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Adoption of blockchain as an open accounting information system in Vietnam: A triple-entry accounting approach

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ABSTRACT

Blockchain technology has emerged as an indispensable force driving economic development across various sectors in Vietnam. However, prior research in the realm of blockchain technology has predominantly focused on areas such as logistics, journalism, and banking, neglecting the pivotal domains of accounting and auditing. Recognizing this theoretical gap and the significant role played by accounting and auditing in economic systems, this paper endeavors to augment our understanding of blockchain technology through the lens of a novel "triple-entry accounting method." Additionally, it seeks to assess the level of acceptance of this potentially transformative innovation within the Vietnamese business landscape. Blockchain, renowned for its decentralized architecture and distributed data system, represents a fundamental departure from conventional accounting practices. It functions as an open accounting information system, wherein data is distributed among multiple computers with identical copies, devoid of central administration but validated by a network of participants. Drawing upon responses from a sample of 225 participants and employing statistical analysis with SPSS, this study investigates attitudes and intentions regarding the adoption of blockchain technology in the field of accounting in Vietnam. The results of this analysis reveal a positive correlation between four variables-perceived usefulness, perceived ease of use, comparability, and complexity-and the attitude toward blockchain application, further positively influencing the intention to use it. However, the variable of Perceived Risk does not exhibit statistical significance. These findings underscore the necessity of establishing intelligent accounting procedures through blockchain adoption and underscore the importance of understanding factors influencing attitudes and intentions to enhance the widespread acceptance of this innovation in the Vietnamese business context.

1. Introduction

In the context of the contemporary globalized economy, characterized by the advent of the Fourth Industrial Revolution, blockchain technology stands as a paramount force with the potential to profoundly reshape our daily lives and the fundamental paradigms of conducting business. This dynamic technology not only offers a formidable defense against cyber threats but also presents a unique capacity to augment transparency across various facets of business operations, particularly in the digital age. In the realm of technological applications within the business sphere, alongside conventional computer-based devices, a myriad of novel terminologies has gained prominence, including cryptocurrencies, digital-distributed ledgers, blockchain, and triple-entry accounting (Han et al., 2023). The genesis of blockchain technology can be traced back to its initial application in the financial sector, notably in the functioning of Bitcoin. Traditionally, during electronic payment transactions, the presence of an intermediary entity, typically a financial institution, has been indispensable for overseeing the transfer of funds. These intermediaries perform the crucial role of vigilant overseers, albeit at a significant cost. Conversely, blockchain technology offers an innovative alternative by obviating the need for a third-party intermediary, thereby facilitating

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transactions that are inherently more secure and reliable. This is achieved through a network of interconnected chains and information blocks that grant all involved parties the ability to independently verify and control transaction information (Alamsyah and Syahrir, 2023).

Crucially, blockchain technology heralds a transformative shift in data management practices. In the traditional paradigm, data is centralized, with access restricted to designated authorities who maintain and update ledgers with each alteration. Reconciling data between transaction participants is a laborious and costly endeavor, as each party maintains control over its own isolated system. In stark contrast, blockchain technology provides a dynamic and continuously updated ledger that is accessible to all participants in real time. This ensures that all stakeholders possess an identical, synchronized copy of the ledger, ushering in a new era of data management and integrity (Dai and Vasarhelyi, 2017).

In accounting, blockchain can be simply defined as a distributed ledger, where transactions are verified, securely stored on a digital network, connected, and managed by related parties. In traditional accounting, the cost of public reliance on the quality of financial information is high when investors need to rely too much on trust in the integrity, the judgments of accountants and auditors; and the cost of losses from consequences of financial frauds or high-profile scandals such as Enron. By using Blockchain in accounting, under this platform, information users wouldn't need to rely upon others' subjective opinions because it eliminates the role of the intermediaries by providing receipts that are cryptographically sealed.

Recently, high-profile cases of financial scandals such as Enron, and WorldCom have been put as huge concerns in the perspectives of information users about the reliability of financial information. Thus, to reduce suspicion and improve the reliability for protecting investors, blockchain is considered a potential technology to enhance the trust between parties, it can be used for fraud or error detection and make the world more transparent while executing financial data.

The application of blockchain technology is an unavoidable trend in business management, and accounting and auditing are the main areas of interest (Pimentel and Boulianne, 2020). Blockchain in Vietnam is still immature, thus in this research, we explore the attitude and how the accounting profession/managers respond to blockchain technology–a potential tool that challenges the future of accounting and auditing. The technology acceptance model and innovation diffusion theory are theoretical backgrounds for proposing and testing the research framework.

1.1. Innovation diffusion theory

Innovation diffusion theory (IDT) is one of the most powerful models involving technological innovation and seeks to explain the process of adoption when a new idea or new innovativeness is launched (Rogers, 1995).

