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The Role of Social Media Engagement in Shaping Blockchain Adoption: Insights from Thai Users

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Abstract

Purpose – This study examines the effect of social media engagement (SME) on blockchain technology adoption, focusing on awareness, trust, and perceived usefulness among Thai social media users.

Design/methodology/approach – Structural equation modeling (SEM) was employed to test six hypotheses using data from 400 Thai social media users collected via an online survey.

Findings – SME significantly increases blockchain awareness, which strongly influences adoption. However, SME did not directly affect trust or perceived usefulness. Trust moderately influenced adoption, while perceived usefulness was a key driver. Awareness is a critical mediator, indicating SME's limited direct impact on trust and usefulness.

Research limitations/implications – The cross-sectional design limits causal claims. Findings may not generalize beyond Thailand due to cultural and regulatory variations.

Practical implications – Marketers and policymakers should complement social media campaigns with deeper educational initiatives and trusted institutional backing to foster blockchain adoption.

Social implications – Insights inform strategies for responsible blockchain promotion, ensuring public understanding and trust in emerging digital technologies.

Relevance to Decision Sciences – The findings directly inform Decision Sciences by modeling the cognitive and social factors that drive user adoption decisions for complex, high-risk technologies, offering a new framework for predicting technology uptake in uncertain environments. Within the broader Decision Sciences field, this research specifically advances Information Systems and Management by demonstrating how digital engagement and behavioral data can be integrated into technology adoption models, providing actionable insights for system designers and managers seeking to enhance trust, awareness, and perceived usefulness in digital innovation ecosystems.

Originality/value – This study integrates social media engagement into TAM/UTAUT frameworks in an emerging market, refining adoption theory and offering evidence-based guidance for digital engagement in technology uptake.

Keywords: Social Media Engagement, Blockchain Technology, Information Systems Management, Structural Equation Modeling (SEM), Digital Communication

JEL Classifications: O33, D83, G20, O10, L86

1. Introduction

The increasing convergence of social media and blockchain technology represents a pivotal area of interest in managing contemporary digital information systems. Social media platforms, characterized by their vast user bases and dynamic content-sharing capabilities, have become integral to how information is disseminated and consumed. Concurrently, blockchain technology, with its promise of decentralized, transparent, and secure data management, is poised to revolutionize various sectors, including finance, healthcare, and supply chain management (Dutta et al., 2020). Understanding the intersection of these technologies is essential, particularly in how social media engagement (SME) influences the adoption and perception of blockchain technology. From an information systems standpoint, this intersection between digital communication environments and emerging technologies represents a crucial frontier for understanding how user engagement data, platform affordances, and institutional factors collectively shape technology diffusion.

In this study, SME is defined as the level of active participation and interaction by users on social media platforms, which includes activities such as commenting, sharing, and liking posts related to blockchain technology (Di Gangi & Wasko, 2016). SME reflects the extent to which users are involved with blockchain-related content, potentially shaping their awareness, trust, and perceived usefulness of the technology. The decision to undertake this study is motivated by the rapid advancements in both social media and blockchain technologies. Social media has transformed from a mere tool for social interaction to a powerful platform for marketing, information dissemination, and community building, significantly shaping public opinion and influencing consumer behavior. As blockchain technology emerges as a disruptive force capable of addressing critical issues such as data security, transparency, and trust, understanding the factors that drive its adoption becomes increasingly important (Janssen et al., 2020). The adoption of blockchain technology is not merely a technical challenge but also a social one, where public perception and engagement play a vital role.

In the context of Thai social media users, exploring the impact of social media engagement on the adoption and perception of blockchain technology is particularly relevant. Thailand has seen a significant increase in social media usage, with platforms such as Facebook, Instagram, and X (formerly Twitter) being widely popular among its population (Charoensereechai et al., 2022; Katchapakirin et al., 2018; Thongmak, 2024). This makes it an ideal setting to study how social media interactions influence technology adoption (Puriwat & Tripopsakul, 2021).

Beyond its social media ubiquity, Thailand also offers a uniquely supportive legal and economic ecosystem for blockchain innovation. Since 2018, the Thai Securities and Exchange Commission (SEC) has operated a digital-asset regulatory sandbox (Securities and Exchange Commission, 2024), and the 2018 Emergency Decree on Digital Asset Businesses established clear licensing rules for exchanges, ICOs, and custodians (Securities and Exchange Commission, 2018a, 2018b). At the same time, the national "Thailand 4.0" agenda—backed by Digital Park developments (True Digital Park, n.d.; United Nations Conference on Trade and Development, 2021) and the Bank of Thailand's Inthanon–LionRock CBDC

pilots—has funneled grants, tax incentives, and public–private partnerships into blockchain use cases in trade finance, supply-chain traceability, and digital identity (Hong Kong Monetary Authority & Bank of Thailand, 2020). These regulatory safeguards and economic stimuli, combined with Thailand's strong communal trust networks (Kananukul et al., 2015) and near-universal smartphone adoption (World Bank, 2022), make it not only a high-engagement social media market but also a live testbed where policy, culture, and commerce collide to shape real-world blockchain uptake.

Although TAM and UTAUT have guided decades of technology-acceptance research, no prior work has empirically tested social media engagement as an external antecedent within these models—especially in emerging economies. Past scholarship has emphasized organizational readiness or technical attributes, but left unexamined the specific ways digital interactions drive—or fail to drive—awareness, trust, and usefulness (Dutta et al., 2020; Janssen et al., 2020). This omission creates both a theoretical blind spot and a practical barrier: without quantifying SME's mediated effects, marketers and policymakers lack clear, evidence-based strategies for converting online buzz into real-world adoption. The systematic review and SEM analysis conducted in this study directly address this gap, advancing academic debate on digital engagement and generating transferable insights for similar contexts.

The importance of this study lies in its potential to inform strategies for promoting blockchain technology through social media channels. As businesses and governments seek to leverage blockchain for various applications, understanding the role of social media in facilitating its adoption can provide valuable guidance for crafting effective communication and engagement strategies. Additionally, this study contributes to the broader field of digital technology adoption by highlighting the interplay between social media engagement, trust, and perceived usefulness in the context of a cutting-edge technology like blockchain. This research contributes to Decision Sciences by providing an empirical model of the decision-making process for technology adoption, demonstrating how social media engagement indirectly shapes user choices through mediating variables like awareness, trust, and perceived usefulness, with particular relevance to the field of Information Systems and Management, where these behavioral insights inform the design and governance of digital platforms and technology adoption strategies.

This study is structured to investigate the mediating roles of awareness of blockchain technology, trust in blockchain technology, and perceived usefulness in the process of adopting blockchain technology. By delving into these mediating factors, the research aims to offer a comprehensive understanding of how social media engagement can influence the adoption and perception of blockchain technology among Thai social media users. This focus is particularly pertinent in today's digital age, where the synergy between social media and emerging technologies holds significant implications for both technological advancement and societal progress.

This study addresses a critical gap in existing research by examining the intersection of social media engagement and blockchain technology adoption. By focusing on the experiences and behaviors of Thai social media users, it aims to provide actionable insights that can enhance the understanding and promotion of blockchain technology in various contexts. The findings of this study are expected to

contribute to the growing body of knowledge on technology adoption and inform practical strategies for leveraging social media to drive the acceptance and utilization of blockchain technology.

2. Literature Review

The integration of blockchain technology with social media platforms has garnered significant attention in recent years as organizations and researchers seek to understand the implications of this convergence on various industries and societal interactions. By examining the existing literature on the roles of social media in blockchain technology adoption, valuable insights can be gleaned regarding the potential impact, challenges, and opportunities presented by this intersection.

Hisseine et al. (2022) delve into the application of blockchain technology in social media, shedding light on the various ways in which blockchain can enhance traceability and security within social media platforms. This review underscores the importance of understanding how blockchain can revolutionize data management and user interactions in the realm of social media, paving the way for enhanced transparency and trust among users. The study highlights that blockchain's decentralized nature can mitigate issues related to data breaches and privacy concerns prevalent in traditional social media platforms (Hisseine et al., 2022).

Moreover, Wang et al. (2019) provide a comprehensive overview of blockchain technology in the context of future supply chains, emphasizing the need for a deeper understanding of blockchain's mathematical and economic foundations. This systematic review highlights the potential for blockchain to transform supply chain management practices, pointing towards the relevance of blockchain adoption in enhancing operational efficiencies and transparency. Although focused on supply chains, the insights regarding transparency and trust are directly applicable to the integration of blockchain with social media platforms, where similar benefits can be realized (Wang et al., 2019).

In the context of digital payment systems, Norbu et al. (2024) explore the factors influencing trust and acceptance for blockchain adoption. This review offers valuable insights into consumer perceptions and behaviors towards embracing blockchain technology, emphasizing the pivotal role of trust in driving adoption decisions. Understanding the factors that shape trust in blockchain technology is crucial for fostering widespread adoption and acceptance among users, particularly in social media contexts where trust and transparency are paramount (Norbu et al., 2024).

