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User Awareness and Understanding of Blockchain Security in Financial Transactions

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User Awareness and Understanding of Blockchain Security in Financial Transactions

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Abstract— **Blockchain technology is characterized by decentralized governance and security, which leads to the transformation of financial transactions, increases transparency, and reduces the possibility of regulation. This study examines how consumers understand and view blockchain security in the financial sector and highlights the factors that encourage or hinder consumers' adoption of blockchain. This study differentiates itself from previous studies by combining consumer factors (such as trust, ease of use, and teaching models) with management and social influence in a different way. This study uses a process analysis method to develop a comprehensive system that combines technology and people and provides suggestions for improving the use of blockchain in the financial sector. The main findings show that management support plays an important role in increasing trust and improving ease of use. However, trust has been shown to have a positive impact on consumers' intention to adopt blockchain technology. Other factors affecting usability include perceived ease of use, perceived usefulness, and appropriate design. This study fills a gap in the blockchain literature by developing a Technology Acceptance Model (TAM) through the integration of management and social relationships. This study demonstrates the importance of management support and user trust and ease of use in the process, unlike previous research. The findings highlight the interaction between leadership, management, and performance when using blockchain technology, providing practical advice to policy makers and process developers.**

Keywords— Blockchain Technology, Financial Transactions, Technology Acceptance Model (TAM), Perceived Trust, Regulatory Support

I. INTRODUCTION

Blockchain technology Blockchain technology has emerged as a revolutionary technology that offers unique features such as decentralization, security, and transparency. Blockchain was initially thought to be the basis of cryptocurrencies such as Bitcoin, but its applications have since expanded to many areas, especially financial transactions. These resources make it useful in solving long-standing problems of fraud, inefficiency, and lack of transparency in finance [1], [3], [9]. Blockchain remains a challenging issue in the financial sector. Public awareness and understanding of blockchain security mechanisms such as encryption and decentralized authentication are important to bridge the gap between potential and real-world applications [1], [3], [9]. However, misunderstandings and lack of knowledge among users may hinder adoption, especially in emerging markets such as India, where proper regulation plays a significant role [15], [16]. The urgent need for the problem. By combining the Technology Acceptance Model (TAM) with factors such as reliability, ease of use, and learning models, this study provides a comprehensive framework for accessing high user behavior [14], [22]. Unlike previous studies that usually focus on operations, this study emphasizes the human and management dimensions to provide a perspective for promoting blockchain adoption [15], [16], [19]. Provide the best place for this research. With the ongoing development of digital marketing and the popularity of financial services, it is important to understand how management supports and influences individuals' behavior patterns [19], [23]. This research not only contributes to the academic discussions on blockchain use, but also provides recommendations for policy makers, developers, and financial institutions to increase reliability, validity, and control precision [15], [22].

In summary, this research aims to fill the gap between the potential of blockchain technology and consumers' use for leadership purposes. By emphasizing the interplay of relationships, relations, and governance, it lays the foundation for the safe, efficient, and acceptable use of blockchain in business [15], [22], [23].

II. LITERATURE REVIEW

A. Technology Acceptace Model

The Technology Acceptance Model (TAM) suggests that two main factors perceived usefulness and perceived ease of use influence the intention to adopt technology [10], [11]. Perceived usefulness refers to how much a user believes the technology will enhance their performance, while ease of use relates to how effortless it is to engage with it [12]. The model posits that users are more likely to adopt a technology if they find it both useful and easy to use [13].

TAM has been applied across sectors like e-commerce, healthcare, and education, demonstrating that the simplicity of technology and its utility influence adoption [14]. For blockchain, usefulness may involve benefits like faster transactions, enhanced security, and transparency, whereas ease of use focuses on the user interface and ease of interaction [20], [22].

This study employs TAM to assess how these elements along with subjective norms (social influence) and trust shape behavioral intention toward blockchain adoption in financial transactions. Recognizing these drivers will help create more user-centered blockchain applications, boosting adoption and trust [19], [21], [23].