Rogers (1995) described the innovation adoption process regarding types of innovation adopters. For every innovation or technology, while considering costs and promising benefits, some are willing to be early adopters, and some wait until the clear effectiveness is confirmed. Thus, the goal of any business is to enhance effective adoption and implementation by transferring non-adopters to adopters, and non-users to users. This idea is central to IDT theory (Rogers, 1995), with the statement that innovations are not adopted by everyone in alignment. In the theory, the five categories of adopters consisted of (a) innovators (2.5%), (b) early adopters (13.5%), (c) the middle majority (34%), (d) late majority (34%), and (e) laggards (16%). Rogers (1995) also provided a model with five characteristics of innovation: (a) relative advantage, (b) compatibility, (c) complexity, (d) trialability, and (e) observability.

The pervasiveness of IDT also can be found in blockchain accounting research (Clohessy et al., 2020) or blockchain in supply chain management (Choi et al., 2020; Zhou et al., 2022; Mukherjee et al., 2023), technology innovativeness (Wu and Wang, 2005; Al-Rahmi et al., 2019).

Relevant to the innovation adoption/diffusion theory, the implication of the innovation in this study should be a triple-entry accounting blockchain. In the accounting field, a modern technology like blockchain attracts pioneers due to its potential benefits (working faster, and reliability), then another group closely follows, and the remaining normally lags behind because they will wait until the technology is firmly established. In fact, as for Pimentel and Boulianne (2020), the blockchain's early adopters come from big names such as some main professional accounting bodies recognized at the international level (CPA Canada, AICPA, CAANZ, ACCA, ICAEW, and Big 4 audit firms, PwC, Deloitte, KPMG, and EY). The five innovation characteristics (Rogers, 1995) are discussed in detail as follows:

- Relative advantage: The degree to which an innovation is perceived as a better version than its older traditional one. This relative advantage can be conceptualized as ease of use.
- Compatibility: The level to which an innovation is perceived as being compatible with the existing values, needs, and past experiences of potential adopters." In comparison with traditional accounting, this attribute refers to the participants' perspectives on the benefits they can get while using blockchain.
- Complexity: Is defined as the level of difficulty in understanding innovations. In this case, it refers to the extent of difficulty of blockchain technology viewed by participants. This construct is parallel with perceived ease of use in the TAM model.
- Trialability: Refers to the extent to which an innovation may be experimented with on a limited

basis. Before deciding to adopt, participants need to have some experience in blockchain technology. In the trial stage, potential adopters may evaluate for innovation modification, which is helpful for later adopters.
- Observability: The degree to which the results of an innovation are visible to others.

Because blockchain is now still an emerging technology, measuring the perceptions of blockchain acceptance in accounting and auditing in Vietnam should be an interesting topic, and increasing the adoption rate of adoption is the goal of any innovativeness, not only blockchain technology.

1.2. Technology acceptance model

The Technology Acceptance Model (TAM) has been one of the most popular models of the information systems research stream. In technology applications, TAM is a powerful model to understand the motivation as well as the success of a newly introduced technology, it provides an explanation for users' acceptance of technology innovations.

Fig. 1 describes that when a new technology is presented to users, beliefs about usefulness and ease of use are essential variables in determining a user's attitude toward using that technology.

As defined in TAM, Perceived Usefulness is "the degree to which a person believes that a particular technology would enhance his or her job performance" (Davis, 1989) and Perceived Ease of Use is "the degree to which a person believes that the utilization of a particular technology would be free of effort" (Davis, 1989). In financial technology, TAM also contributes to investigating the attitude and intention to use blockchain in supply networks (Choi et al., 2020; Zhou et al., 2022), smart locker in logistics (Lian et al., 2020), or Bitcoin (Folkinshteyn and Lennon, 2016).

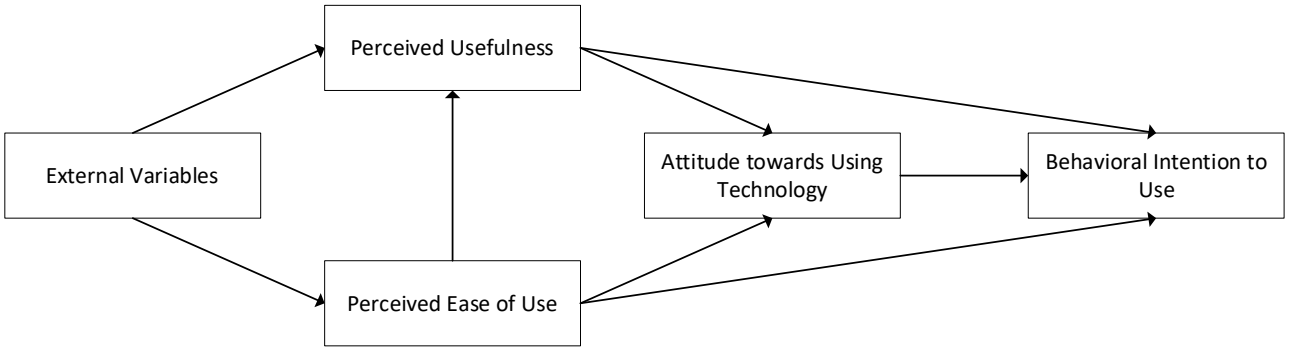

Fig. 1: Technology acceptance model (Davis, 1989; Davis et al., 1989)

IDT or TAM has been widely used, it may be applied separately or as a combined model: Crypto payments in hospitality using extended TAM only (Nuryyev et al., 2021), IDT in various fields such as finance, accounting (Yoo et al., 2020), railway industry (Preece and Easton, 2019). Combined TAM-IDT was used to test Internet-only bank adoption (Yoon and Lim, 2020), in E-learning (Al-Rahmi et al., 2019). Based on the combination of the two most important models for innovation technology launches (TAM and IDT), the theoretical background should become the firm foundation to investigate the perceptions of accounting professionals/managers in the context of blockchain as triple entry accounting.