However, the finding of this study that social media engagement did not directly enhance trust diverges from these earlier reviews. This discrepancy likely reflects Thailand’s specific context, where users often approach novel financial technologies with caution due to past experiences with unregulated digital schemes and lingering uncertainty around blockchain regulations (Puriwat & Tripopsakul, 2021). Moreover, much of the online conversation remains high-level “buzz” rather than detailed, locally relevant case studies or endorsements from credible institutions. In the absence of clear success stories or formal regulatory assurances, mere engagement—likes, shares, or comments—fails to overcome baseline skepticism, explaining why SME alone does not translate into increased trust among Thai users.

Dowelani et al. (2022) focus on factors influencing blockchain adoption in the South African clearing and settlement industry, highlighting the concept of relative advantage in relation to blockchain adoption costs. By examining the role of organizational readiness, top management support, and organizational size in influencing blockchain adoption, this study underscores the multifaceted nature of factors that drive technology adoption decisions. These findings can be extrapolated to understand the complexities involved in adopting blockchain technology within social media platforms, where organizational readiness and leadership support are equally critical (Dowelani et al., 2022).

Furthermore, Falwadiya and Dhingra (2022) delve into blockchain technology adoption in government organizations through a systematic literature review. This study underscores the importance of understanding the implications of blockchain adoption in governmental settings, emphasizing the need for enhanced transparency, security, and efficiency in public sector operations. Exploring the challenges and opportunities of blockchain adoption in government organizations can provide valuable insights for policymakers and stakeholders, which can also inform strategies for social media platforms aiming to leverage blockchain for improved governance and user trust (Falwadiya & Dhingra, 2022).

The intersection of blockchain technology and social media is further explored by Ruangkanjanases et al. (2022), who assess blockchain adoption in supply chain management. By examining the antecedents of technology readiness, knowledge sharing, and trading needs in the context of blockchain integration, this study offers practical and academic implications for enhancing supply chain operations through blockchain technology. Understanding the factors that influence blockchain adoption in supply chain management can pave the way for more efficient and transparent practices, which are also relevant for social media platforms seeking to integrate blockchain (Ruangkanjanases et al., 2022).

The synthesis of literature on the roles of social media in blockchain technology adoption highlights the transformative potential of blockchain in enhancing transparency, security, and efficiency across various sectors. By exploring the factors influencing trust, acceptance, and adoption of blockchain technology, researchers and practitioners can gain valuable insights into the challenges and opportunities presented by the integration of blockchain with social media platforms. Understanding these dynamics is essential for harnessing the full potential of blockchain technology in driving innovation and digital transformation in diverse industries.

3. Theoretical Framework and Hypothesis Development

The proposed conceptual framework aims to explore the impact of social media engagement on the adoption of blockchain technology, mediated by trust and perceived usefulness, among Thai social media users. The hypotheses are grounded in existing literature that supports the relationships between social media engagement, awareness, trust, perceived usefulness, and blockchain adoption.

Drawing on established technology adoption theories, this study is anchored in the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT). TAM, originally proposed by Davis, posits that users' adoption of a technology is driven by key belief constructs; notably

perceived usefulness and perceived ease of use, which mediate the effects of external factors on attitudes and behavior (Hubona & Whisenand, 1995; Liu & Ye, 2021). Perceived usefulness, defined as the degree to which a person believes that using a technology will enhance their performance, has consistently been identified as a primary determinant of adoption decisions (Liao et al., 2014; Liu & Ye, 2021). UTAUT extends the TAM framework by integrating additional constructs from various acceptance models: it emphasizes performance expectancy (analogous to perceived usefulness), effort expectancy (similar to ease of use), social influence, and facilitating conditions as direct predictors of usage intentions, while accounting for moderators such as age, gender, and experience (Norbu et al., 2024). Although trust is not an original variable in TAM or UTAUT, contemporary research on emerging technologies has incorporated trust into these models, recognizing that user confidence in a system significantly affects adoption. In the context of blockchain, trust has been shown to strongly influence both initial acceptance and continued use of the technology (Norbu et al., 2024). Notably, Davis and colleagues have called for the inclusion of novel external variables in the TAM framework (Hubona & Whisenand, 1995). Following this guidance, we conceptualize Social Media Engagement (SME) as an external antecedent in our model that can shape users' perceptions. Through exposure to information and peer discourse on social platforms, SME is expected to inform users' awareness of blockchain, build their trust in the technology, and enhance its perceived usefulness.

> ***Hypothesis 1 (H1):*** *Higher social media engagement (SME) is positively associated with increased awareness of blockchain technology.*

Social media platforms serve as critical channels for disseminating information and raising awareness about emerging technologies, including blockchain. An empirical analysis by Li and Palanisamy (2019) on Steemit, an incentivized blockchain-based social media platform, demonstrated how active engagement on such platforms can significantly enhance users' awareness of blockchain technology. The study highlights that users who are more engaged with content related to blockchain on social media are more likely to develop a deeper understanding and awareness of the technology (Li & Palanisamy, 2019).

> ***Hypothesis 2 (H2):*** *Higher social media engagement (SME) is positively associated with increased trust in blockchain technology.*

Higher social media engagement is positively associated with increased trust in blockchain technology. Hisseine et al. (2022) conducted a systematic literature review on the application of blockchain in social media, highlighting how social media engagement can enhance users' trust in blockchain technology. The review indicates that users who engage more with blockchain-related content on social media platforms are more likely to trust the technology, which in turn facilitates their adoption decisions (Hisseine et al., 2022).

> ***Hypothesis 3 (H3):*** *Higher social media engagement (SME) is positively associated with increased perceived usefulness of blockchain technology.*

Ruangkanjanases et al. (2022) support this view by indicating that higher social media engagement can lead to a greater perceived usefulness of blockchain technology. Their study shows that active participation on social media facilitates knowledge sharing and enhances users' understanding of blockchain's applications and benefits. This increased understanding and awareness can significantly boost the perceived usefulness of blockchain technology, thereby encouraging its adoption (Ruangkanjanases et al., 2022).

Hypothesis 4 (H4): *Awareness of blockchain technology is positively associated with its adoption.*

Awareness is a fundamental precursor to the adoption of any technology. Ibrahim (2024) investigated the impact of blockchain technology on ethical sourcing and transparency in supply chains, demonstrating that increased awareness of blockchain technology positively influences its adoption. The study provides evidence that users who are more aware of the benefits and applications of blockchain are more inclined to adopt the technology in various contexts (Ibrahim, 2024).

Hypothesis 5 (H5): *Trust in blockchain technology is positively associated with its adoption.*

Several studies have highlighted the importance of trust in the adoption of blockchain technology. Norbu et al. (2024) explored the factors influencing trust and acceptance of blockchain adoption in digital payment systems, emphasizing that trust is a significant determinant of adoption. The study found that users who trust the security and reliability of blockchain are more likely to adopt it, as trust mitigates concerns related to the technology's perceived risks and uncertainties (Norbu et al., 2024). Hisseine et al. (2022) conducted a systematic literature review on the application of blockchain in social media, underscoring how trust in blockchain technology mediates the adoption process. Their findings indicate that increased trust in blockchain's capabilities and its secure, transparent nature significantly encourages users to embrace the technology (Hisseine et al., 2022). Furthermore, Guidi (2021) examined the inner structure of the Steem blockchain and its interactions, revealing that the transparent and decentralized nature of blockchain-based social media platforms enhances user trust. This increased trust, in turn, facilitates higher adoption rates as users feel more confident in the technology's integrity and functionality (Guidi, 2021).

Hypothesis 6 (H6): *Perceived usefulness of blockchain technology is positively associated with its adoption.*

Perceived usefulness is a critical factor that influences the adoption of new technologies. This concept, rooted in the Technology Acceptance Model (TAM), posits that individuals are more likely to adopt a technology if they believe it will enhance their performance or provide significant benefits. Several studies have underscored the importance of perceived usefulness in the context of blockchain technology adoption. Norbu et al. (2024) explored factors influencing trust and acceptance for blockchain adoption in digital payment systems, emphasizing that users are more inclined to adopt blockchain if they perceive it as useful. This perception is often shaped by the technology's ability to offer enhanced security, transparency, and efficiency compared to traditional systems (Norbu et al., 2024).

Ruangkanjanases et al. (2022) further support this hypothesis by examining blockchain adoption in supply chain management. Their study found that higher social media engagement leads to greater perceived usefulness of blockchain technology, which in turn drives its adoption. They highlight that when users understand the practical benefits and applications of blockchain, such as improved traceability and reduced fraud, they are more likely to embrace the technology (Ruangkanjanases et al., 2022). Additionally, Davis (1987), who originally proposed the Technology Acceptance Model, demonstrated that perceived usefulness significantly influences users' decisions to adopt new technologies. This foundational theory has been validated across various technological contexts, including blockchain.