B. Blockchain

Blockchain is a form of a database system in which information is stored in a chain block structure. Each block

comprises the verified details of transactions and is connected to the previous block using a special code called a hash. That is, any change in the information of one block will alter the hash to be used, which means changing the entire chain and confirming the shift in the network's consensus regarding the data reliability. [1]

Blockchain is an immutable record-keeping platform, which provides the highest level of security and transparency to track assets, transactions, and other data in business networks. It is less likely to happen to failures and attacks due to its decentralized feature. This eliminates intermediaries. Because of this characteristic, blockchain technology has more benefits in industries related to [1], [4].

C. Regulatory Support

Regulatory support infuses confidence and develops trust in blockchain technology as far as financial transactions are concerned. It either supports or hinders the development and utilization of blockchain-based solutions. Hence, the a demand for diverse regulations covering an assurance of safety and stability in blockchain-based transactions. [15]

Some of the regulatory challenges that blockchain technology and the use of cryptocurrency have faced in financial transactions involve the need for guidelines on how to use blockchain technology in financial transactions, uncertainty about the true regulatory status of blockchain-based assets, and even over-regulation. [5], [15], [16].

D. Perceived Trust

Perceived trust is an individual's subjective belief in a system's dependability, security, and integrity. The perceived level of trust has a significant impact on consumers' acceptance of Bitcoin payment methods. Trust levels are significantly impacted by anonymity, transaction traceability, and information privacy threats. Concerns about security fraud are recognized, but they have less of an impact on trust than those about privacy. Promoting adoption requires addressing privacy concerns with robust protections and transparent transactions [15], [16].

Consumers are very concerned about privacy because they worry that their information can be exploited or accessed by unauthorized individuals. The anonymity factor is something consumers love, while transparency prevents fraud. What the consumer would wish to have is a balance where all the transactions are completely anonymous, yet with sufficient transparency such that all transactions are verifiable to enhance trust. Traceability provides security and accountability; however, at times these kinds of measures raise questions about privacy. In that respect, due balance needs to be achieved. If the privacy-related issues are focused on and there is complete transparency in transactions, then a long way maybe traveled to gain consumers' trust for crypto-payment-wide adoption [15]-[17], [21].

E. Perceive Ease of Use

Perceived ease of use refers to the attitude of the users toward the simplicity of the interaction with the blockchain systems. This perception is influenced by factors such as user interface, transaction processes, educational material, and feedback. [19], [22]. Development of user-friendly interfaces, simplifying transactions, offering training resources, and ensuring safety can enhance users' perception of ease of use, aiding the acceptance and adoption of blockchain-based technologies [23].

F. Perceive Usefulness

Perceived usefulness in blockchain refers to the subjective probability by which individuals believe that the technology could enable them to achieve gains in performance. These will be impacted by efficiency, transparency, security, innovation, interoperability, and disruptiveness. [19], [22]. Users evaluate whether blockchain streamlines operations boosts confidence through transparent records, or introduces innovative solutions. Developing positive views of these aspects is crucial for promoting broader adoption across sectors and use cases [23].

G. Subjective Norms

Subjective norms are the opinions of whether or not most people find the behavior to be acceptable. It has to do with whether a person believes their friends and other important people think they should engage in a particular behavior. Social pressure is typically greater for people who don't know much about a particular behavior, so they rely more on their closest friends and family members. Subjective norms can be divided into two categories: motivation to comply and normative beliefs [14], [19], [21].

Normative belief is a type of subject that whether or not the referent group approves the action. At the same time, motivation to comply is a type of subjective norm that the individual of the referent group may or may not comply with the surrounding act [14], [21].

H. Behavioral Intention

Behavioral intention refers to an individual's subjective likelihood or inclination to engage in a specific behavior. In the use of blockchain technology, this concept extends to users' intentions regarding their actions within blockchain ecosystems. For instance, it encompasses their willingness to use decentralized applications, participate in cryptocurrency transactions, or contribute to consensus mechanisms like mining or staking [16].

Understanding these objectives is critical for adapting blockchain solutions to user demands, increasing acceptance, and maintaining the long-term viability of decentralized networks. Perceived security, application usability, possible rewards, and regulatory concerns all have an impact on consumers' decisions to engage in the blockchain ecosystem [16]-[18], [23].

