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The Adoption of Blockchain Technology the Business Using Structural Equation Modelling

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Abstrak

Penelitian ini bertujuan untuk menyelidiki adopsi teknologi blockchain dalam konteks bisnis, mengakui blockchain sebagai inovasi penting yang mampu merevolusi metodologi operasional dan keamanan transaksi. Latar belakang penelitian ini mencakup evolusi dinamis teknologi dalam beberapa tahun terakhir dan semakin meningkatnya pengakuan terhadap potensi transformatif blockchain. Tantangan signifikan yang dihadapi dalam dunia bisnis adalah perlunya pemahaman komprehensif tentang faktor-faktor yang mempengaruhi adopsi teknologi blockchain di lingkungan bisnis. Terdapat 6 konstruk utama yang akan dipelajari yaitu Perceived Effectiveness (PU), Perceived Ease of Use (PEU), Security (SC), Trialability (TRI), dan Company Satisfaction (CS) terhadap Behavioral Intention to Use (BI). Penelitian ini menggunakan kerangka teortis yang komprehensif untuk membantu menganalisis faktor-faktor adopsi teknologi blockchain menggunakan Technology Acceptance Model (TAM). Metodologi penelitian mencakup pengumpulan data melalui survei yang dilakukan melalui Google Formulir online kepada 123 peserta, yang bertujuan untuk menunjukkan dengan tepat variabel-variabel penting yang mempengaruhi keputusan untuk mengadopsi blockchain. Dari responden hanya 86 peserta yang memenuhi kriteria ketat dan kemudian dianalisis menggunakan Structural Equation Modeling dengan software SmartPLS 4.0. Temuan penelitian ini secara menonjol menyoroti H7 yaitu SC dan PU sebagai hipotesis paling signifikan. Hasil penelitian ini menyoroti bahwa hubungan antara SC dan PU dalam penelitian ini kuat dan secara statistik sangat signifikan. Implikasi dari penelitian ini diharapkan dapat menumbuhkan pemahaman yang lebih luas dan inovatif mengenai teknologi blockchain dalam berbagai konteks bisnis.

Kata kunci*—Blockchain, Bisnis, SEM, TAM*

Abstract

This research aims to investigate the adoption of blockchain technology in a business context, recognizing blockchain as an essential innovation capable of revolutionizing operational methodologies and transaction security. The background of this study encompasses the dynamic evolution of technology in recent years and the growing recognition of blockchain's transformative potential. A significant challenge faced in the business world is the need for a comprehensive understanding of the factors that influence the adoption of blockchain technology in the business environment. The 6 primary constructs will be studied, namely Perceived Effectiveness (PU), Perceived Ease of Use (PEU), Security (SC), Trialability (TRI), and Company Satisfaction (CS) on Behavioral Intention to Use (BI). This research uses a comprehensive theoretical framework to help analyze blockchain technology adoption factors using the Technology Acceptance Model (TAM). The research methodology includes data collection through a survey conducted via online Google Forms to 123 participants, which aims to pinpoint

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essential variables that influence the decision to adopt blockchain. Of the respondents, only 86 participants met the strict criteria and were then analyzed using Structural Equation Modeling with SmartPLS 4.0 software. The findings of this study prominently highlight H7, namely SC and PU, as the most significant hypotheses. The results of this study highlight that the relationship between SC and PU in this study is solid and statistically very significant. The implications of this research will likely foster a broader and more innovative understanding of blockchain technology in various business contexts.