Existing literature describes that "relative advantage and perceived usefulness," "Complexibility" and "perceived ease of use" are similar, relevant constructs in pairs while assessing innovation adoption (Wu and Wang, 2005; Al-Rahmi et al., 2019).

Triple-entry accounting, as manifested through blockchain technology's integration into the accounting domain, represents a significant evolutionary leap within the field. In the realm of accounting, traditionally, three distinct methodologies have been employed for recording financial transactions: single entry, the oldest but less reliable method; double entry, the well-established practice that involves recording transactions on both the debit and credit sides; and most notably, triple-entry accounting, a revolutionary innovation attributed to blockchain technology, marking one of the most pivotal advancements in the last five centuries.

Single-entry accounting, the earliest and simplest approach, entails the recording of a transaction with a sole entry, describing only one facet of the transaction. This method, though rudimentary, carries inherent drawbacks, including a heightened potential for errors, reduced trustworthiness, and the absence of a professional oversight requirement.

Conversely, double-entry accounting, originating in the 14th century with Luca Pacioli, the renowned figure regarded as the father of accounting, involves dual entries for each transaction—debit and credit—reflecting the dual impact of any financial item. Over time, the evolution of accounting practices has witnessed the fusion of traditional accounting and information technology, resulting in sophisticated and secure platforms with intricate database structures.

In the context of the Fourth Industrial Revolution, the integration of blockchain technology has ushered in a modern era of accounting information systems, characterized by the advent of the triple-entry

accounting approach. Triple-entry bookkeeping, as an innovative alternative, promises to streamline current labor-intensive and costly accounting practices, addressing issues such as losses due to accounting fraud and the substantial fees associated with external auditors tasked with verifying a company's financial data.

Ijiri (1986) originally introduced the term "Triple-entry bookkeeping," in addition to the debit and credit double-entry system, another layer called trebit for recording "momentum income" (income being earned). Before the Income statement, the Balance sheet is the only statement and transaction that has to be recorded at least twice, showing the changes in balance sheet structure, gain or loss was calculated by comparing the opening and closing equity. The double entry does not record how the net gain/loss occurred, it should have a triple layer for recording a new wealth was created and this is the reason for the invention of the income statement.

Grigg (2005) continued to introduce triple-entry accounting but is different from Ijiri's (1986) notion and works a little differently with double-entry accounting. When a transaction arises, a debit and a credit are reflected and those are linked to the third entry by using a financial cryptography called "digitally signed receipt" or central receipts (a cryptographic signature). Thus, this third dimension extension of accounting can be viewed by all participants, thus it can reduce information asymmetry and create a higher level of reliability.

Since then, triple-entry accounting has been associated with and developed based on distributed ledger technology, this is an innovation for increasing the accounting information transparency internally besides the world's other efforts, such as the IFRS framework for standardization and other legislative mechanism to bring transparency to global finance. Distributed ledger technology (DLT) is a technological protocol in which the role of intermediaries or any third party is removed, data can be exchanged directly between different contracting participants within a network in a more secure manner because of an encrypted identity (anonymously). Each transaction is coded and inserted in a chain, then duplicated and distributed across all network nodes (ledgers), and cannot be changed.

DLT is incorporated into accounting information systems (AIS), and it can be able to revolutionize an open AIS. Many researchers analyze the effect of Blockchain on Accounting Systems and examine the changes to be made to Accounting Information Systems to exploit this technology.

2. Literature review

In recent years, the number of research in blockchain has continued to grow rapidly. Pimentel and Boulianne (2020) surveyed academic studies in accounting blockchain, all research has been published after 2015 except the famous Grigg (2005) who first introduced the triple-entry accounting term. Literature about blockchain is diverse, such as areas of finance, accounting (Yoo et al., 2020), crypto payments in hospitality (Nuryyev et al., 2021), investigating blockchain in supply networks (Choi et al., 2020; Zhou et al., 2022), Bitcoin (Folkinshteyn and Lennon, 2016; Yoo et al., 2020). The growing number of publications shows a tendency of interest in this area, however, as mentioned in Pimentel and Boulianne (2020), the methodology is mainly conceptual papers (45%) in the form of reports, and case studies (26%). Some other authors applied the technology adoption model to investigate the use of blockchain in accounting (Folkinshteyn and Lennon, 2016; Borhani et al., 2021). The Innovation Diffusion Theory (Rogers, 1995) also could be found in research on blockchain in Bitcoin transaction services (Yoo et al., 2020), and in crypto payments in hospitality (Nuryyev et al., 2021). Many other articles provide empirical evidence or go deeper into the application of blockchain in real practices (Choi et al., 2020).