III. METHODS

A. Model

In this research, we adopt the Technology Acceptance Model, using this variable to see what factor that has most impact for the people to use blockchain technology. This Research Model has 7 hypothesis from 6 variables.

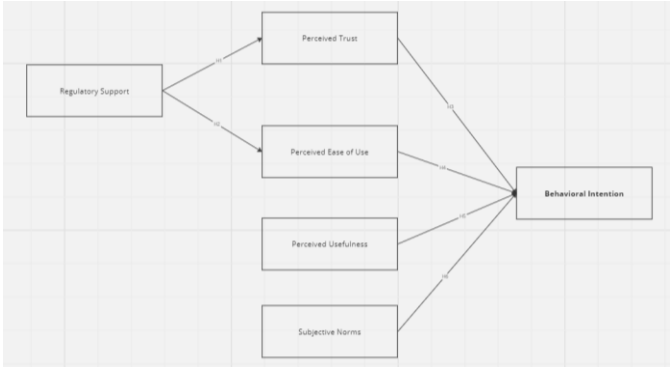

Fig 1. Model Building

B. *Operational Variables*

Based on the literature review and the development of the hypothesis above, the researcher proposes the model described in this fig 1. This model has three independent variables, a mediating variable and a dependent variable.

TABLE I. VARIABLES AND INDICATORS

	Description	Ref
RS	Regulatory Support	
RS 1	Regulatory support for blockchain innovation	[5][15][16]
RS 2	Effective enforcement of regulations	[5][15][16]
RS 3	Regulatory clarity and consistency	[5][15][16]
RS 4	Transparency in regulatory decisions	[5][15][16]
RS 5	Public awareness about blockchain regulations	[5][15][16]
PT	Perceived Trust	
PT 1	Trust in blockchain technology's security	[15][16][17][21]
PT 2	Trust in blockchain technology transparency	[15][16][17][21]
PT 3	Trust in blockchain technology integrity	[15][16][17][21]
PT 4	Trust in blockchain technology reliability	[15][16][17][21]
PT 5	Trust in blockchain technology accountability	[15][16][17][21]
PEU	Perceived Ease of Use	
PEU 1	Anticipated Ease of Use	[19][22][23]
PEU 2	Confidence in understanding	[19][22][23]
PEU 3	Likelihood of Grasping Concepts	[19][22][23]
PEU 4	Priotization of User-Friendly Design	[19][22][23]
PEU 5	Anticipation of Interface Clarity	[19][22][23]
PU	Perceived Usefulness	
PU 1	Expected Record Accuracy	[19][22][23]
PU 2	Expected Efficiency	[19][22][23]
PU 3	Expected Security	[19][22][23]
PU 4	Satisfaction with Information	[19][22][23]
PU 5	Likelihood of Offering Advantages	[19][22][23]
SB	Subjective Norms	
SB 1	Affected by Family & Friends	[14][19][21]
SB 2	Affected by Community	[14][19][21]
SB 3	Affected by Social Media	[14][19][21]
SB 4	Affected by Professional	[14][19][21]
SB 5	Impact of Knowledge About Blockchain	[14][19][21]
BI	Behavioral Intention	
BI 1	Intent to Adopt blockchain technology for financial transactions	[16][17][18][23]
BI 2	Intentions Regarding Adoption Over Time	[16][17][18][23]
BI 3	Intent to recommend blockchain technology for financial transactions to others	[16][17][18][23]
BI 4	Intent to learning about blockchain technology	[16][17][18][23]
BI 5	Perception of Future Usefulness	[16][17][18][23]

C. *Data Sample and Collection*

Primary data were collected through a Google Form survey, targeting respondents familiar with financial technology and blockchain. A purposive sampling method was used to ensure relevant responses, resulting in a total of 150 respondents. Secondary data were gathered from academic journals, industry reports, and credible online resources to support the research context.