Keywords— *Blockchain, Business, SEM, TAM*

1. INTRODUCTION

Information technology's rapid growth has significantly impacted various sectors, including the business world. One of the leading innovations that has emerged is blockchain technology [1]. This technology, first introduced as the basis of the digital currency bitcoin, has evolved into a concept that could transform businesses' operations. Blockchain promises unmatched security, transparency and efficiency, motivating many organizations to adopt it [2]. However, this adoption process only sometimes runs smoothly, and several challenges arise along with implementation. In this digital era, where competition is increasingly fierce and technological change is occurring rapidly, a deep understanding of the factors influencing the adoption of blockchain technology can provide strategic advantages for companies [3]. Despite its positive potential, businesses' adoption of blockchain technology has yet to reach its peak. Some companies may still be hesitant or have difficulty implementing this technology effective. The research challenge is to determine the factors that influence the adoption of blockchain technology in business, and the interaction between these factors can be measured scientifically [4]. This issue requires an in-depth analysis of the variables that influence the adoption of blockchain technology, including technical, organizational, and environmental aspects [5]. By understanding these issues, we can provide valuable insights for organizations wishing to adopt blockchain technology and contribute to developing knowledge in this field [6]. The gap in this research lies in the lack of in-depth understanding of the factors that specifically influence the successful adoption of blockchain technology at the business level. Although the literature has covered this topic, previous research may not have broken it down into clearly measurable elements. Additionally, there is uncertainty regarding the impact of interactions between variables in the context of blockchain technology adoption. Previous research may not have fully explored the complexity of the relationships among adoption factors. In addition, there are limitations in applying theoretical frameworks such as the Technology Acceptance Model (TAM) in the business context of blockchain technology adoption. This research seeks to fill this gap by applying a theoretical framework that is more contextual and relevant to the business environment. In addition, the lack of emphasis on practical solutions for business in previous research is an important gap that we want to address. This research will focus on providing practical solutions and guidance for business organizations seeking to adopt blockchain technology. Lastly, uncertainty regarding the impact of blockchain technology on business performance is a significant gap, and this research will attempt to fill this gap by providing more comprehensive insight into the positive or negative impacts that may arise from the adoption of this technology. By exploring these gaps, this research is expected to make a meaningful contribution to the understanding and practice regarding the adoption of blockchain technology in business [7]. By applying Structural Equation Modeling (SEM), this research will measure the relationship between variables and identify the extent to which these factors contribute to adopting blockchain technology [8]. One of the main strengths of SEM is its ability to handle latent variables. Previous research has used SEM to measure abstract concepts such as 'attitude towards technology' or 'behavior intention', which are important determinants of technology adoption. Previous research has used SEM to test models in various population subgroups or to explore how relationships between variables may change based on moderator variables such as age, gender, or experience. This is very useful for understanding the dynamics of technology adoption in various contexts and populations. This approach is expected to provide a more profound and scientific understanding of the complexity of blockchain technology adoption factors in business. This research aims to identify influencing factors, analyze the relationship between variables, prove the contribution of these variables to adoption success, and provide practical guidance [9]. This research will significantly contribute to the scientific literature and provide valuable insights for organizations that want to optimize the benefits of blockchain technology in their operations. Through these steps, this research will provide a strong foundation for overcoming organizations' challenges in effectively adopting and implementing blockchain technology [10]. This article provides a list of all the elements specified in the literature review [11]. Previous studies have found that perceived benefits, such as increased efficiency, transparency, and security, are key motivators for blockchain adoption [12]. Organizations are likely to adopt blockchain when they see the technology's potential to cut costs, speed up processes, and reduce the risk of fraud [13]. Other studies also show that organizational readiness, including financial, technological, and human resources, is critical [14]. This study seeks to uncover the essential readiness factors that must be examined prior to adopting blockchain technology in the business sector and to provide pertinent tactical advice for doing so [15]. This research has significant urgency considering the rapid development of blockchain technology and its significant impact on various business sectors [16]. Blockchain technology offers innovative solutions to overcome the challenges of security, transparency and efficiency in business operations [17]. Therefore, a deeper understanding of the factors that influence the adoption of this technology at a business level is crucial to ensure that companies can exploit their potential optimally and compete in an increasingly global marketplace. This research contributes to scientific development and provides practical added value for companies seeking to optimize the application of blockchain technology in business operations.

2. METHODS

2.1 Proposed Model

This research will be a preliminary study to examine blockchain adoption in the business sector. The Technology Acceptance Model (TAM) provides a solid theoretical foundation for understanding and evaluating users' acceptance and adoption of technology, especially in using blockchain technology in the business sector. The main factors in TAM that have been shown in Figure 1, namely Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Behavioral Intention to Use (BI), along with external variables such as Security (SC), Trialability (TRI), and Company Satisfaction (CS) provide deep insight into how users may accept blockchain technology.