In blockchain databases, accounting and auditing grab the major interest of organizations and individuals, academics, and practitioners. Based on the reports of some leading adopters, Centobelli et al. (2022) emphasized the huge potential of blockchain, especially in enhancing the reliability of accounting when we can automatically verify the truthfulness of each transaction.

However, they also pointed out the application of Blockchain may encounter difficulties when the development of organizational habits may not keep up with the fast-changing of blockchain, maintain the system while lacking a completed legal framework, financial difficulties and limitations in technology as well as the lagged development of infrastructure.

In the accounting industry, some big names (E&Y, PWC, KPMG, Deloitte) are leading the way in embracing blockchain for accounting practices. For example, they have implemented some projects to adopt distributed ledger technology or blockchain software platforms to find a more powerful way of accounting: Crypto trading, reducing cost but more reliable and accessible. Thus, accountants need to change the way they work.

In the context of using blockchain in accounting and auditing, people are concerned about the future of accountants and auditors, this technology will eliminate their roles and put them aside. Thus, the attitude towards the application blockchain in doing their work is important.

In Vietnam, blockchain technology has become attractive to researchers in logistics applications (Danh, 2021), banking sectors, and journalism (Pham and Nguyet, 2023). Blockchain research in accounting has just been at the infant stage by introducing the technology or investigating its applications in internal auditing by comparing the blockchain-based internal audit and the traditional one. This study pays attention to the accounting and auditing field in a deeper investigation. Thus, based on professionals'/managers' perspectives, the study is expected to know how the accounting

profession/managers might respond to blockchain technology. Since then, it has brought meaningful and informative results to develop effective Blockchain applications in the Vietnamese scene based on IDT and TAM combination.

3. Research methodology

This research adopts TAM and IDT because those are the two most robust and widely used theories for understanding new technology innovation adoption. The combination could provide a better model than either standing alone. Based on reviewing TAM application research in blockchain, perceived usefulness, perceived ease of use, and Perceived risk are identified as the most salient and popular constructs. Perceived risk is included here because it is shown as a strong influencer, and it is considered one of the three most significant factors in technology adoption research besides PU and PEOU (Pavlou, 2003; Folkinshteyn and Lennon, 2016; Yoo et al., 2020). Two remaining variables from IDT are also incorporated into the model, namely compatibility and observability. Thus, the research framework is proposed in Fig. 2.

3.1. Hypothesis development

1. Perceived Usefulness (PU): Perceived usefulness (PU) reflects the users' perspectives on whether using blockchain can promote their performance in accounting/auditing works. Palos-Sanchez et al. (2021) demonstrated the positive influence of PU on using Bitcoin, a blockchain-based smart locker (Lian et al., 2020). Putting TAM in the context of financial reporting, Borhani et al. (2021) explained that the main reason for the adoption of blockchain in financial reporting is the perceived usefulness when it can have a positive impact on the qualitative characteristics of information. In terms of PU, hypothesis H1 states that individuals are more likely to have a positive attitude toward Blockchain in the case they feel that Blockchain will both beneficial for business in general and for accounting affairs in particular:

H1: Perceived Usefulness has a positive effect on Attitude towards Blockchain

2. Perceived Ease of Use (PEOU): Perceived ease of use (PEOU) is a variable referring to the adopter's opinion when they found that blockchain is not too complicated and free of effort to handle. PEOU is considered to have a direct effect on attitude through self-efficacy. Self-efficacy will increase if an individual considers that: The system is easy to operate, and they can perform the behavior required to operate the system (Davis at el., 1989). PEOU is a critical factor that will affect user acceptance of blockchain-based smart lockers (Lian et al., 2020). In testing the technological complexity of blockchain, Choi et al. (2020) provided positive evidence, that the more complicated, the higher the extent of resistance to Blockchain. Palos-Sanchez et al. (2021) confirmed the compatibility of the relationship between PEOU with attitude toward using Bitcoin. Palos-Sanchez et al. (2021) and Agustina (2019) gave positive evidence that when PEOU increases, the attitude toward using blockchain-cryptocurrency is getting higher. Based on these expectations, the following hypothesis is developed:

H2: Perceived Ease of Use has a positive effect on Attitude towards Blockchain.