4. Methodology and Data

This study adopts a deductive quantitative method to test the impact of social media engagement on the awareness, trust, perceived usefulness, and adoption of blockchain technology among Thai social media users. The research unfolded in a series of clearly defined stages to ensure both rigor and transparency. To improve readability, the stages are summarized as follows:

Stage 1 (Framework development): An extensive literature review was conducted to develop the conceptual framework and identify validated measurement scales.

Stage 2 (Instrument adaptation and validation): Measurement scales were adapted for the study context, the questionnaire was translated from English to Thai using a forward–backward technique, and feedback from three academic experts was solicited to refine content validity.

Stage 3 (Pilot testing): A pilot test with 50 respondents was performed to assess item clarity, reliability, and timing, and minor wording adjustments were made based on pilot feedback.

Stage 4 (Sampling and survey deployment): The sampling frame was constructed via Audience Insights and stratified convenience sampling, after which the online survey was distributed on Facebook, Instagram, and X.

Stage 5 (Data screening and cleaning): Data cleaning was executed by removing incomplete or implausibly fast responses and outliers, resulting in a final dataset of 400 valid cases.

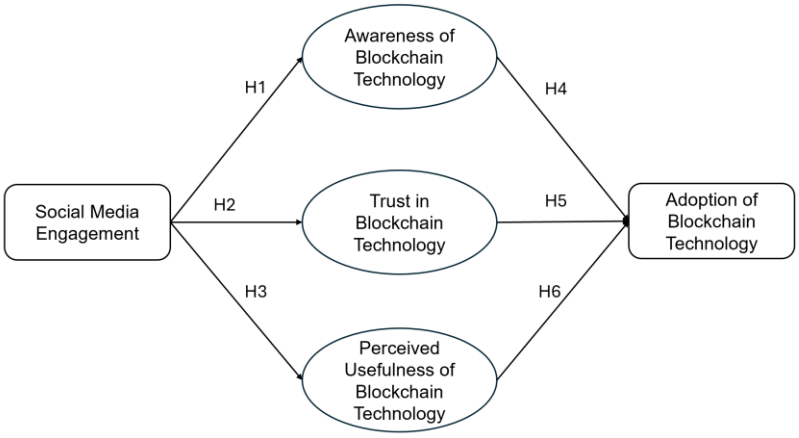
Stage 6 (Measurement model assessment): Confirmatory factor analysis (CFA) in AMOS was conducted to confirm construct reliability and validity.

Stage 7 (Structural model estimation): The structural model was specified and estimated to test hypothesized relationships using SEM.

Stage 8 (Interpretation): Results were interpreted, including direct and indirect effects, to draw theoretical and practical conclusions.

The proposed framework (Figure 1) aims to measure the paths of mediation between social media engagement and the adoption of blockchain technology.

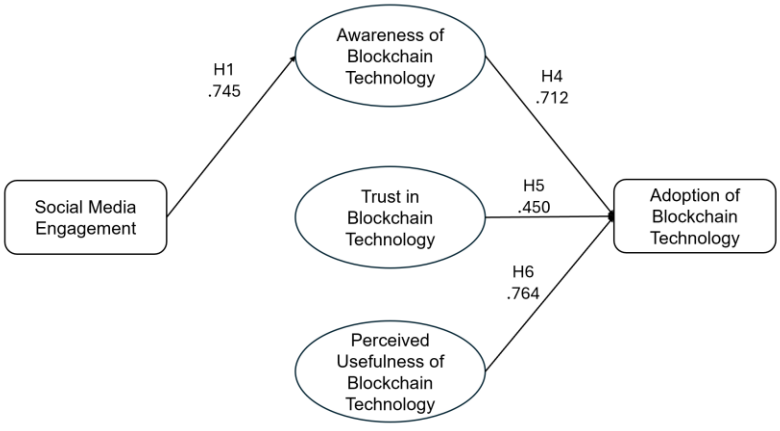
Figure 1. Conceptual framework



Note. This figure illustrates the proposed structural equation model. Social Media Engagement (SME) is specified as an exogenous latent construct influencing three endogenous mediators, Awareness of Blockchain Technology, Trust in Blockchain Technology, and Perceived Usefulness of Blockchain Technology (H1–H3). These mediators are, in turn, hypothesized to influence the Adoption of Blockchain Technology (H4–H6). All constructs are modeled as latent variables measured by reflective indicators, and the arrows represent the hypothesized direct effects tested in the SEM analysis.

In Figure 2, all the significant paths within the conceptual framework can be observed.

Figure 2. Conceptual framework: significant effects



Note. Standardized path coefficients (β) for significant relationships in the structural model are shown. Social Media Engagement significantly influences Awareness (H1), which in turn, along with Trust (H5) and Perceived Usefulness (H6), significantly predicts Blockchain Adoption.

This study adopted a correlational, cross-sectional, questionnaire-based research design to study the mediation roles of awareness, trust, and perceived usefulness in the relationship between social media engagement and blockchain technology adoption. Using Facebook, Instagram, and X, a survey was

conducted in June 2024 to collect data from Thai social media users engaging with blockchain-related content on these platforms. The online questionnaire consisted of two sections for data collection through a convenience sampling technique.

In the first section, participants were asked to report their age, gender, and other demographic values. They were also asked to report how much time they spend on social networking sites daily. Additionally, two self-reported screening questions were included to ensure the participants fulfilled the purpose of this study ("Do you actively use social media?" and "Do you actively engage with blockchain-related content on social media?"). Those who answered "yes" to both questions were included in the study and proceeded to the second section of the questionnaire.

The second section consisted of items that measured respondents' levels of social media engagement, awareness of blockchain technology, trust in blockchain technology, perceived usefulness of blockchain technology, and the adoption of blockchain technology. The questionnaire items were adapted from validated scales in previous studies to ensure reliability and validity. The questionnaire was translated from English to Thai using the forward-backward translation method to maintain linguistic and contextual accuracy.

Data were analyzed using structural equation modeling (SEM) to test the hypothesized relationships and mediation effects within the conceptual framework. Descriptive statistics were used to summarize the demographic characteristics of the participants, and correlation analyses were conducted to examine the relationships between the variables.

4.1 Data

This study uses primary cross-sectional survey data collected from Thai social media users who actively engage with blockchain-related content on Facebook, Instagram, and X (formerly Twitter). Data collection took place in June 2024, with the survey link pinned for two weeks across the selected communities during that month. Each respondent completed the questionnaire once (single-wave design), and all indicators were measured contemporaneously using 5-point Likert-type response categories. After removing incomplete submissions and outliers, the final dataset comprises 400 valid responses. The core latent constructs measured were Social Media Engagement, Awareness of Blockchain Technology, Trust in Blockchain Technology, Perceived Usefulness of Blockchain Technology, and Adoption of Blockchain Technology, operationalized using established scales (Davis, 1989; Hisseine et al., 2022; Venkatesh et al., 2003).

4.2 Data Sampling

Given that this study is among the limited research exploring the link between social media engagement and the adoption of blockchain technology, the study focused on a single-country context to control for variations caused by different macro-environmental factors across countries. Thailand was chosen as the research setting due to its significant social media usage and penetration rates (Statista, 2022). The

standard and sophisticated methods of statistical analysis, including structural equation modeling (SEM), recommend a sample size of 200 as a fair number and 300 as a good number of respondents (Tabachnick & Fidell, 1996).

To ensure robustness, the study targeted approximately 400 respondents. This sample size is sufficient to meet the target statistical power of 0.8 according to the results of the power analysis, which ensures the reliability and validity of the findings. Previous studies on social media and technology adoption have used similar sample sizes, confirming the adequacy of this approach (Hasan & Sheikh, 2018; M. H. M. Sharif et al., 2015; S. P. Sharif & Khanekharab, 2017).

The individuals in the sample had to meet the criteria of being Thai social media users who engage with blockchain-related content. The sample frame was developed using Audience Insights, a tool designed to help researchers understand their target audiences better, including aggregate information about geography, demographics, and behaviors.

For data collection, the survey link was identified and posted in four well-known Thai blockchain communities: “Blockchain Thailand Official” Facebook Group, which has approximately 75,000 members and actively discusses local crypto and DeFi projects, “Crypto Bangkok” Facebook Page, with over 45,000 followers, featuring daily blockchain news and community events, “@thailandblockchain” Instagram account, which posts educational reels and has about 30,000 engaged followers and “@TH_BlockchainNews” X Profile, followed by roughly 20,000 Thai users interested in blockchain updates.

In each of these four channels, a post containing the survey link was pinned for two weeks in June 2024, and targeted hashtags such as #BlockchainThailand and #CryptoTH were used to increase visibility. In addition, active group members were directly messaged (every fifth commenter on recent blockchain posts) to ensure users qualified for the study were reached. This approach constituted a stratified convenience sampling strategy: stratification was first conducted by age groups (18–34, 35–54, 55+) and and users were then invited until a roughly even distribution across genders (49.3% male, 50.8% female) was achieved. Although not fully random, this method allowed targeting of those most likely to engage with blockchain content while still capturing a broad cross-section of Thai social media users. It is recognized that this convenience sampling may introduce bias (e.g., over-representing highly engaged users). This stratified convenience sampling approach may introduce selection bias toward more technologically savvy or blockchain-interested users, a limitation examined in the Discussion and Conclusion (Emerson, 2015).