D. *Design analysis and the hypothesis*

Structural Equation Modeling (SEM) and Partial Least Square (PLS) with the Smart-PLS 4 program were the multivariate statistics employed in this study. A different approach to overcoming the link between complicated variables is PLS. The connection between dependent variables (endogenous) and independent factors (exogenous) is explained using (PLS-SEM).

Hypotheses :

H_1: Regulatory Support will positively influences Perceived Trust about Blockchain

H_2: Regulatory Support will positively influences Perceived Ease of use about Blockchain

H_3: Perceived Trust will positively influences the Behavioral Intention about Blockchain

H_4: Perceived Ease of Use will positively influences the Behavioral Intention about Blockchain

H_5: Perceived Usefulness will positively influences the Behavioral Intention about Blockchain

H_6: Subjective Norms will positively influences the Behavioral Intention about Blockchain

IV. DISCUSSION

A. *Measurement Model: Valid and Reliability*

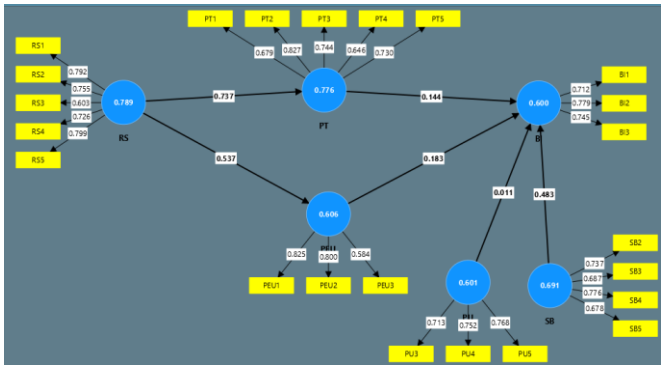

Fig 2. Model Path CoefficieOutputput

TABLE II. CONSTRUCT VALIDITY AND RELIABILITY

No.	Construct	Cross Loading	AVE	CR	CA
1.	BI		0.556	0.790	0.600
	BI1	0.712			
	BI2	0.779			
	BI3	0.745			
2.	PEU		0.554	0.785	0.606
	PEU1	0.825			
	PEU2	0.800			
	PEU3	0.584			
3.	PT		0.530	0.848	0.776
	PT1	0.679			
	PT2	0.827			
	PT3	0.744			
	PT4	0.646			
	PT5	0.730			
4	PU		0.554	0.789	0.601
	PU3	0.713			
	PU4	0.752			
	PU5	0.768			
5	RS		0.546	0.856	0.789
	RS1	0.792			
	RS2	0.755			
	RS3	0.603			
	RS4	0.726			
	RS5	0.799			
6	**SB**		0.519	0.812	0.691
	SB2	0.737			
	SB3	0.687			
	SB4	0.776			
	SB5	0.678			

The validity and reliability assessment in SEM involves evaluating Convergent Validity through Average Variance Extracted (AVE), Discriminant Validity using Cross Loadings, Composite Reliability (CR), and Cronbach's Alpha (CA). For acceptable validity and reliability, CR and cross-loadings should generally be greater than 0.6, Cronbach's Alpha should be above 0.7, and AVE should exceed 0.5.

Seven indicators (BI1, BI2, PEU4, PEU5, PU1, PU2, and SB) were found to be invalid due to having loading factor values below 0.6. Table II indicates that all variable indicators are reliable, with Composite Reliability values ranging from 0.785 to 0.856, and exhibit convergent validity with AVE values between 0.519 and 0.556. The constructs' composite reliability values range from 0.763 to 0.898, indicating good reliability. The AVE values are between 0.519 and 0.556, while Cronbach's Alpha values include 0.908, with others ranging from 0.600 to 0.789. Only the seven indicators mentioned failed to achieve internal consistency in terms of validity and reliability.

TABLE III. PATH COEFFICIENT

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)
RS => PEU	0.537	0.523	0.093	5.773
RS => PT	0.737	0.737	0.065	11.372
PEU => BI	0.319	0.309	0.123	2.598
PT => BI	0.382	0.368	0.132	2.887
SB => BI	0.535	0.531	0.076	7.069
PU => BI	0.300	0.297	0.092	3.275

Based on Table III shows that all hypothesis is accepted and is significant. The t value acceptable value is 1.96 at a 95% confidence level.