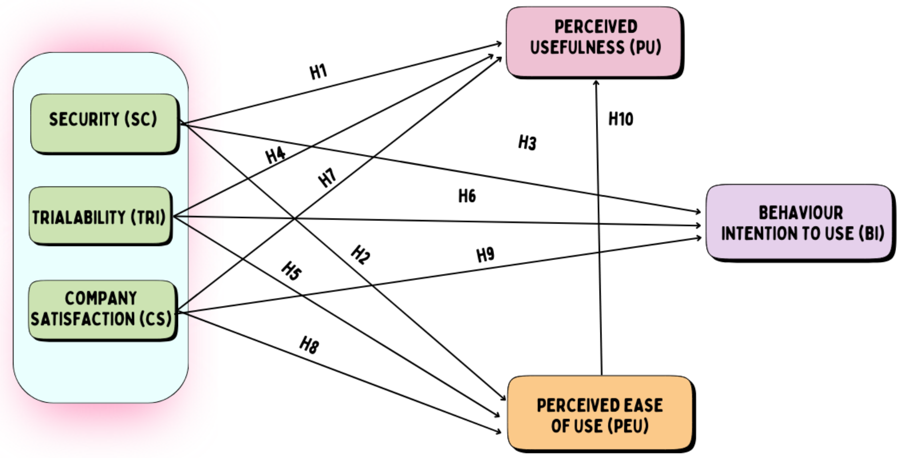

Figure 1 The Conceptual Model.

2.2 *Data Collection*

This research involved 123 respondents who were experts working in the corporate sector. The survey was conducted online, which can increase the affordability and efficiency of data collection. Experts in the corporate sector are invited to participate via a Google form shared online. The average survey completion time is approximately 5 minutes. This information shows a good level of engagement from respondents and gives the idea that the survey took little time, thereby increasing the response rate.

Table 1 Profil Respondents

Profile	Description	Frequency	Percentage
Gender	Male	47	54.65%
	Female	39	45.35%
Age	20–28	42	48.84%
	29-34	30	34.88%
	35-43	14	16.28%
Experience	≤1years	24	27.91%
	>2 ≤5 years	39	45.35%
	>5 years	23	26.74%

With 86 valid responses, this research will proceed to a more in-depth analysis stage. Most of the data was obtained from male respondents; as much as 54.65% of the responses were considered valid. Much of this underrepresentation may reflect the dynamics of industries or sectors that are more male-dominated. Regarding work experience, most respondents had experience ranging from more than >2 ≤5 years in blockchain institutions, reaching 45.35%. The subsequent analysis process will involve applying sophisticated statistical techniques to extract more profound insights into adopting blockchain technology in the corporate sector.

2.3 *Hypothesis Development*

This research study involves 10 hypotheses related to blockchain adoption in business. Each hypothesis will likely target a specific relationship between factors identified in the literature as necessary for technology adoption.

Security (SC) in blockchain technology is closely related to Perceived Usefulness (PU), as solid security measures, such as advanced encryption and secure consensus algorithms, increase the integrity and confidentiality of data in the blockchain. This, in turn, increases users' trust in the technology, making them more likely to consider blockchain as a helpful tool. The more secure users are regarding a technology, the greater the benefits of the technology in improving work performance and obtaining other benefits due to reduced risk of data breaches or unauthorized access [21]. Therefore, the effectiveness of security measures directly influences the perceived usefulness of blockchain technology among its users. So, the research hypothesis is proposed as follows.
H1: Security (SC) technology has a significant effect on the Perceived Usefulness (PU) of blockchain technology.

In this context, PEU refers to potential users believing that using blockchain technology. When SC steps are easy to use and seamlessly integrated, it can make the overall technology seem more approachable and easy to use [22]. If users find it easy to ensure their transactions are secure without understanding complex security protocols, they may discover blockchain technology

more straightforward to use. Therefore, the hypothesis is put forward that it can improve the overall ease of use and encourage the adoption of blockchain technology.
H2: Security (SC) technology has a significant effect on Perceived Ease of Use (PEU) for adopting blockchain technology.

SC in a robust and reliable blockchain system can increase user trust, an essential factor in BI. If users believe that a blockchain system is secure and their data is protected from unauthorized access or fraud, they are more likely to have the intention to use the technology. This is because trust plays a crucial role in accepting and adopting new technologies, especially those related to transactions and sensitive data, such as blockchain [23]. So, a hypothesis is put forward to strengthen the trust factor that will encourage further use of blockchain technology..
H3: Security (SC) technology has a significant effect on Behavior Intention to Use (BI) to adopt blockchain technology.