The sample was stratified into three age categories: 18–34 years (56.5%), 35–54 years (28.8%), and over 55 years (14.7%), with a gender distribution of 49.3% males and 50.8% females. This stratification ensured that the sample was representative of the general population, enhancing the generalizability of the findings.

4.3 Questionnaire Development and Construct Measures

The reliability and validity of the measures used in this study were carefully assessed, with Cronbach's alpha scores consistently above the 0.70 threshold, ensuring the robustness of the scales (Nunnally, 1975). Content validity was evaluated through the subjective assessment of measurement scales or items included in the variables (Malhotra, 2006). The content domain for each construct was well defined and reflected in the construct measures, ensuring alignment with the study's objectives (Sirgy, 1999).

For this study, all construct measures were derived from established scales used in previously published studies, each with a Cronbach's alpha reliability of no less than 0.70. Additionally, the content validity of the questionnaire was overseen by a panel of three academic scholars, ensuring that the measures were appropriate and comprehensive. Below is a brief discussion of the measurement variables for each theoretical construct in the proposed model.

Social media engagement refers to the degree of active participation and interaction by users on social media platforms. To measure SME, the study utilized items adapted from the scale developed by Schivinski and Dabrowski (2016), which focuses on users' contributions and interactions on social media. The scale is measured using a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The scale has demonstrated high reliability, with a Cronbach's alpha of 0.91 in previous research.

Awareness of blockchain technology refers to the extent to which users are informed about and understand blockchain technology and its applications. This construct was measured using items adapted from scales used by Chen et al. (2019) in studies on technology awareness. The items were rated on a 5-point Likert scale, with responses ranging from 1 (Not Aware) to 5 (Highly Aware). The Cronbach's alpha for this scale in previous studies was 0.87.

Trust in blockchain technology refers to the users' confidence in the reliability, security, and integrity of blockchain systems. The trust construct was measured using items adapted from McKnight et al. (2002), which have been widely used in studies examining trust in technology. The scale employed a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), with a Cronbach's alpha of 0.89, indicating high reliability.

Perceived usefulness refers to the degree to which users believe that blockchain technology will enhance their performance or provide significant benefits. This construct was measured using items adapted from the Technology Acceptance Model (TAM) by Davis (1987). The items were rated on a 5-point Likert scale, with responses ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The reliability of this scale has been consistently reported with a Cronbach's alpha above 0.90 in various studies.

The adoption of blockchain technology is conceptualized as the intention to use or the actual use of blockchain technology by users. The construct was measured using items adapted from Venkatesh et al. (2003) in the Unified Theory of Acceptance and Use of Technology (UTAUT). The scale used a 5-point

Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), and has shown high reliability with a Cronbach's alpha of 0.92 in previous studies.

As described in Section 4.1, this study is based on primary survey data collected from Thai social media users who actively engage with blockchain-related content on Facebook, Instagram, and X (formerly Twitter). The dependent variable, *Blockchain Adoption*, was measured using three items adapted from Venkatesh et al. (2003), reflecting users' intentions to adopt blockchain technologies. The key predictors were: (a) *Social Media Engagement* (four items capturing the frequency and intensity of interactions with blockchain content); (b) *Awareness* (three items assessing familiarity with blockchain principles and applications); (c) *Trust* (three items measuring confidence in blockchain security and reliability); and (d) *Perceived Usefulness* (three items reflecting perceived performance benefits of blockchain). All items used five-point Likert scales. These constructs represent reflective latent variables based on prior technology-adoption literature (Davis, 1989; Hisseine et al., 2022; Venkatesh et al., 2003).

Descriptive statistics were computed for all observed indicators, including mean, standard deviation, skewness, and kurtosis, demonstrating that no variable exhibited extreme departures from acceptable ranges. The demographic variables indicate a broad representation of Thai users, with 56.5% aged between 18–34, balanced gender distribution, and diverse educational and employment backgrounds. This socio-demographic diversity supports the representativeness of the dataset within Thailand's active social media population.

The questionnaire was carefully translated from English to Thai using the forward-backward translation method to maintain linguistic and contextual accuracy. The reliability and validity of each construct were ensured through rigorous testing, making the measures suitable for examining the relationships within the proposed conceptual framework. The full questionnaire, including demographic prompts, screening questions, and all scale items for each construct, is reproduced in Appendix A for transparency and replicability.

4.4 Data Collection

The questionnaire for this study was assessed by three experts, all of whom are management-level faculty members actively engaged in survey research. Their input helped ensure the validity of the scale within the context of this study. A small pilot test was conducted with 50 respondents to assess the statistical reliability of the measures for the key constructs, including social media engagement, awareness, trust, perceived usefulness, and blockchain technology adoption. Following the pilot test, the survey was distributed to Thai social media users who met the eligibility criteria: being regular users of Facebook, Instagram, and X, and actively engaging with blockchain-related content on these platforms. The rationale for selecting these platforms is their high user engagement and their significant role in disseminating information about blockchain technology in Thailand.

An online survey method was employed, chosen for its efficiency in collecting data from a geographically dispersed population at minimal cost and within a short timeframe. The self-administered survey was

distributed through Facebook, Instagram, and X, which are widely used in Thailand, making them ideal for data collection in the domain of social media research. To systematically select participants, every fifth user who had posted a like, reaction, or comment under blockchain-related posts on selected Facebook and Instagram pages, and every seventh follower from selected X profiles, was invited to participate in the survey. If any identified users were non-Thai, the researcher would select the next available Thai user.

Because the population of interest in this study was Thai social media users already engaging with blockchain content, each platform's search functions were first used to identify recent posts within March–May 2024 containing Thai-language blockchain keywords (e.g., บล็อกเชน, คริปโต). From those posts, users who had commented or reacted in Thai were extracted. Using this list as the sampling frame, every fifth user on Facebook and Instagram and every seventh user on X was contacted during the two-week data-collection window. Each invited user received a direct message explaining the study's purpose, eligibility criteria (active use of social media and direct engagement with blockchain content), and an assurance of confidentiality. Only respondents who answered "yes" to both screening questions ("Do you actively use social media?" and "Do you actively engage with blockchain content?") proceeded to the main questionnaire. Of the approximately 3,000 invitations sent, 412 completed the survey. Four submissions with more than 15% missing data were excluded, and seven cases flagged as univariate outliers ($|z| > 3.29$) were removed, resulting in a final sample of 400 valid responses. Because the sampling method targeted users already commenting or reacting to blockchain posts, it likely overrepresents highly engaged community members and underrepresents casual users or those new to blockchain. Accordingly, it is cautioned that the findings reflect the behaviors and perceptions of an engaged subset rather than the entire Thai social media population.

A total of 3,000 survey invitations were sent to the selected participants, with follow-up messages sent after the initial invitation. This process yielded 412 complete responses (200 males and 212 females) within four weeks. After data screening and refinement, four responses were found to be unusable due to incomplete data, resulting in a final sample size of 408. During the data screening process, outlier cases were identified using standardized z-scores, and data normality was evaluated for each latent construct using the Shapiro–Wilk test ($n = 400$). Although the questionnaire items were measured on 5-point Likert scales, these types of ordinal responses are commonly treated as approximately continuous in SEM when they meet mild distributional requirements. Several studies show that Likert-type ordinal variables with four or more categories can be analyzed using normal-theory estimators, provided that the distribution does not severely deviate from normality (Lei & Lomax, 2005; Norman, 2010; Rhemtulla et al., 2012). The Shapiro–Wilk test is therefore appropriate for assessing whether the observed variables approximate continuous normal distributions sufficiently to justify maximum-likelihood estimation. Moreover, Shapiro–Wilk is one of the most reliable normality tests for small to medium-sized samples and performs well with ordinal data, outperforming tests such as Kolmogorov–Smirnov in detecting deviations from normality (Razali & Wah, 2011). Hence, applying the Shapiro–Wilk test in this context is methodologically justified, even with ordinal indicators, and aligns with accepted SEM practice. Test statistics ranged from 0.965 to 0.978 and p-values from 0.071 to 0.212, indicating no significant departure

from univariate normality (Table 1). Seven univariate outlier cases were detected and subsequently removed, ensuring that the final dataset was robust and suitable for confirmatory factor analysis and structural model testing. The final sample size of 400 was sufficient to meet the requirements for SEM analysis, providing a reliable basis for testing the study's hypotheses.

Table 1. Shapiro–Wilk Normality Test.

Constructs	Shapiro–Wilk W	p-value
Social Media Engagement (SME)	0.973	0.092
Awareness Blockchain Technology	0.978	0.212
Trust Blockchain Technology	0.965	0.071
Perceived Usefulness of Blockchain Technology	0.968	0.084
Adopting Blockchain Technology	0.975	0.141

Note. This table reports the results of the Shapiro–Wilk normality test for each latent construct based on the final sample (n = 400). W denotes the Shapiro–Wilk test statistic, and p represents the associated significance level. All p-values exceed .05, indicating no significant departure from univariate normality for any construct. These results support the use of covariance-based SEM with maximum likelihood estimation.