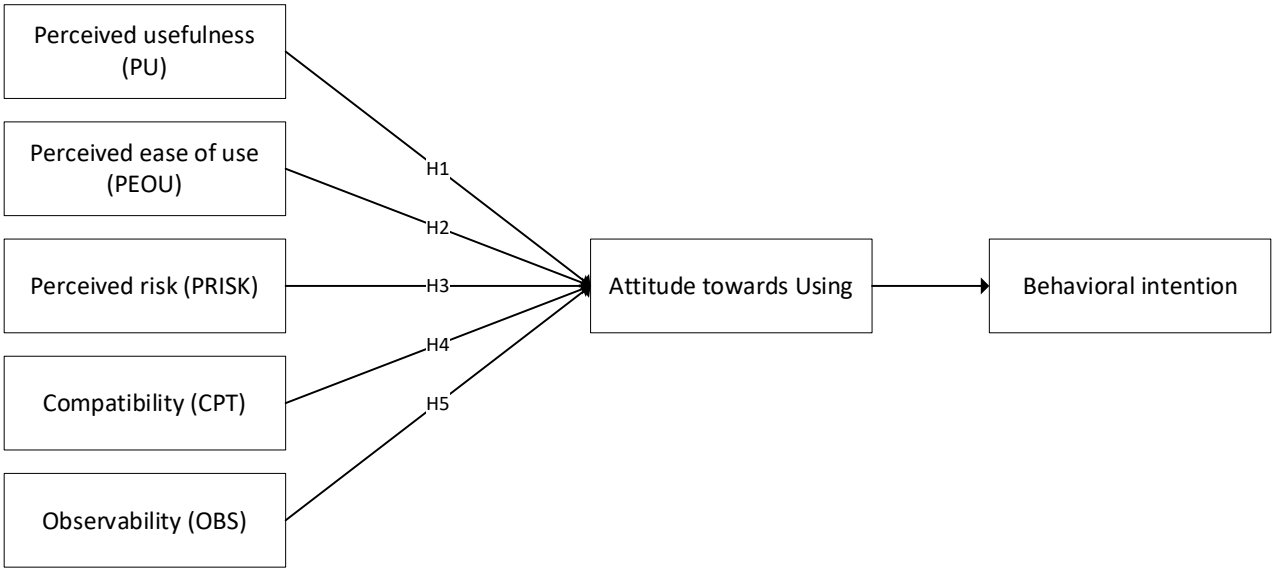

Fig. 2: The research framework

3. Perceived Risk (PRISK): Pavlou (2003), Folkinshteyn and Lennon (2016), and Yoo et al. (2020) emphasized in detail the vital role of perceived risk. The risk may be embedded in blockchain technology itself or the risk while working in a cyberspace environment. In addition, users are also afraid of the risk of becoming redundant in a high-tech accounting and auditing

field. Those may reduce the adoption rate of using blockchain. Perceived risk has been used to investigate consumer behavior in decision-making and technology adoption research since the 1960s (Taylor, 1974). In the situation of blockchain, the role of end-user perception of risk is important and also proved to be a significant factor (Chen and Farkas, 2019). However, the perceived risk in Choi et al. (2020) and Yoo et al. (2020) has no relation to resistance to the usage of blockchain. To facilitate the rate of blockchain adoption, risk understanding can facilitate the goal of the research. Hypothesis H3 is proposed as:

H3: Perceived Risk has a negative effect on Attitude towards Blockchain.

4. Compatibility (CPT): This study combines TAM and IDT, besides some similar factors, compatibility is considered a good explanatory factor for explaining the adoption of blockchain. Compatibility refers to the level at which blockchain is compatible and consistent with their past experiences, and meets the standards and needs of potential adopters. Choi et al. (2020) showed a negative correlation between compatibility and resistance to blockchain, prospective adopters may resist if they find the new technology does not merge or is not compatible with the current situation of existing technology. Wu and Wang (2005) and Yoo et al. (2020) confirmed that compatibility had a significant positive and direct effect on attitude and behavioral intention. Based upon the previous literature, the below hypothesis H4 is displayed:

H4: Compatibility had a positive effect on the Attitude of using blockchain technology.

5. Observability (OBS): Rogers (1995) argued that the level to which participants observe others practicing the application of innovative technology can affect the diffusion of that technology. Observability is a motivational factor that can encourage observers to become adopters. In line with Rogers (1995), this study is expected to find a positive direction between observability and attitude to adopt the technology. The hypothesis H5 for this correlation is hence presented as:

H5: Observability positively affects on attitude toward using blockchain technology.

6. Attitude towards Intention: In the TAM model, the causal relationship of variables towards the attitude of innovation usage and intention to use have been tested in many studies for using or avoiding computer-based technology (Reddy et al., 2021), in Bitcoin cryptocurrency (Palos-Sanchez et al., 2021). This study expected to confirm the tendency of management information system literature and propose hypothesis H6:

H6: There is a positive relationship between Attitude towards Use and Behavioral intention.

3.2. Methodology

To identify factors affecting users' attitudes towards Blockchain technology in accounting/auditing, the overall correlation model takes the form of *ATT=f (PU, PEOU, PRISK, CPT, CPX)*.