TRI refers to the extent to which an individual can experiment with a new technology before fully adopting it. Trialability allows potential users to explore the technology's features, capabilities, and limitations on a limited basis, which can alleviate uncertainties about its performance and usefulness. In the Technology Acceptance Model (TAM) context, PU is defined as the degree to which a person believes that using a particular technology will enhance their job performance or the attainment of a goal. Therefore, the research formulated the following hypothesis.
H4: Trialability (TRI) has a significant effect on the Perceived Usefulness (PU) of blockchain technology.

TRI and PEU are closely related in the context of technology acceptance [24]. Before adopting them fully, TRI allows potential users to test and try out new technologies, such as blockchain. By trying the technology first, users can gain hands-on experience with its interface and functionality, which helps them understand how the technology works. With that, the following hypothesis is proposed.
H5: Trialability (TRI) has a significant effect on Perceived Ease of Use (PEU) of blockchain technology.

TR is the extent to which a person can experiment with a technology before fully committing. When TRI is high, potential users can explore blockchain functionality, gain hands-on experience, and evaluate its relevance to their needs without full-scale implementation. Meanwhile, BI estimates a person's possibility of using a technology. This significantly predicts whether someone will adopt and use new technology. The relationship between TRI and BI is based on the idea that hands-on experience through testing can reduce uncertainty and increase understanding of the technology. So, this research requires the following hypothesis.
H6: Trialability (TRI) has a significant effect on Behavior Intention to Use (BI) to adopt blockchain technology.

CS refers to the company's overall satisfaction with its current operations, systems, and technology solutions. It encompasses the company's contentment with how their needs are met and how effectively their processes are running. PU This is the degree to which a user believes that using a particular technology will enhance their job performance or the company's performance. When a company is satisfied with its current operations, it may be more open to perceiving new technologies as valuable, especially if they align with the company's goals and potentially enhance already efficient processes. So, the following hypothesis is proposed.
H7: Company Satisfaction (CS) has a significant effect on Perceived Usefulness (PU) of blockchain technology.

CS represents the degree to which a company is content with its current systems and processes. High company satisfaction indicates that the existing solutions effectively meet the company's

needs. Different from PU, this is the extent to which potential users believe that using a particular technology will not require extensive effort. It reflects the user's belief that the technology will be easy to learn and operate. When a company is generally satisfied with its operational systems, it may have a culture that encourages efficient and user-friendly solutions. If blockchain technology is introduced in such an environment, the company's satisfaction with their systems could positively predispose them to find the technology easy to use. With that, the following hypothesis is proposed.
H8: Company Satisfaction (CS) has a significant effect on Perceived Ease of Use (PEU) of blockchain technology.
CS reflects a company's overall approval of its current operational systems and processes. When a company is satisfied, it implies that its needs are being met effectively and efficiently by the existing systems. BI This measures the likelihood that individuals or companies will use a specific technology in the future. The more satisfied a company is, the more likely it is to have a solid intent to implement blockchain, assuming the company views the technology as a beneficial addition to its current operations. This hypothesis will be tested by measuring behavioural intentions to use blockchain among companies with different satisfaction levels.
H9: Company Satisfaction (CS) has a significant effect on Behavior Intention to Use (BI) blockchain technology.

PEU is the degree to which a person believes using a particular system would be effort-free. It encompasses the user's belief that the technology can be easily operated. Meanwhile, PU is the degree to which a person believes using a particular system will enhance their job performance or provide benefits. Thus, ease of use enhances the user's experience, positively affecting their perception of the technology's usefulness. The following research hypothesis is proposed.
H10: Perceived Ease of Use (PEU) has a significant effect on Perceived Usefulness (PU) of blockchain technology.

These hypotheses provide a basis for empirical testing, where data can be collected and analyzed to test the significance of the relationships between variables in a technology adoption model. The results of this test can provide valuable insights for designing blockchain technology adoption strategies in a business context.

2.4 Structural Equation Modeling (SEM)

SEM is a multivariate statistical technique combining factor regression analysis. It aims to test the relationships between variables in a model, whether between indicators and their constructs or the relationships between constructs. This research uses SEM to gain valuable insights into complex relationships.