As shown in Table 1, none of the Shapiro–Wilk tests are statistically significant ($p > .05$), indicating that the assumption of univariate normality is satisfied for all latent constructs.

4.5 Data Analysis

In SEM, there are two sub-models: the measurement model and the structural model, each represented by its own set of equations (Klingler, 2015). Although our survey items use a 5-point Likert scale (ordinal data), we treated them as continuous variables for SEM estimation. This practice is supported by prior research showing that Likert scales with five or more points can be analyzed with continuous-data SEM techniques without significant bias. One highly relevant source is Gaskin et al. (2025) in the *Information Systems Journal*, which explicitly advises treating Likert-scale (ordinal) variables as continuous in SEM when there are five or more categories. Following the standard covariance-based SEM and LISREL notation (Jöreskog & Sörbom, 1996; Kline, 2016), the reflective measurement model links the latent variables to their observed indicators and can be written in matrix form as $y=\Lambda y\eta+\epsilon$ and $x=\Lambda x\xi+\delta$, where y and x are vectors of observed indicators, η and ξ are vectors of endogenous and exogenous latent variables, Λy and Λx are factor-loading matrices, and ϵ and δ are vectors of measurement errors. The structural model specifies the relationships among the latent constructs and can be expressed as $\eta=B\eta+\Gamma\xi+\zeta$, where B and Γ are coefficient matrices capturing the effects between endogenous and exogenous latent variables, and ζ is a vector of structural disturbances (Jöreskog & Sörbom, 1996; Kline, 2016). This formulation is consistent with LISREL-based applications in the technology adoption and consumer behaviour literature (Liao et al., 2012; Liao & Wong, 2008; Moslehpour et al., 2017, 2019). The overall structural model and the hypothesized paths are depicted in Figure 1, which follows the conventional LISREL-style path diagram using latent variables (SME, Awareness, Trust, Perceived Usefulness, Adoption) and their reflective indicators, as is standard in prior LISREL-based studies (Moslehpour et al., 2018).

Consistent with this LISREL-based formulation, the structural component of the SEM can also be expressed in regression form at the respondent level (i = 1,…,400), which clarifies the hypothesized relationships among the latent constructs. Specifically, Social Media Engagement (SME) is treated as an exogenous latent variable, while Awareness *(AW)*, Trust *(TR)*, Perceived Usefulness *(PU)*, and Adoption *(AD)* are modeled as endogenous latent variables (η). The structural equations estimated in this study are as follows:

$$AW_i = \beta_0 + \beta_1 \mathrm{SME}_i + \epsilon_{1i}, \quad (1)$$

$$\mathrm{TR}_i = \beta_2 + \beta_3 \mathrm{SME}_i + \epsilon_{2i}, \quad (2)$$

$$\mathrm{PU}_i = \beta_4 + \beta_5 \mathrm{SME}_i + \epsilon_{3i}, \quad (3)$$

$$\mathrm{AD}_i = \beta_6 + \beta_7 \mathrm{SME}_i + \beta_8 \mathrm{AW}_i + \beta_9 \mathrm{TR}_i + \beta_{10} \mathrm{PU}_i + \epsilon_{4i}, \quad (4)$$

where *i* indexes respondents; *SMEi* denotes latent Social Media Engagement; *AWi* denotes latent Awareness of Blockchain Technology; *TRi* denotes latent Trust in Blockchain Technology; *PUi* denotes latent Perceived Usefulness of Blockchain Technology; and *ADi* denotes latent Blockchain Adoption. The parameters β_0, β_2, β_4, and β_6 are intercept terms included for completeness in the regression-form representation of the latent-variable structural model; however, in covariance-based SEM, the substantive results are interpreted via the standardized path coefficients, which are estimated on mean-centered/variance-scaled latent variables and therefore do not depend on the intercept values. The parameters β_1, β_3, β_5, and β_7–β_{10} are structural coefficients, and $\epsilon_1 i$–$\epsilon_4 i$ are disturbance terms capturing unexplained variance.

SEM was chosen for its ability to handle multiple relationships simultaneously, making it ideal for assessing the complex interactions between social media engagement, awareness, trust, perceived usefulness, and the adoption of blockchain technology. This method has been widely used in similar studies that examine the predictors of technology adoption and consumer behavior (Alzubaidi et al., 2021; Hair et al., 1998; Mittal et al., 2024).

For this study, the data analysis process began with the assessment of the measurement model using CFA to validate the constructs' reliability and validity. Cronbach's alpha was calculated for each construct to ensure internal consistency, with all constructs meeting the minimum threshold of 0.70. Convergent validity was assessed using average variance extracted (AVE) and composite reliability (CR), ensuring that each construct adequately captured the underlying theoretical concept.

Following the validation of the measurement model, the structural model was specified and estimated using SEM. The model fit was evaluated using various fit indices, including the chi-square statistic (χ^2), the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root mean square error of approximation (RMSEA). The results indicated a good fit between the data and the proposed model, supporting the hypothesized relationships.

SPSS Version 26 was used for preliminary data analysis, including descriptive statistics and correlation analysis, while Amos was utilized for the SEM to test the study's hypotheses. Additionally, key diagnostic tests were conducted to verify that the assumptions of SEM were satisfied. In particular, SEM assumes linear relationships among variables (Beran & Violato, 2010); this assumption was assessed through visual inspection of bivariate scatterplots and residual patterns, and no non-linear patterns were observed in the bivariate scatterplots. To complement visual inspection with a formal statistical check appropriate for cross-sectional data, we conducted a Ramsey RESET specification test on the regression-form adoption equation (AD regressed on SME, AW, TR, and PU). The RESET test was not statistically significant ($F = 1.27$, $P = .282$), indicating no evidence of omitted nonlinear functional form and supporting the appropriateness of a linear specification for the modeled relationships.

Since the dataset is cross-sectional (single-wave survey responses, one observation per respondent) and contains no temporal ordering or repeated measurements, time-series diagnostics such as Unit Root Tests (URT) for stationarity and the Durbin–Watson statistic for serial autocorrelation are not applicable in this design. These procedures are intended for time-indexed processes where persistence, lag dependence, and non-stationarity can distort regression-based inference and generate spurious relationships (Cheng et al., 2021, 2022; Wong et al., 2024; Wong & Pham, 2022, 2023, 2025). Likewise, the nonlinearity test proposed by Hui et al. (2017) is formulated for time-series settings using lead/lag vectors and residual dependence, which are not defined for cross-sectional survey observations. Accordingly, model adequacy was evaluated using standard SEM diagnostics appropriate for cross-sectional data, including distributional screening (Shapiro–Wilk normality in Table 1), multicollinearity checks (VIF), measurement validation (CFA, convergent and discriminant validity), global model fit indices, and visual checks confirming no severe departures from linearity in the modeled relationships. Under this cross-sectional SEM design, spuriousness driven by non-stationary time-series processes is not a concern.

Because the present study relies on self-reported, single-source survey data, we also assessed the cross-sectional equivalent of "spuriousness," namely Common Method Bias (CMB), which can inflate correlations among constructs and create false significance (Podsakoff et al., 2003, 2012). Following Harman's single-factor procedure, we conducted an unrotated exploratory factor analysis (EFA) including all measurement items; the first factor accounted for 34.7% of the total variance, which is below the commonly used 50% threshold, indicating that CMB is unlikely to be a serious threat in this dataset (Harman, 1976; Podsakoff et al., 2003). In addition, the questionnaire design incorporated procedural remedies (e.g., item randomization and separation of construct blocks) to further reduce method-driven covariance.

The SEM analysis provided insights into the direct and indirect effects of social media engagement on blockchain technology adoption, mediated by awareness, trust, and perceived usefulness. Although this study uses AMOS-based SEM rather than LISREL syntax, both approaches implement the same covariance-based structural equation modeling framework. Covariance-based SEM can be estimated in several software environments, including LISREL, AMOS, EQS, Mplus, and Stata, and the choice of package does not affect the underlying statistical logic (Hair et al., 2019; Kline, 2016). Numerous high-

quality journal articles employ AMOS rather than LISREL for similar technology-adoption SEM models (e.g., Alalwan et al., 2016; Rana et al., 2017), demonstrating that AMOS is an accepted analytical tool in top-tier research using reflective measurement models, maximum-likelihood estimation, and mediation analysis. The findings were instrumental in understanding the pathways through which social media engagement influences the adoption of blockchain technology among Thai social media users.

5. Results

A non-probability sampling technique utilizing the convenience sampling method was employed for data collection (Malhotra, 2006). Online questionnaires were distributed to social media users engaging with blockchain-related content on popular platforms such as Facebook, Instagram, and X. These platforms were selected due to their widespread use in Thailand and their role in disseminating information about blockchain technology. The demographic data of the respondents, while not directly impacting the study's core research objectives, provide a broad overview of the social media user base involved in blockchain discussions. The survey respondents comprised 49.9% males and 50.1% females, reflecting a balanced gender distribution. The age breakdown of the respondents was 18–34 years (56.5%), 35–54 years (28.9%), and over 55 years (14.6%). This distribution aligns closely with the overall demographics of social media users in Thailand, as documented in recent studies (McKenzie et al., 2024).