1. *H1 is accepted*: Regulatory Support (RS) positively influences Perceived Trust (PT) about Blockchain.
2. *H2 is accepted*: Regulatory Support (RS) positively influences Perceived Ease of Use (PEU) about Blockchain.
3. *H3 is accepted*: Perceived Trust (PT) positively influences Behavioral Intention (BI) to use Blockchain.
4. *H4 is accepted*: Perceived Ease of Use (PEU positively influences Behavioral Intention (BI) to use Blockchain.
5. *H5 is accepted*: Perceived Usefulness (PU) positively influences Behavioral Intention (BI) to use Blockchain.
6. *H6 is accepted*: Subjective Benefits (SB) positively influences Behavioral Intention (BI) to use Blockchain.

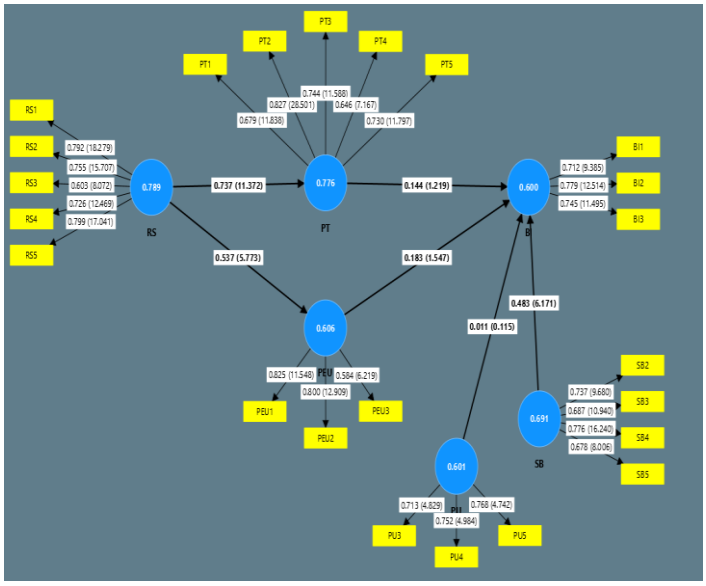

Fig 3. Path Coefficient & t-test value of Model

B. Regulatory Support to Perceived Trust about Blockchain

This study confirms that regulatory support (RS) positively influences perceived trust (PT), with a CR value of 11.372. Well-defined legal regulations, compliance provisions, and government endorsements instill confidence in blockchain systems, particularly in financial transactions. Regulatory clarity assures users of the system's reliability, transparency, and resistance to fraud, reducing concerns over risks such as fraud or hacking. This finding also contributes to the theoretical extension of the Technology Acceptance Model (TAM) by demonstrating that external governance frameworks significantly shape perceived trust in emerging technologies. Unlike traditional TAM studies, which emphasize internal perceptions like ease of use and usefulness, this research highlights regulatory support as a pivotal external determinant of trust. Future research could explore how specific regulatory measures, such as data privacy laws or industry standards, further enhance trust in blockchain systems across different socio-economic contexts [5], [15], [16], [22].

C. Regulatory Support to Perceived Ease of Use about Blockchain

This study confirms that regulatory support (RS) positively influences perceived ease of use (PEU), with a CR value of 5.773. Regulatory clarity simplifies user interactions with blockchain systems by reducing perceived complexity, particularly for non-technical users. Clear policies and guidelines help users feel confident navigating blockchain platforms without requiring extensive technical expertise. From a theoretical perspective, this finding extends the Technology Acceptance Model (TAM) by highlighting regulatory clarity as a critical external factor influencing ease of use, particularly for complex technologies like blockchain. While traditional TAM applications primarily focus on internal user perceptions, this research demonstrates the significant role of external governance in shaping user adoption. Future research could explore additional regulatory or socio-cultural influences to refine the TAM framework further and ensure its applicability to emerging technologies in diverse contexts [16], [19], [21], [22].