Table 2 Variance Inflation Factor (VIF) Results

Construct	Collinearity Statistic (VIF)					
	CS	BI	PEU	PU	SC	TRI
Company Satisfaction (CS)			12.299	12.299	12.385	
Behaviour Intention to use (BI)						
Perceived Ease of Use (PEU)					8.336	
Perceived Usefulness (PU)						
Security (SC)			9.273	9.273	10.403	
Trialability (TRI)			20.138	20.138	22.097	

In evaluating the construction of Table 2, the Variance Inflation Factor (VIF) plays a critical role. VIF is employed to identify the presence and extent of multicollinearity among constructs, which is a condition where predictor variables are highly correlated [19]. Multicollinearity can lead to inflated variances of the estimated coefficients in regression models, yielding unstable results and complex interpretation [20]. The VIF values for the constructs in question CS, PEU, SC, and TRI are considerably above the commonly accepted thresholds, indicating significant multicollinearity. CS shows a VIF of 12.299, PEU is at 8.336, SC ranges between 9.273 and 10.403, and TRI exhibits the highest VIF values of 20.138 and 22.097. Such high VIF values suggest that the model may suffer from multicollinearity issues, which necessitates further investigation and possible model adjustment to ensure accurate and reliable results. The identification and rectification of multicollinearity are thus vital steps before proceeding to test the structural model within PLS-SEM.

3. RESULTS AND DISCUSSION

This research tested the model using SmartPLS 4.0 software, a statistical analysis tool used to evaluate and test measurement and structural models in path analysis. SmartPLS 4.0 allows exploring relationships between variables in a model by examining their interrelationships and impacts [25].

3.1 Reliability and Validity

Reliability refers to the extent to which a measurement instrument or data collection method provides consistent and reliable results. In the context of measurement, reliability reflects the stability and consistency of results obtained from the same instrument or method when repeated on the same subject or situation. Validity demonstrates the extent to which an instrument or measurement method measures what it intends to measure. Validity supports the validity of the interpretation and use of measurement results.

Table 3 . Reliability and Validity

Construct	CA	CR	AVE
Company Satisfaction (CS)	0.912	0.913	0.741
Behaviour Intention to use (BI)	0.898	0.905	0.712
Perceived Ease of Use (PEU)	0.925	0.926	0.777
Perceived Usefulness (PU)	0.919	0.919	0.755
Security (SC)	0.899	0.903	0.714
Trialability (TRI)	0.913	0.914	0.742

In the context of the research analysis referenced by Table 3, the constructs under examination have demonstrated robustness in reliability and validity, surpassing the generally accepted thresholds in quantitative research. CR and AVE serve as the primary metrics for this evaluation. The standard value for CR is 0.7, which signifies a high level of internal consistency among the indicators of a construct, while for AVE, a value above 0.5 indicates that a majority of the variance in the indicators can be attributed to the underlying construct, thus ensuring sufficient convergent validity. The analysis results show that the constructs CS, BI, PEU, PU, SC and TRI have CR values ranging from 0.898 to 0.925. These figures not only meet but exceed the threshold of 0.7, reflecting high reliability. This suggests that the measurement instruments used in the study are the questions or observations designed to represent each construct consistently and reliably capture the essence of the intended constructs. Furthermore, the AVE values achieved by these constructs range between 0.712 and 0.77, comfortably above the minimum value of 0.5. Such AVE results indicate that a substantial portion of the variance in the observed variables is accounted for by the constructs they are supposed to reflect. This level of convergent validity is critical as it confirms that the constructs are well-defined by their indicators and capture the primary build, not some other variance. The constructs within the model exhibit psychometric solid properties, as evidenced by their CR and AVE scores. Such findings indicate a well-constructed measurement model within the SEM framework, where the constructs are reliable and valid. High reliability ensures that if the measurement were repeated, it would yield similar results, while adequate validity ensures that the constructs measure what they should measure. The surpassing of these thresholds confirms the robustness of the model and the measurement instruments, providing a solid foundation for the subsequent analysis of the structural model that seeks to unravel the causal relationships between these constructs and their impact on adopting blockchain technology in business [30].

3.2 Discriminant Validity

Discriminant validity is usually used to evaluate how much a construct can be differentiated from other constructs in a model or measurement. Discriminant validity ensures that a construct has a higher correlation with the indicators that form it than with indicators of other constructs. The following is a general explanation related to the information found in Table 4.