Based on the above research model, the multiple regression model will be built as follows:

$$ATT = \beta 0 + \beta 1\, PU + \beta 2\, PEOU + \beta 3\, PRISK + \beta 4\, CPT + \beta 5\, OBS + \varepsilon \quad (1)$$

where,
ATT: Attitude
PU: Perceived usefulness
PEOU: Perceived ease of use
PRISK: Perceived risk
CPT: Compatibility
OBS: Observability
ε: Error

To identify factors affecting users' intention towards Blockchain technology in accounting/auditing, the simple regression model in the form of *INT=f (ATT)* should be built as follows:

$$INT = \alpha o + \alpha 1\, ATT + \varepsilon \quad (2)$$

where,
ATT: Attitude
INT: Behavioral intention
ε: Error

In our analysis process, each item on the questionnaire is designed with a 7-point Likert scale, from strongly disagree to neutral and then, to strongly agree. We delivered (online, in-person) 500 questionnaires and finally received 355 feedback. However, we eliminated some records that haven't had any experience or understanding of Blockchain technology, and careless respondents. The remaining collected data from 225 respondents, then be put into SPSS for analysis. The results of descriptive as well as regression statistics are prescribed in section 4. In Vietnam, the immaturity of blockchain limits the sample of this research, thus, this study only focuses on respondents who at least have some basic knowledge about this new technology.

4. Results

4.1. Descriptive statistics

Table 1 shows the demographic details of the sample including gender, age, working experience, and educational background of respondents. Of 225, the female group accounts for 63 %. The age of respondents spans from less than 20 to more than 40, the group of 20 to 40 takes the highest percentage of 62%. The working experience is also

diversified with the highest ratio belonging to the 3-6-year group. In this research, almost all of the respondents are from accounting/auditing backgrounds. Table 2 reports a summary of the descriptive statistics for independent variables as well as dependent variables including mean, max, min, and standard deviation.

4.2. Factor analysis

Cronbach's alpha is a popular measurement of reliability. In this research, the Cronbach alphas of all scales are reported in Table 3. All the reliabilities have reached the acceptable percentage of around 0.7. In addition, we got the summarized Cronbach alphas in Table 4.

Table 1: Demographic characteristics

Description		Number	Ratio (%)
Gender	Male	83	37
	Female	142	63
Working experience	Less than 3 years	65	29
	3-6 years	85	38
	6-10 years	47	21
	over 10 years	28	12
Age	Less than 20	28	12
	From 20 to 40	139	62
	More than 40	58	26
Education	Accounting/Auditing	102	45
	Management	67	30
	IT	56	25

Table 2: Dependent and independent variables

Variables (take average)	Observations	Mean	Max	Min	SD
Perceived usefulness	225	5.0830	6.83	2.67	0.92744
Perceived ease of use	225	4.8459	6.83	1.50	1.01451
Perceived risk	225	4.9671	7.00	2.80	0.98032
Comparability	225	4.5478	7.00	1.00	1.06278
Observability	225	4.4200	6.75	1.00	1.12784
Attitude	225	4.9037	7.00	1.33	1.11230
Intention	225	4.9452	7.00	1.67	1.03265

Table 3: Cronbach alpha-reliability scale

Variables	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha if item deleted
Perceived usefulness: Alpha=0.810				
PU 1	25.31	22.376	.575	.779
PU 2	25.41	22.529	.566	.781
PU 3	25.35	21.211	.585	.777
PU 4	25.41	21.190	.630	.766
PU 5	25.61	23.917	.516	.792
PU 6	25.39	22.703	.551	.784
Perceived ease of use: Alpha=0.842				
PEOU 1	24.28	25.442	.738	.792
PEOU 2	24.23	24.580	.813	.776
PEOU 3	24.37	29.430	.462	.845
PEOU 4	24.46	28.660	.455	.849
PEOU 5	24.19	24.590	.802	.778
PEOU 6	24.05	29.274	.479	.842
Perceived risk: Alpha=0.735				
PRISK 1	20.07	13.500	.501	.688
PRISK 2	19.77	13.006	.513	.683
PRISK 3	19.62	13.825	.491	.692
PRISK 4	19.64	13.302	.493	.691
PRISK 5	20.24	13.976	.486	.694
Compatibility: Alpha=0.797				
CPT 1	13.40	12.579	.447	.818
CPT 2	13.77	10.551	.649	.726
CPT 3	13.76	9.681	.732	.681
CPT 4	13.64	10.669	.616	.743
Observability: Alpha=0.735				
OBS 1	13.61	12.774	.490	.696
OBS 2	13.33	12.402	.585	.643
OBS 3	13.31	12.358	.491	.697
OBS 4	12.78	12.305	.545	.664
Attitude: Alpha=0.795				
ATT 1	9.82	5.239	.596	.771
ATT 2	9.70	5.703	.640	.720
ATT 3	9.84	5.355	.684	.672
Intention: Alpha=0.751				
INT 1	9.88	4.833	.530	.725
INT 2	9.74	4.953	.583	.663
INT 3	9.76	4.663	.625	.613

The factor analysis technique is used for identifying the items of each construct, for summary and data deduction. After testing the reliability, EFA (exploratory factor analysis) is employed, and the results are presented in Table 5 and Table 6. The results are shown in Table 5 in terms of KMO and

Barlett's test. Table 6 displays the results of the Extraction of Component Factors. Five factors are developed in this study with 25 analyzed items. All the Eigenvalues are greater than 1, the total variances are explained as nearly 60% and considered to be accepted. While using factor analysis with the VARIMAX rotation technique, VARIMAX can maximize the sum of variances of required loadings of the factor matrix. The loadings presented in Table 6 are far from 0 and more than 0.5, those indicate a clear positive or negative association between the items and the factor respectively.Additionally, we have factor loading for dependent variables: The separated results for Attitude and Intention are shown in Table 7 in terms of KMO and Barlett's test, factor deduction with Varimax rotation for factor loading in Table 8.

