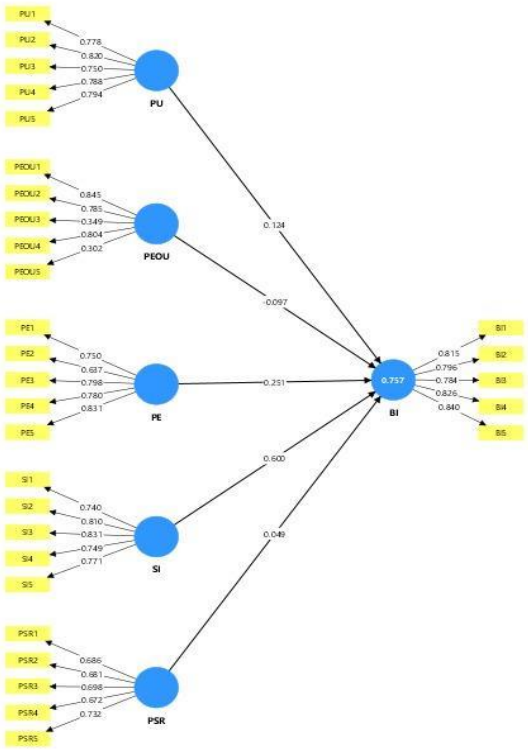


Figure 2. SmartPLS Structural Model Analysis Output

The results indicate that Perceived Usefulness has a positive and statistically significant effect on Behavioral Intention. The path coefficient of 0.358, t-statistic of 4.267, and p-value of less than .001 support H1, suggesting that the greater the perceived benefits of blockchain technology, the stronger users' intention to adopt blockchain-enabled services on the Indodax platform. Perceived Ease of Use also has a positive and statistically significant effect on Behavioral Intention, with a path coefficient of 0.281, t-statistic of 3.114, and p-value of .002. Therefore, H2 is supported, indicating that the perceived ease of understanding and using blockchain-related services is associated with stronger user adoption intentions. Similarly, Performance Expectancy demonstrates a positive and statistically significant effect on Behavioral Intention, with a path coefficient of 0.336, t-statistic of 3.982, and p-value of less than 001, supporting H3.

This finding suggests that users' expectations of improved transaction performance and security through blockchain technology are positively associated with their adoption intentions. Social Influence also has a positive and statistically significant effect on Behavioral Intention, with a path coefficient of 0.194, t-statistic of 2.301, and p-value of 021. Accordingly, H4 is supported, indicating that encouragement from the social environment, community interactions, and recommendations from other users contribute to users' intentions to adopt blockchain technology. Finally, Perceived Security Risk has a negative and statistically significant effect on Behavioral Intention, with a path coefficient of -0.243, t-statistic of 2.756, and p-value of .006, supporting H5.

This result indicates that higher perceived security risks are associated with lower intentions to use blockchain technology on the Indodax platform. The relationship between Behavioral Intention and Use Behavior (H6) was not empirically tested in this study. Although this relationship is included in the original Unified Theory of Acceptance and Use of Technology (UTAUT) framework, the present study focused on identifying the factors influencing Behavioral Intention as its primary dependent variable. Furthermore, because the study employed cross-sectional data capturing users' intentions at a single point in time, it could not directly establish whether those intentions translated into actual usage behavior. Consequently, H6 was not included in the empirical hypothesis testing, although the relationship remains relevant to the broader theoretical framework.

Logistic Regression Analysis

To complement the PLS-SEM findings, logistic regression analysis was conducted to examine the association between the predictor variables and users' Behavioral Intention. The results are summarized in Table 5.

Table 5
Logistic Regression Analysis Results

Variable	Coefficient (β)	Significance (p-value)	Influence
PU	+1.85	0.002	Significant Positive
PEOU	+1.42	0.010	Significant Positive
PE	+1.67	0.005	Significant Positive
SI	+0.98	0.045	Significant Positive
PSR	-1.21	0.018	Significant Negative

The logistic regression results reveal a pattern of coefficient directions consistent with those obtained from the structural model analysis. Perceived Usefulness, Perceived Ease of Use, Performance Expectancy, and Social Influence exhibit positive associations with Behavioral Intention, whereas Perceived Security Risk exhibits a negative association. These findings suggest that users' intentions to adopt blockchain technology on the Indodax platform are associated with their perceptions of its benefits, ease of use, expected performance, social influence, and security risks. Social interactions and engagement within digital asset communities also appear to play a meaningful role, while inadequate security-risk mitigation may discourage users from adopting blockchain-enabled services.