Table 4 Discriminant Validity

Construct	CS	IT	PEU	PU	SC	TR
CS	0.861					
BI	0.923	0.844				
PEU	0.900	0.896	0.877			
PU	0.941	0.873	0.891	0.869		
SC	0.907	0.863	0.918	0.978	0.845	
TR	0.958	0.9	0.93	0.961	0.945	0.861

The table results show that it has a lower correlation value than the square root of the AVE of each construct. **The correlation value** between CS and BI is 0.923, lower than the square root of the AVE of CS (0.861) and BI (0.844). **This shows** that CS and IT have good discriminant validity because their correlation is lower than the square root of their respective AVE.

3.2 Structural Model

This figure represents the hypothesized relationships between several constructs in the proposed theoretical model. The model is designed to evaluate the factors that influence the BI of a particular technology or system. The SC, TRI, and CS constructs are positioned as predecessors of PU and PEU, which in turn are considered to influence BI.

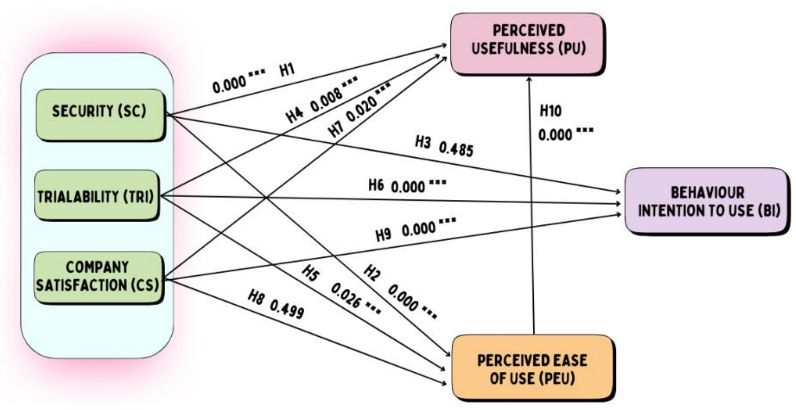

Figure 2 Structural Model

Based on Figure 2, depicts a conceptual model illustrating the relationships between various constructs based on hypothesis testing, which is commonly used in research studies to determine the influence of certain factors on user behavior. The constructs SC, TRI, and CS are particularly salient in this context. Blockchain, a technology highly regarded for its security features, makes SC a critical factor in its adoption. The hypothesis testing results, with p-values at 0.000, suggest an overwhelmingly significant impact of security perceptions on the PU and PEU of blockchain technology within business settings. This aligns with blockchain's inherent characteristics, such as decentralization, immutability, and transparency, which are designed to bolster security and trust in business transactions. The model's substantial path coefficients related to TRI suggest that businesses value the opportunity to evaluate blockchain technology through a testing phase, which can significantly affect their perceptions of its usefulness and ease of use. In the case of blockchain adoption, CS might encompass satisfaction with the technology provider, the integration process, and the ongoing support, all of which can influence the perceived merits of the technology and its integration into business processes. The rigorous statistical validation of these relationships, marked by high levels of significance ($p<0.001$), underscores the robustness of the SEM approach in providing empirical evidence for the factors that drive blockchain technology adoption in business. Each construct is connected by arrows indicating the direction of influence, with associated p-values provided to show the statistical significance of the relationships. For instance, SC significantly influences both PU ($p=0.000$) and PEU ($p=0.000$), as indicated by the hypotheses H1 and H6, respectively. The model also quantifies the influence with a path coefficient for the relationship between PU and BI, which is quite strong (0.485), as denoted by H3. The asterisks represent the significance level, with three indicating a significant result ($p<0.001$). This model is instrumental in understanding the factors that drive user adoption of a technology or service and can be pivotal for the strategic planning of companies looking to enhance user engagement and satisfaction. The findings of this study are not merely academic; they offer actionable insights for technology developers, business strategists, and policymakers aiming to promote or implement blockchain solutions. By understanding the determinants of blockchain adoption, stakeholders can design targeted interventions to improve the technology's perceived usefulness and ease of use, thereby enhancing its acceptance and integration into business practices.

3.2 Hypothesis Testing Results

This research examining 10 hypotheses that try to explain the relationship between various variables in the context of the research conducted. These hypotheses are designed to investigate and understand the interrelationships between the factors studied.