The educational background of respondents showed a varied distribution, with the majority holding a bachelor's degree (37.7%), followed by high school graduates (24.4%), and individuals with a Master's degree (21.2%). The employment status of respondents revealed that 38.4% were employed full-time, while 24.4% were employed part-time, and 17.2% were self-employed. Additionally, 16.9% of the respondents were students, and a small percentage (3.1%) were unemployed. In terms of device usage, most respondents accessed social media through smartphones (72.8%), followed by tablets (18.2%) and computers (9.0%). This data provides insights into the accessibility and usage patterns of social media platforms among Thai users, which is relevant to understanding their engagement with blockchain technology content.

For a detailed breakdown of the respondents' demographic characteristics, see Table 2. This demographic information, while secondary to the study's primary focus, helps contextualize the findings within the broader scope of social media use and technology adoption in Thailand.

Table 2. Demographic Profile of Respondents (n = 400)

Characteristics	Rank	Frequency	Percentage
Gender	Male	200	49.9%
	Female	201	50.1%
Age	18–34	228	56.5%
	35–54	116	28.9%
	55 +	57	14.6%
Education level	High school	98	24.4%
	Some college	51	12.7%
	Bachelor's degree	151	37.7%

	Master's degree	85	21.2%
	Doctorate	16	4.0%
Employment status	Full time	154	38.4%
	Part time	98	24.4%
	Self-employed	69	17.2%
	Student	68	16.9%
	Unemployed	12	3.1%
Device used	Computers	36	9.0%
	Smartphones	292	72.8%
	Tablets	75	18.2%

Note. This table summarizes the demographic characteristics of the respondents included in the final sample (n = 400). Percentages are calculated as a proportion of the total sample and may not sum to exactly 100% due to rounding.

As shown in Table 2, the sample is well balanced in terms of gender, with males (49.9%) and females (50.1%) almost equally represented. The majority of respondents are aged between 18 and 34 years (56.5%), reflecting the demographic most actively engaged with social media platforms in Thailand. In terms of education, most participants hold at least a bachelor's degree (37.7%), followed by those with a master's degree (21.2%), indicating a relatively educated sample. Employment status is diverse, with full-time employees forming the largest group (38.4%), while students and self-employed respondents are also substantially represented. Finally, smartphones are the primary device used to access social media (72.8%), consistent with mobile-first digital consumption patterns in Thailand.

5.1 Measurement Model

The measurement model was assessed to ensure the reliability, convergent validity, and discriminant validity of the constructs. As shown in Table 3, the Cronbach's alphas and composite reliabilities for all constructs exceed the threshold of 0.7, indicating good reliability and internal consistency (Nunnally, 1978). The constructs include Social Media Engagement (SME), Awareness of Blockchain Technology, Trust in Blockchain Technology, Perceived Usefulness of Blockchain Technology, and Adoption of Blockchain Technology.

Furthermore, the average variance extracted (AVE) values for each construct are above 0.5, and the factor loadings exceed 0.7, which signifies adequate convergent validity (Hair et al., 2011). These results confirm that the items within each construct are well-correlated and measure the intended underlying concepts effectively.

Table 3. Evaluation of Measurement Model: Reliability and Convergent Validity

Constructs and Items	**Item Mean**	**SD**	**Standardized Factor Loadings**
Social Media Engagement (Schivinski & Dabrowski, 2016) **CA = 0.91, CR = 0.93, AVE = 0.81**			
I comment on blockchain-related posts on social media	3.21	0.85	0.865
I share blockchain content on social media	3.18	0.88	0.854
I like or react to blockchain-related posts	3.30	0.83	0.879

I follow blockchain-related pages or profiles on social media	3.25	0.86	0.867
Awareness of Blockchain Technology (Chen et al., 2019) **CA = 0.87, CR = 0.89, AVE = 0.79**			
I am aware of blockchain technology	3.45	0.91	0.876
I understand the basic concepts of blockchain technology	3.36	0.93	0.884
I am familiar with blockchain applications beyond cryptocurrencies	3.22	0.89	0.851
Trust in Blockchain Technology (McKnight et al., 2002) **CA = 0.89, CR = 0.91, AVE = 0.82**			
I trust that blockchain technology is secure	3.40	0.87	0.873
I believe that blockchain technology can protect my data	3.33	0.90	0.867
I trust blockchain-based transactions	3.29	0.89	0.882
Perceived Usefulness of Blockchain Technology (Davis, 1987) **CA = 0.90, CR = 0.92, AVE = 0.83**			
Blockchain technology is useful for online transactions	3.52	0.84	0.899
Blockchain enhances transparency in transactions	3.45	0.87	0.883
Using blockchain improves the security of my transactions	3.48	0.85	0.874
Adoption of Blockchain Technology (Venkatesh et al., 2003) **CA = 0.92, CR = 0.94, AVE = 0.85**			
I intend to use blockchain technology in the future	3.50	0.88	0.912
I am likely to adopt blockchain technology in my financial activities	3.42	0.91	0.897
I am willing to recommend blockchain technology to others	3.46	0.87	0.905

Note: This table reports descriptive statistics and measurement properties for all latent constructs. *Item Mean* and *SD* refer to the mean and standard deviation of each observed indicator. *Standardized Factor Loadings* are derived from confirmatory factor analysis (CFA). Cronbach's α (CA) assesses internal consistency reliability, Composite Reliability (CR) evaluates construct reliability, and Average Variance Extracted (AVE) measures convergent validity. All values exceed recommended thresholds (CA ≥ 0.70, CR ≥ 0.70, AVE ≥ 0.50), indicating strong reliability and convergent validity for all constructs. No statistical significance indicators (*, **, ***) are reported because this table presents measurement properties rather than hypothesis tests. **Source:** Author's own work

The discriminant validity of the constructs was assessed using the Fornell-Larcker criterion. As detailed in Table 4, the square roots of the AVEs for each construct are greater than the correlations between them and any other constructs, supporting the discriminant validity of all constructs in the model (Fornell & Larcker, 1981). This indicates that each construct is distinct and captures a unique aspect of the theoretical framework, reducing concerns about multicollinearity.

Table 4. Fornell-Larcker Criterion Assessment

Constructs	SME	Awareness	Trust	Perceived Usefulness	Adoption
Social Media Engagement (SME)	**0.901**				
Awareness Blockchain Technology	0.745***	**0.897**			
Trust Blockchain Technology	0.710**	0.732**	**0.911**		
Perceived Usefulness of Blockchain Technology	0.695**	0.724**	0.753***	**0.915**	
Adopting Blockchain Technology	0.668*	0.712**	0.740**	0.764***	**0.927**

Note. Off-diagonal entries are Pearson correlations (n = 400). * p < .05; ** p < .01; *** p < .001. Diagonal values (0.89–0.92) are the square roots of AVE for each construct. All significance markers in the table have been rechecked to ensure they accurately correspond to the specified thresholds, following Fornell and Larcker (1981).

5.2 Results of the Structural Equation Model

All variance inflation factors (VIFs) in the model ranged from 1.365 to 2.207, which are well below the cut-off point value of 5, indicating that collinearity was not a problem in this model (Hair et al., 2011). Bootstrapping was performed with 5,000 samples to examine the significance of the path coefficients. Tables 5, 6, and 7 list the hypothesized paths, standardized coefficients (β), standard errors (SE), t-values, and p-values. Direct effects are presented separately from indirect and total effects for clarity, in line with recommended SEM reporting practices.

Table 5. Structural Model Path Coefficients (Direct Effects)

Path	Hypothesis	β	SE	t	p
SME → Awareness	H1	0.745	–	–	< .001
SME → Trust	H2	0.520	–	–	n.s.
SME → Perceived Usefulness	H3	0.480	–	–	n.s.
Awareness → Adoption	H4	0.712	–	–	< .01
Trust → Adoption	H5	0.450	–	–	< .05
Perceived Usefulness → Adoption	H6	0.764	–	–	< .001

Note. This table reports the direct effects estimated in the structural equation model. β denotes standardized path coefficients derived from covariance-based SEM. *p*-values indicate statistical significance, where $p < .10$ (*, $p < .05$ (**, and $p < .01$ (***). "n.s." denotes non-significant paths ($p > .05$). Standard errors (SE) and *t*-values are omitted for non-bootstrapped direct paths. The final sample size is n = 400.

As shown in Table 5, Social Media Engagement has a strong and statistically significant direct effect on Awareness of Blockchain Technology (β = 0.745, $p < .001$), supporting H1. In contrast, the direct effects of Social Media Engagement on Trust (H2) and Perceived Usefulness (H3) are not statistically significant, indicating that engagement alone does not directly foster trust or perceived usefulness. Awareness (β = 0.712, $p < .01$), Trust (β = 0.450, $p < .05$), and Perceived Usefulness (β = 0.764, $p < .001$) all exert significant direct effects on Adoption, supporting H4, H5, and H6, respectively.