D. Perceived Trust to Behavioral Intention to use Blockchain

This study confirms that the perceived trust (PT) positively influences behavioral intention (BI) to accept blockchain technologies, the CR value was 2.887. Users tend to like the use of the blockchain in conducting financial transactions and carrying out smart contracts when the blockchain platform is effective and trustworthy. Trust reduces the risk that potential users of blockchain technology perceive, thus facilitating its acceptance [17], [20], [21].

E. Perceived Ease of Use to Behavioral Intention to use Blockchain

The study confirms that perceived ease of use (PEU) positively influences behavioral intention (BI), with a CR value of 2.598. The more user-friendly the interfaces and processes, the more blockchain technology is likely to be adopted, especially for non-technical users. Less cognitive effort means less anti-tech race expectations, which leads to more contentment with and involvement in new technologies [21], [22].

F. Perceived Usefulness to Behavioral Intention to use Blockchain

The study confirms that perceived usefulness (PU) positively influences behavioral intention (BI), with a CR value of 3.275. The users are willing to embrace blockchain technology on the premise that tangible benefits associated with such aspects as faster transactions, enhanced security and even cutting down costs. Practical benefits drive enthusiasm and integration of blockchain into both business and personal processes [15], [22].

G. Subjective Benefits to Behavioral Intention to use Blockchain

The study confirms that subjective benefits (SB) positively influence behavioral intention (BI), with a CR value of 7.069. Users will go on to embrace blockchain technology because they see the personal or social benefits, for instance, better control over finances or enhanced social image. These benefits are what make people interested and active in using blockchain technology [22].

H. Real-World Use Case: Blockchain in Financial Transactions

This study's findings highlight the importance of regulatory clarity and user-friendly designs in driving blockchain adoption. Platforms like Ripple Net exemplify how consistent regulations build user trust and confidence, particularly in financial transactions [24]. Policymakers should focus on clear, localized rules to reduce fraud risks and encourage compliance, especially in diverse socio-economic contexts like Indonesia [15], [16].

For developers, simplifying interfaces can reduce adoption barriers for non-technical users, especially in applications like remittance services and microfinance. Features such as multilingual support and visual aids can make blockchain systems accessible to rural users, enhancing trust and usability. Promoting successful use cases, such as fraud prevention and financial inclusion, can further strengthen social acceptance by addressing subjective norms [19], [21], [23].

These insights extend beyond financial transactions to applications in supply chain management, where regulatory clarity ensures product traceability, or digital identity systems, where robust governance frameworks enhance user trust. By addressing both technical and socio-regulatory dimensions, stakeholders can maximize blockchain's potential for innovation across industries [20], [24].

V. CONCLUSION

This research This research bridges the gap between blockchain technology capabilities and user challenges by integrating governance and relationships into a Technology Acceptance Model (TAM) framework. It demonstrates how governance support and trust play a key role in improving user behavior and offers recommendations to improve blockchain adoption through regulation, design, and quality public education. These findings highlight the importance of governance and relationships, particularly in promoting identity verification in technological systems such as blockchain [5], [16]. By expanding the TAM framework to include governance support and learning models, this study identifies key factors that drive adoption, such as maintaining clarity, ease of use, and social impact, while emphasizing its relevance to culture and environmental stewardship. Creating transparent and consistent regulations for policymakers can build trust and facilitate adoption [19], [22]. On the other hand, developers are encouraged to focus on user-friendly designs that make blockchain technology more accessible to non-technical users, facilitate widespread use, and more inclusive. In addition, educational programs can address customer concerns and well highlight blockchain benefits such as efficiency, security, and cost-effectiveness [16], [24]. It is crucial to extend this research to other areas such as supply chain management, healthcare, or digital systems, trust, and governance in the adoption of blockchain. Further research on the impact of socioeconomics and culture, or comparison of governance systems in different regions, can provide more insight into the current potential of blockchain. This research addresses both operational and human aspects and provides a comprehensive plan to promote secure, efficient, and user-friendly blockchain applications in the financial sector.

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