The consistency in coefficient directions across the two analytical approaches provides descriptive corroboration of the observed relationships. However, it should not be interpreted as independent evidence of model robustness or validity. PLS-SEM estimates relationships among latent constructs, whereas logistic regression examines the relationship between predictors and a categorical representation of the dependent variable. Dichotomizing Behavioral Intention also results in information loss. Therefore, the PLS-SEM findings remain the principal basis for substantive interpretation, while logistic regression serves as a supplementary sensitivity analysis.

Discussion

The empirical findings indicate that blockchain adoption intentions among users of the Indodax platform are associated with both technological and security-related factors. The statistically significant effects of Perceived Usefulness, Perceived Ease of Use, Performance Expectancy, and Social Influence suggest that users are more inclined to adopt blockchain-enabled services when they perceive clear benefits, ease of operation, improved transaction performance, and positive encouragement from their social environment. These findings are consistent with established technology adoption theories, which emphasize the importance of perceived value and user experience in shaping behavioral intentions (Jo, 2026).

They also correspond with Rohilla et al. (2026) findings in the distinct context of the real estate industry, which demonstrate that perceived usefulness and perceived ease of use remain relevant predictors of blockchain technology adoption across different sectors. The convergence of these otherwise distinct application domains around similar behavioral determinants provides additional contextual support for the core technology-acceptance relationships examined in the present study. Similarly, the significant role of Social Influence is consistent with Abbas et al. (2025) findings that peer and community behavior shape technology acceptance in fintech and digital-wallet contexts. This suggests that community dynamics surrounding cryptocurrency exchanges may operate similarly to those documented in other digital financial service environments.

In contrast, the negative effect of Perceived Security Risk highlights the continuing importance of security concerns as a potential barrier to blockchain adoption. This finding

corroborates evidence that perceived risk has a significant negative influence on blockchain adoption intentions (Malik et al., 2022). Although blockchain technology offers inherent characteristics such as decentralization and immutability, users may still perceive risks associated with cybersecurity threats, unauthorized access, fraud, and privacy breaches.

These concerns are not merely perceptual but are also grounded in documented technical vulnerabilities, including exploitable weaknesses in smart contract code T. Chen et al. (2020), coding flaws detectable through static analysis Tikhomirov et al. (2018), and vulnerabilities involving security bypasses at the cryptocurrency exchange level (Ji et al., 2020). These issues form part of the broader security and privacy challenges affecting blockchain systems (Conti et al., 2018). Such technical vulnerabilities help explain the statistically significant negative relationship between Perceived Security Risk and Behavioral Intention. The logistic regression coefficient of -1.21 further indicates a negative association of comparable numerical magnitude to several positive predictor coefficients. However, coefficient magnitudes across different variables should not be interpreted as directly comparable measures of relative influence without considering their scales and model specifications. These security concerns may undermine trust in digital asset platforms and discourage users from fully adopting blockchain-enabled services, particularly when the underlying exchange architecture relies on centralized custody and governance mechanisms rather than a fully decentralized peer-to-peer structure (Pandey & Kushwaha, 2025; T. M. Tan & Saraniemi, 2023).

Integrating behavioral factors with perceived security risk provides a more comprehensive perspective on blockchain adoption than approaches relying exclusively on conventional technology acceptance models. This integrated perspective is consistent with recent research frameworks that combine UTAUT with complementary organizational or risk-oriented models to capture the specific dynamics of blockchain adoption (K. S. T. Tan & Lee, 2025). The consistency of coefficient directions between PLS-SEM and the supplementary logistic regression analysis provides descriptive cross-checking only.

Because the two methods employ different representations of Behavioral Intention, this consistency should not be interpreted as independent model validation. From a practical perspective, the findings suggest that digital asset trading platforms should prioritize improvements in platform security, transparency, and user education while maintaining system usability and performance. These priorities are broadly consistent with governance and financial security recommendations documented in the wider blockchain systems literature (Kamal & Mita, 2023; Zachariadis et al., 2019). Such initiatives may strengthen user confidence, reduce perceived security risks, and ultimately encourage broader adoption of blockchain-enabled financial services in Indonesia.

Situated within the international discourse on blockchain adoption, these findings extend a research tradition encompassing diverse platforms, industry sectors, and blockchain architectures. This literature ranges from general examinations of blockchain applications, challenges, and opportunities Zheng et al. (2018) to sector-specific adoption studies, such as Al-haimi et al. (2025) investigation of the real estate industry, and emerging integrated frameworks, including K. S. T. Tan & Lee (2025) UTAUT-TOE model. It also encompasses extensive technical research documenting smart contract and exchange-level vulnerabilities across blockchain platforms, including alternative distributed ledger architectures beyond the account-based model examined in this study (Hearn & Brown, 2016; Wood, 2016).