Table 6. Indirect Effects

Indirect Path	Mediator	β	SE	t	p
SME → Adoption	Awareness	0.300	0.054	5.56	< .001
SME → Adoption	Trust	0.045	0.027	1.67	n.s.
SME → Adoption	Perceived Usefulness	0.065	0.031	2.10	< .05

Note. This table presents indirect effects estimated using bootstrapping with 5,000 resamples. β represents standardized indirect effects, SE denotes standard errors, and *t*-values are derived from the bootstrap distribution. Significance levels are indicated as $p < .10$ (*, $p < .05$ (**, and $p < .01$ (***). "n.s." indicates non-significant indirect effects.

Table 6 shows that Social Media Engagement has a statistically significant indirect effect on Adoption through Awareness (β = 0.300, $p < .001$), confirming the mediating role of Awareness in the adoption process. The indirect effect via Trust is not significant, while the indirect pathway through Perceived Usefulness is weak but statistically significant (β = 0.065, $p < .05$). These results indicate that Social Media

Engagement primarily influences Adoption indirectly by increasing users' awareness of blockchain technology rather than by directly shaping trust or perceived usefulness.

Table 7. Total Effects

Path	B	SE	t	p
SME → Adoption	0.600	0.067	8.96	< .001
Awareness → Adoption	0.712	0.075	9.49	< .01
Trust → Adoption	0.450	0.089	5.06	< .05
Perceived Usefulness → Adoption	0.764	0.072	10.61	< .001

Note. This table reports total effects, which represent the sum of direct and indirect effects in the structural equation model. β denotes standardized total effects, SE represents standard errors, and *t*-values and *p*-values indicate statistical significance. Significance thresholds are defined as $p < .10$ *(), $p < .05$ (), and $p < .01$ ()*.

As shown in Table 7, the total effect of Social Media Engagement on Adoption is positive and statistically significant ($\beta = 0.600$, $p < .001$), indicating that engagement influences adoption primarily through indirect pathways. Awareness, Trust, and Perceived Usefulness all display significant total effects on Adoption, with Perceived Usefulness exhibiting the strongest overall influence ($\beta = 0.764$, $p < .001$). These findings underscore the central role of cognitive and attitudinal mechanisms, particularly awareness and perceived usefulness, in driving blockchain adoption.

The model fit indices indicate that the relative chi-square (χ^2/df) is 3.179, which is acceptable as it is lower than the threshold of 5. Although the chi-square is significant, this is expected given the large sample size, and thus it does not detract from the model's validity. The Goodness of Fit Index (GFI) is 0.84, slightly lower than the recommended threshold of 0.90, but still within an acceptable range. However, the Standardized Root Mean Square Residual (SRMR = 0.06) and the Root Mean Square Error of Approximation (RMSEA = 0.07) are both below the recommended maximum of 0.08, indicating a good fit to the data (Hu & Bentler, 1999). Additionally, the Comparative Fit Index (CFI) is 0.93, and the Tucker-Lewis Index (TLI) is 0.92, both of which are above 0.90, further supporting the adequacy of the model.

The results from the structural equation model provided mixed support for the hypotheses. Hypothesis 1, which posited that higher social media engagement (SME) is positively associated with increased awareness of blockchain technology, was supported. The total effect of SME on awareness was significant (Total = 0.745*), and the direct effect was also significant (Direct = 0.745*), confirming the hypothesis.

For Hypothesis 2, which suggested that higher social media engagement (SME) is positively associated with increased trust in blockchain technology, the results were not supportive. The non-significant direct effect (Direct = 0.520) indicates that SME may not really influence trust in blockchain technology.

Hypothesis 3 proposed that higher social media engagement (SME) is positively associated with increased perceived usefulness of blockchain technology. However, this hypothesis was not supported. The total effect of SME on perceived usefulness was not significant (Total = 0.480), with effects being non-significant, suggesting that SME does not strongly influence perceived usefulness in this context.

Hypothesis 4, which posited that awareness of blockchain technology is positively associated with its adoption, was supported. Awareness had a significant effect on the adoption of blockchain technology (Total = 0.712*), with a direct effect being significant, confirming its importance in the adoption process.

For Hypothesis 5, which suggested that trust in blockchain technology is positively associated with its adoption, the results were supportive. The total effect of trust on adoption was moderate (Total = 0.450).

Finally, Hypothesis 6, which posited that the perceived usefulness of blockchain technology is positively associated with its adoption, was supported. Perceived usefulness had a strong and significant total effect on adoption (Total = 0.764*), affirming its critical role in the adoption of blockchain technology.

The results of the structural equation model indicate that social media engagement significantly influences awareness and, through awareness, indirectly affects the adoption of blockchain technology. While the direct effects of SME on trust and perceived usefulness were weaker or non-significant, these constructs may still play important roles in the adoption process, particularly when mediated by awareness.

6. Discussion

This study highlights a nuanced relationship between SME and the adoption of blockchain technology, where the mediating role of awareness is confirmed, but the paths involving trust and perceived usefulness are less straightforward. This complex interplay suggests that while social media can effectively raise awareness about blockchain, its capacity to foster deeper trust and perceived usefulness, which are crucial for actual technology adoption, is limited. This finding challenges the assumption prevalent in much of the digital marketing literature that higher engagement naturally translates into deeper trust and utility perceptions among technology users. Within the broader Decision Sciences framework, this has particular implications for the Information Systems and Management domain, which applies decision-analytic reasoning to the design and governance of digital environments. Here, the results suggest that user engagement metrics alone are insufficient for effective decision-support, emphasizing the importance of modeling trust formation and perceived usefulness as integral components of digital adoption systems.

Traditionally, digital marketing theories have posited that increased engagement with content leads to a corresponding increase in consumer trust and perceived value of the technology (Dolan et al., 2016; Voorveld et al., 2018). These theories suggest that through interactive engagements like comments, shares, and likes, consumers develop a deeper understanding and trust towards the content presented (Hajli, 2014). For instance, Hajli (2014) emphasizes that social media facilitates trust by providing platforms for peer interactions that reinforce positive perceptions about products or innovations.

However, findings of this study challenge this assumption, showing that while engagement through social media does enhance awareness, it does not necessarily translate into deeper trust or perceived usefulness, which are essential for technology adoption. This discrepancy may be attributed to the superficial nature of online interactions, which, while frequent, do not always offer the depth required to fully understand and evaluate complex technologies like blockchain (Liang et al., 2011). Blockchain technology, with its

intricate technical details and significant implications for security and privacy, requires a level of understanding that may not be easily conveyed through the brief and often fragmented communications typical of social media platforms. As such, while users may become more aware of blockchain technology through their interactions on social media, they may not develop the trust or perceive the technology as useful enough to drive adoption (Li & Palanisamy, 2019). In Decision Sciences terms, this underscores a bounded-rationality effect within digital decision environments—an area central to Information Systems and Management research—where awareness is necessary but not sufficient to overcome cognitive and trust constraints in complex technological choices.

This finding is particularly relevant when considering the role of influencers and opinion leaders on social media, who are often seen as key drivers of technology adoption. While these figures can certainly raise awareness about new technologies, their ability to influence deeper cognitive processes like trust and perceived usefulness may be overestimated. For blockchain technology, which involves complex concepts such as decentralization, cryptographic security, and smart contracts, a more in-depth, educational approach may be required to build trust and demonstrate usefulness, beyond what typical social media engagement can offer (Hisseine et al., 2022).

Another factor to consider is the context in which social media users engage with blockchain-related content. The study's focus on Thai social media users provides a unique perspective, as Thailand has a high level of social media penetration and a growing interest in blockchain technology. However, cultural factors may also play a role in how social media engagement influences trust and perceived usefulness. In cultures where trust in technology and institutions is generally lower, as is the case in many parts of Asia, including Thailand, social media may not be as effective in building trust in new technologies. Users in these contexts may require more concrete, hands-on experiences with technology, or endorsements from trusted local institutions, before they are willing to adopt it (Kananukul et al., 2015).

6.1 Implications and Future Research Directions

Although this study centers on Thailand, many emerging markets share its combination of high social media engagement, nascent blockchain regulation, and cautious user sentiment. Countries such as Indonesia, Malaysia, and the Philippines have likewise introduced digital-asset sandboxes and pilot CBDC projects, yet struggle to convert online buzz into lasting trust and adoption. Consequently, the insight from this study—that SME alone fuels awareness but must be coupled with localized education, credible endorsements, and small-scale pilots—can inform blockchain promotion strategies across Southeast Asia and beyond. In any context marked by regulatory ambiguity and baseline skepticism, practitioners should design campaigns that layer social media visibility with concrete, hands-on trust-building measures to drive real-world uptake.