Table 5 Hypothesis Result

Hypothesis	Relationships	O	M	STDEV	T	P	Result
H1	CS -> IT	0.744	0.759	0.144	5.172	0.000	Supported
H2	CS -> PEU	0.101	0.108	0.15	0.677	0.499	Not Supported
H3	CS -> PU	0.257	0.255	0.067	3.81	0.000	Supported
H4	PEU -> PU	-0.252	-0.251	0.064	3.96	0.000	Supported
H5	SC -> IT	0.102	0.088	0.146	0.698	0.485	Not Supported
H6	SC -> PEU	0.368	0.357	0.159	2.318	0.020	Supported
H7	SC -> PU	0.739	0.747	0.063	11.767	0.000	Supported
H8	TR -> IT	0.09	0.088	0.175	0.516	0.606	Not Supported
H9	TR -> PEU	0.485	0.487	0.218	2.221	0.026	Supported
H10	TR -> PU	0.251	0.244	0.094	2.662	0.008	Supported

The results T of the analysis show that this hypothesis is supported, with a significant p value ($p < 0.05$), indicating a significant relationship between customer satisfaction and information technology. On the other hand, (H2) which connects CS with PEU cannot be supported, because the p value is > 0.05. Then (H3) shows that CS has a positive relationship with PU, and the analysis results support this hypothesis with a significant p value. H4, which indicates a negative relationship between PEU and PU, is also supported by the data. However, H5 linking SC with BI cannot be supported, because the p value is > 0.05. Meanwhile, the positive relationship between SC and PEU (H6) is supported, and the positive relationship between system complexity and perceived usefulness (H7) is also supported by a significant p value. Furthermore, H8 linking TRI with BI could not be supported, while the positive relationship between TRI and PEU H9, as well as between task relevance and PU (H10), was supported by the data, with significant p values. Thus, the results of the statistical analysis provide in-depth insight into the relationships between the variables in this study, providing a better understanding of the factors that influence customer satisfaction, perceived ease of use, and perceived usefulness in the context of information technology.

4. CONCLUSIONS

This paper aims to determine the factors influencing the adoption of blockchain technology in businesses using Structural Equation Modeling (SEM) through SmartPLS 4.0 software. The study aimed to understand the direct and indirect effects of customer satisfaction (CS), system complexity (SC), trialability (TRI), perceived ease of use (PEU) and perceived usefulness (PU) on the behavioural intention (BI) to adopt blockchain technology. The findings of research constructs such as CS, SC, TRI, PEU, and PU demonstrated high reliability and validity, with Composite Reliability (CR) values ranging from 0.898 to 0.925 and Average Variance Extracted (AVE) values between 0.712 and 0.77. Discriminant validity was confirmed, as constructs had stronger correlations with their indicators than with other constructs. The study's hypothesis testing revealed several significant relationships, with security concerns (SC) and trialability (TRI) having a considerable impact on both perceived ease of use (PEU) and perceived usefulness (PU). The research supported the hypotheses that CS positively influences BI and PU, while a negative relationship between PEU and PU was also confirmed. Some theories, such as the ones linking SC with BI and TRI with BI, were not supported. The implication contributes to the literature on technology adoption by integrating constructs specific to blockchain technology, such as security concerns and trialability, within an SEM framework. It also extends the understanding of how customer satisfaction influences the behavioural intention to adopt new technologies. From a practical perspective, these findings guide blockchain technology developers, business strategists, and policymakers. By knowing the determinants of blockchain adoption, stakeholders can design targeted interventions to increase the technology's usability and ease of use, thereby increasing its acceptance and integration into business practices. Highlighting blockchain security in marketing communications can emphasize the added value it provides to potential users. Future research could enrich the model by including moderating variables such as user trust, prior technology experience, and industry characteristics that may influence the relationships between CS, SC, TRI, PEU, and PU. This will enable a deeper understanding of how contextual variables influence technology adoption. In addition, this approach can help understand how perceptions and intentions to adopt blockchain evolve. This is especially relevant considering that blockchain is still in the early stages of adoption in many industries. This research could also include cross-industry comparisons to see how factors influencing blockchain adoption vary between sectors. Considering changing market dynamics and technological advances, follow-up studies should explore the influence of external factors, such as regulatory changes and competitive pressures, and internal organizational influences, such as innovation culture and leadership, on blockchain technology adoption.

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