Whereas much of the international literature examines blockchain adoption and blockchain security separately, the present study jointly investigates behavioral acceptance and perceived security risk within a single, high-volume Indonesian cryptocurrency exchange. This approach offers a potentially replicable empirical framework for other digital asset platforms in emerging markets seeking to identify the technological and security-related factors most strongly associated with local user adoption intentions. In doing so, the study contributes Indonesia-specific and Indodax-specific empirical evidence to the broader international discussion of the conditions under which blockchain-enabled financial services can establish and sustain user trust and adoption.

This study has several limitations that should be acknowledged. First, the research focused exclusively on users of a single cryptocurrency exchange platform, Indodax, and relied on

cross-sectional survey data collected at one point in time from a purposive sample of 150 respondents. Consequently, the findings may not fully represent blockchain adoption intentions across different digital asset platforms, user segments, or changing market conditions. Although purposive sampling was appropriate for reaching respondents with the required baseline knowledge and experience Ting et al. (2025), it does not support probabilistic generalization to the broader population of Indonesian digital asset users. Second, the AVE values for Perceived Ease of Use and Perceived Security Risk fell below the recommended threshold of 0.50.

The low AVE for Perceived Ease of Use was particularly associated with the weak outer loadings of two indicators, while the Perceived Security Risk construct also demonstrated insufficient convergent validity despite its acceptable reported internal consistency reliability. These findings indicate that the measurement instruments for both constructs require refinement, and the corresponding results should therefore be interpreted cautiously. Finally, because H6, which concerns the relationship between Behavioral Intention and Use Behavior, was not empirically tested, this study cannot establish whether the behavioral intentions measured in the survey translate into sustained actual use of blockchain-enabled digital asset transaction services over time.

The weak outer loadings observed for PEOU3 and PEOU5 also warrant substantive interpretation rather than being viewed solely as psychometric concerns. Because these indicators belong to the Perceived Ease of Use construct, their weak performance suggests that certain dimensions of platform usability captured by the original measurement instrument may not be consistently understood or experienced by Indodax users. These dimensions potentially include navigation complexity and the clarity of blockchain-specific terminology presented to end users.

Such differences may introduce measurement inconsistencies, particularly because respondents may have varying levels of familiarity with blockchain technology. Future refinement of the Perceived Ease of Use scale, supported by qualitative pretesting involving both novice and experienced digital asset users, could help identify the specific usability dimensions that are not being consistently captured. This process may strengthen the construct's convergent validity in subsequent applications of the research model. Perceived Security Risk requires similar consideration because its AVE value also falls below the recommended threshold. Acceptable reliability coefficients cannot compensate for inadequate convergent validity; therefore, both PEOU and PSR require further item-level refinement before strong construct-level conclusions can be drawn.

CONCLUSION

The PLS-SEM results provide the principal empirical evidence regarding the relationships between behavioral and security-related factors and users' blockchain adoption intentions. The findings suggest that technological advantages alone may be insufficient to encourage blockchain adoption without effective security measures and adequate user confidence. This study examined blockchain adoption intentions among Indodax users by integrating technology acceptance-related beliefs with perceived security risk. The principal PLS-SEM results indicate that Perceived Usefulness, Perceived Ease of Use, Performance Expectancy, and Social Influence have positive relationships with Behavioral Intention, whereas Perceived Security Risk has a negative relationship with Behavioral Intention. These findings provide platform-specific evidence that perceived functional value and social influence coexist with security concerns in shaping adoption intentions within an Indonesian digital asset exchange. The supplementary logistic regression analysis serves only as a sensitivity check because it relies on a categorical representation of Behavioral Intention and does not resolve the measurement limitations identified in the PLS-SEM assessment.

This study contributes to the literature by examining an integrated technology acceptance and security risk model within the Indodax context while identifying measurement limitations that warrant caution in interpreting the findings. Future research should refine the weak indicators, retain continuous or latent representations of Behavioral Intention, employ larger probability-based or multi-platform samples, and adopt longitudinal research designs to distinguish behavioral intentions from actual continued use. Comparative investigations across

regulated digital asset exchanges may further clarify whether the observed relationships are specific to individual platforms or reflect broader patterns of digital asset adoption.

Future research should therefore prioritize multi-platform and longitudinal research designs, refine the measurement of PEOU and PSR, and empirically examine whether Behavioral Intention translates into actual use across regulated digital asset exchanges.

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AUTHOR CONTRIBUTION STATEMENT

Aji Wahana: conceptualization, methodology, data collection, formal analysis, writing – original draft. Astari Retnowardhani: supervision, validation, writing – review and editing. Both authors read and approved the final manuscript.

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