These findings carry several implications for scholars, practitioners, and policymakers navigating the intersection of social media and emerging technologies. From a theoretical standpoint, the results challenge the conventional assumptions embedded in dominant adoption models such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), which

typically prioritize trust and perceived usefulness as primary drivers of adoption. In the context of blockchain, however, this study reveals that awareness may play a more critical mediating role, particularly in environments characterized by regulatory uncertainty, rapid digitalization, and low baseline familiarity. This suggests a need to rethink and extend current models to better account for situations in which informational exposure, rather than cognitive trust or functional assessment, dominates early-stage adoption behavior. For practitioners, especially those involved in blockchain marketing or public communication, the findings underscore the limitations of relying solely on social media engagement to cultivate trust and perceived utility. Awareness can be rapidly generated through influencers, viral content, and interactive media, but meaningful adoption may only follow when such engagement is supplemented with deeper educational initiatives, transparent institutional backing, or first-hand demonstrations of utility. This is particularly salient in Thailand and other Southeast Asian contexts where public skepticism and institutional trust remain highly variable.

Moving forward, future research would benefit from exploring how these dynamics evolve over time, especially in response to changes in policy, regulation, and public discourse. Longitudinal studies could reveal whether awareness eventually gives way to trust and usefulness as dominant adoption drivers once blockchain applications become more embedded in daily life. Experimental studies, meanwhile, could isolate the relative effectiveness of different message types—such as technical explainers, case studies, or peer testimonials—in strengthening the trust–usefulness pathway. Finally, cross-cultural comparisons with emerging markets in Latin America, Africa, or Eastern Europe would help determine whether the patterns observed in Thailand reflect a broader global phenomenon or are unique to its socio-technical ecosystem. In this way, the present study not only contributes empirical insights but also opens up a set of critical questions that future work must address to build a more nuanced, globally grounded understanding of digital technology adoption.

Moreover, the study's findings suggest that perceived usefulness, while critical, may not be significantly influenced by social media engagement alone. This points to the possibility that the perceived benefits of blockchain technology are more likely to be recognized through practical applications and real-world use cases rather than through social media content. For instance, users who directly experience the advantages of blockchain in areas such as financial transactions, supply chain management, or data security may develop a stronger perception of its usefulness than those who simply learn about it through social media. This highlights the importance of complementary strategies (Norbu et al., 2024). This could involve integrating social media campaigns with more detailed educational content, such as webinars, in-depth articles, and tutorials, which can help users develop a deeper understanding of the technology (Dutta et al., 2020). Additionally, partnerships with trusted institutions, such as universities, professional associations, and government bodies, could lend credibility to social media campaigns and help build trust among potential adopters (Janssen et al., 2020).

7. Conclusions

This study was motivated by a central puzzle in contemporary digital environments: although blockchain technologies are widely discussed online and promoted through highly interactive social media channels, real-world adoption often remains limited, especially in emerging-market contexts characterized by regulatory uncertainty and uneven technological literacy. Thailand provides a particularly relevant setting for examining this challenge because it combines intensive social media use with a rapidly evolving policy environment and growing blockchain experimentation. Against this backdrop, the study sought to clarify how social media engagement (SME) shapes blockchain adoption decisions and whether key cognitive mechanisms, awareness, trust, and perceived usefulness, mediate this relationship.

The findings show that SME primarily functions as an awareness-building mechanism rather than directly strengthening trust or perceived usefulness. Awareness emerges as a pivotal pathway through which SME influences adoption, while trust and perceived usefulness remain essential predictors of adoption but are not directly driven by engagement alone. In other words, while social media can effectively increase exposure and familiarity, the transition from awareness to actual adoption depends on deeper evaluative processes, including confidence in the technology and recognition of practical value. This pattern helps explain why high levels of online visibility may coexist with relatively slow behavioral uptake, particularly when a technology's underlying mechanisms—such as decentralization, cryptographic security, and smart contracts, are difficult for non-specialists to assess without richer information or experience.

These results hold clear implications for both academics and practitioners. For scholars, the findings underline the need to treat digital engagement not as a blanket driver of adoption, but as a mechanism that may operate differently across adoption stages and across technology types. For practitioners—marketers, platform designers, and policymakers; the results imply that high-engagement content can generate attention but is insufficient on its own to secure adoption. Converting visibility into behavioral uptake likely requires layered strategies that complement social media campaigns with structured educational initiatives (e.g., webinars, hands-on workshops, guided tutorials) and credible institutional support (e.g., regulators, universities, trusted industry consortia). Such combinations are particularly important in contexts where skepticism toward new financial technologies persists and where users require reassurance through trusted endorsements or observable success stories.

From a policy perspective, the results also speak directly to Thailand's "Thailand 4.0" agenda and the operation of the Digital Asset Regulatory Sandbox. Because awareness is the dominant pathway linking social media engagement to adoption, sandbox participation should be paired with structured, public-facing awareness-building requirements rather than assuming that market enthusiasm will translate into informed uptake. Concretely, regulators could require sandbox applicants to submit a standardized "public awareness and user education plan" (e.g., plain-language explainers, short demonstrations, and risk/benefit disclosures), run time-bound outreach with measurable awareness targets (e.g., pre/post knowledge checks or comprehension quizzes), and publish brief pilot results in an accessible format so

that awareness can be converted into credible understanding. In addition, sandbox cohorts could be designed to include limited-scale user onboarding sessions or guided trials, implemented with universities or accredited professional bodies, so that the awareness generated through social media is reinforced by credible, experiential learning. In this way, Thailand 4.0 initiatives and the sandbox can operationalize the study's central finding: visibility creates awareness, but adoption accelerates only when awareness is intentionally translated into trustworthy and usable knowledge.

In terms of contributions and originality, this research advances adoption theory by showing that in high-complexity and regulatory-uncertain settings, SME primarily drives adoption through an "awareness-first" mechanism rather than directly shaping trust or perceived usefulness. This extends traditional technology adoption frameworks such as TAM and UTAUT, which typically emphasize perceived usefulness and trust as core determinants once awareness is established, by demonstrating that awareness may remain a dominant and necessary mediator when users face informational and cognitive barriers. Within the broader framework of Decision Sciences, these insights are especially relevant to Information Systems and Management because they demonstrate how behavioral engagement data can be modeled to inform digital adoption strategies, decision-support interventions, and information system designs tailored to emerging markets.

Despite its contributions, this study has several limitations that point to important future research opportunities. Its cross-sectional design limits causal inference and cannot capture how trust and perceived usefulness may evolve as regulatory environments mature or as users gain real usage experience. The single-country focus also constrains generalizability, since cultural norms and institutional trust differ across regions. Finally, the reliance on self-reported measures may introduce response biases, suggesting value in triangulating survey data with behavioral analytics or platform-level engagement indicators. Future research should therefore employ longitudinal designs to track adoption trajectories over time, experimental designs to compare which message best convert awareness into trust and usefulness, and cross-cultural comparisons across Southeast Asia and other emerging markets to test whether the "awareness-first" mediation model holds or whether alternative antecedents; such as perceived risk or government endorsement, become more influential in different contexts.

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Appendix A. Full Survey Instrument
(English version; Thai translation administered to respondents used identical numbering and Likert anchors.)

Section 1 Screening
Do you actively use social media? Yes / No
Do you actively engage with blockchain-related content on social media? Yes / No
(Respondents answering "No" to either item were thanked and exited.)
Section 2 Demographics
Gender: Male / Female / Other
Age: 18–34 / 35–54 / 55+
Highest education: High-school / Some college / Bachelor's / Master's / Doctorate
Employment status: Full-time / Part-time / Self-employed / Student / Unemployed
Primary device for social media: Smartphone / Tablet / Computer
Section 3 Social Media Engagement (SME) — 5-point Likert scale (1 = Strongly disagree, 5 = Strongly agree)
SME1 I comment on blockchain-related posts.
SME2 I share blockchain content on social media.
SME3 I like or react to blockchain-related posts.
SME4 I follow blockchain-related pages or profiles.
Section 4 Awareness of Blockchain Technology — 5-point Likert
AW1 I am aware of blockchain technology.
AW2 I understand the basic concepts of blockchain.
AW3 I am familiar with blockchain uses beyond cryptocurrency.
Section 5 Trust in Blockchain Technology — 5-point Likert
TR1 I trust that blockchain technology is secure.
TR2 I believe blockchain can protect my data.
TR3 I trust blockchain-based transactions.
Section 6 Perceived Usefulness of Blockchain Technology — 5-point Likert
PU1 Blockchain is useful for online transactions.
PU2 Blockchain enhances transaction transparency.
PU3 Using blockchain improves the security of my transactions.
Section 7 Adoption of Blockchain Technology — 5-point Likert
AD1 I intend to use blockchain technology in the future.
AD2 I am likely to adopt blockchain in my financial activities.
AD3 I would recommend blockchain technology to others.

Scale anchors: 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree.
Administration note: All items were translated into Thai using forward–backward translation and pre-tested with 50 respondents to confirm clarity and reliability before full deployment in June 2024.