Table 4: Scale reliabilities

Scale	Number of items	Reliability
Perceived usefulness	6	0.810
Perceived ease of use	6	0.842
Perceived risk	5	0.735
Compatibility	4	0.797
Observability	4	0.735
Attitude	3	0.795
Intention	3	0.751

Table 5: KMO and Bartlett's test

Kaiser – Meyer – Olkin measure of sampling adequacy		.776
Bartlett's test of sphericity	Approx. chi-square	2275.013
	df	300
	Sig.	.000

Table 6: Factor analysis: Rotated component matrix

Name of items	Loading					Eigenvalue	Variance explained
PU 1	.693						
PU 2	.698						
PU 3	.776						
PU 4	.758						
PU 5	.570						
PU 6	.613					4.781	19.125
PEOU 1		.870					
PEOU 2		.914					
PEOU 3		.579					
PEOU 4		.577					
PEOU 5		.896					
PEOU 6		.593				3.687	33.872
PRISK 1			.667				
PRISK 2			.670				
PRISK 3			.722				
PRISK 4			.628			2.365	43.331
PRISK 5			.655				
CPT 1				.573			
CPT 2				.714			
CPT 3				.851			
CPT 4				.784		1.788	50.481
OBS 1					.693		
OBS 2					.744		
OBS 3					.748		
OBS 4					.751	1.567	56.748

Extraction method: Principle component analysis; Rotation method: Varimax with Kaiser normalization

Table 7: KMO and Bartlett's test

Variable name		Attitude	Intention
Kaiser – Meyer – Olkin measure of sampling adequacy		.698	.679
Bartlett's test of sphericity	Approx. chi-square	210.1713	161.0563
	df	.000	.000
	Sig.		

Table 8: Factor analysis: Rotated component matrix (2)

Name of items	Loading	Eigenvalue	Variance explained
	Attitude		
ATT 1	.813		
ATT 2	.846		
ATT 3	.872	2.136	71.214
	Intention		
INT 1	.708		
INT 2	.823		
INT 3	.849	2.007	66.889

Extraction method: Principle component analysis; Rotation method: Varimax with Kaiser normalization

4.3. Simple regression and multiple regression

4.3.1. Explaining attitude

The multi-regression analysis has been set up for this research with five hypotheses. After running the regression model by using SPSS, the analyzed results are shown in Table 9. Table 9 showed that F=30.688 with p=0.000<0.1, which means that the created model exists. In addition, the adjusted R2 is 39.9 %. Thus, this regression model can explain 39.9 % of the total variance.

The values of VIF are acceptable, between 1 and 2, much lower than 10, which means the multicollinearity is not attained in our dataset. The multi-regression analysis provides us with the output in Table 10, four out of 5 variables are significant. Those *PUnew*, *PEOUnew*, *CPTnew*, and *OBSnew* are significant predictors of *ATTnew*.

We conclude that there is a linear regression between variables at the significant level of 0.01 (all p-value<0.1):

$$ATTnew = -0.428 + 0.278\,PUnew + 0.129PEOUnew + 0.254\,CPTnew + 0.422\,OBS\,new + \varepsilon \quad (3)$$

If the variable *PUnew* changes 1, the attitude towards adoption blockchain will have 0.278 units change. The biggest magnitude of change comes from *OBSnew* with a coefficient of 0.422 while the lowest is *PEOUnew* of 0.129.

Table 9: Model summary for linear regression

Model	R square	Adjust R square	F-test	
			F	Sig.
1	.412	.399	30.688	.000

Predictors: (Constant), *PU.new, PEOU.new, PRISK.new, CPT.new, OBS.new*; Dependent variable: *ATTnew*

Table 10: Coefficients of linear regression model

Model		Unstandardized coefficient		Standardized coefficients	t	Sig.	VIF
		ß	Std. error	Beta			
1	Constant	-.428	.516		-831	.407	
	PU new	.278	.070	.232	3.976	.000	1.270
	PEOU new	.129	.058	.118	2.246	.026	1.035
	PRISK new	.053	.073	.042	0.725	.469	1.265
	CPT new	.254	.062	.243	4.087	.000	1.317
	OBS new	.422	.053	.429	8.001	.000	1.071

Dependent variable: *ATTnew*

4.3.2. Explaining intention

In addition to the above multi-regression, we explore the relation between ATT and INT. Therefore, we expect to have linear regression as below:

$$INT = \alpha 0 + \alpha 1 \times ATT + \varepsilon \quad (4)$$

After running the regression model by using SPSS, the analyzed results are presented in Table 11. Table 11 showed that F=52.637 with p=0.000<0.1, which means that the created model exists.

The value obtained for Adjusted R2=18.7 %, indicates that this model can explain 18.7 % of the variance in the behavioral intention to use blockchain (dependent variable), the remaining is due to the out-of-model variables and random errors.

A regression model (Table 12) between variables was created as below:

$$INTnew = 2.903 + .407\,ATTnew + \varepsilon \quad (5)$$

We can conclude that in the context of adopting blockchain in accounting, Attitude (ATT) is a good explanatory factor, the higher the positive attitude, the higher the level of intention to adopt this new technology in accounting.

Table 11: Model summary for linear regression

Model	R square	Adjust R square	F-test	
			F	Sig.
1	.191	.187	52.637	.000

Predictors: (Constant), *ATTnew*; Dependent variable: *INTnew*

Table 12: Coefficients of linear regression model

Model		Unstandardized coefficient		Standardized coefficients	t	Sig.	VIF
		ß	Std. error	Beta			
1	Constant	2.903	.282		10.303	.000	
	ATT new	.407	.056	.437	7.255	.000	1.000

Dependent variable: *ATTnew*

4.4. Summary of results

In summary, based on the magnitude of the regression coefficients, arranging from the strongest to the weakest impact on ATT: OBS (0.422), PU (0.278), CPT (0.254), and PEOU (0.129). ATT and INT with a regression coefficient of 0.407 show a strong relation between the two.

Regarding the TAM model hypothesis, the coefficient between PU and ATT is 0.278, significant at the level of 99%, when potential adopters recognize blockchain can help to improve their performance both for their work and even for their careers, they will have a positive attitude to adopt blockchain. This result is in line with Lian et al. (2020), Palos-Sanchez et al. (2021), and Borhani et al. (2021). We accept hypothesis H1.

The positive relation between PEOU and ATT is also confirmed by coefficient=0.129, and p-value=0.026. Even though blockchain is a new term and it may have some complicated features embedded inside, if potential adopters feel it is easy to use, they do not need too much effort to execute it, and they will be inclined to be real adopters (Agustina, 2019; Choi et al., 2020; Lian et al., 2020). Hypothesis H2 is supported as proposed.

In this research, perceived risk is expected to have a negative effect on the adoption rate. However, the result does not prove any correlation between the two variables, with a coefficient=0.053 with a p-value=0.469. We reject the H3

In terms of compatibility variables, a combination between TAM and IDT, this study's result (coefficient=0.254, p-value=0.000).

This result is consistent with the expectation of the proposed hypothesis H4 as well as other works (Wu and Wang, 2005; Choi et al., 2020). When considering compatibility as a good predictor, potential can compare how beneficial blockchain can bring to their needs and past experiences.

It is noted that if individuals have chances to observe others practice and apply blockchain technology, they will find it as a motivational factor and observability can encourage observers to become adopters in technology acceptance. We accept the H5 for relation between observability and attitude (coefficient=0.422, p-value=0.000).

In this research, for the linear correlation between attitude and behavioral intention (coefficient=0.407, p-value=0.000), the positive effect is founded in this research, and it is consistent with some other in computer-based technology (Reddy et al., 2021), or in Bitcoin cryptocurrency (Palos-Sanchez et al., 2021).

5. Conclusions, limitations, and future research

The contemporary landscape of the accounting profession has witnessed a transition towards a more modernized and open AIS. The introduction of blockchain technology, although potentially disruptive to established career paths, holds the promise of transformative change, enhancing not only the field of accounting itself but also the accounting profession at large. Consequently, there exists a compelling need to raise awareness, foster comprehension, and promote the acceptance of this groundbreaking technology within the accounting domain.

Within the framework of this study, all hypotheses present statistically significant relationships between variables, with the exception of "Perceived risk." From a theoretical perspective, this study contributes to the body of empirical literature by elucidating the factors influencing attitudes and intentions toward the adoption of blockchain technology in accounting.

The discourse surrounding blockchain's application in accounting and auditing is robust, yet it remains in its nascent stages, poised for rapid future expansion. An examination of the perspectives of accountants, auditors, and managerial figures regarding the adoption of blockchain technology would offer valuable insights into managerial implications for its utilization and enhancement.

Nonetheless, this study predominantly draws information from individuals working within the realms of accounting and auditing. Future research endeavors should encompass a broader spectrum of respondents to garner diverse viewpoints. Additionally, participants in this study exhibit limited knowledge of blockchain and limited exposure to its practical applications, constituting a notable limitation. Addressing this gap, future research should delve deeper into practical aspects, such as the potential utilization of blockchain in smart contracts, the Internet of Things (IoT), and smart property management.

Furthermore, future research initiatives should expand sample sizes and encompass diverse fields of blockchain applications. A promising avenue for exploration lies in the examination of blockchain's role in fostering transparency across data storage, processing, and provision—an area ripe for extensive study within the blockchain discourse.

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Compliance with ethical standards

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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