Contents lists available at GrowingScience

International Journal of Data and Network Science

homepage: www.GrowingScience.com/ijds

Antecedents of adoption blockchain: Empirical study in Jordanian firms

Ra'ed Masa'deh[a*], Lina H. Warrad[b], Khaldoon Jahmani[c], Dmaithan Almajali[a,b], Salwa AL Majali[d], and Ahmad Tawfig Al-Radaideh[c]

[a]*The University of Jordan, Jordan*
[b]*Applied Science Private University, Research Unit, Middle East University, Jordan*
[c]*Jadara Uinversity, Jordan*
[d]*Al Ain University, United Arab Emirate*

C H R O N I C L E

Article history:
Received: January 6, 2024
Received in revised format: February 20, 2024
Accepted: April 29, 2024
Available online: April 29, 2024

Keywords:
Intelligent Systems
Blockchain Technology
Accounting Systems and Business Intelligence

A B S T R A C T

The increasing popularity of intelligence systems in accounting and auditing domains has led to the interest towards drivers of blockchain technology adoption. Consequently, this empirical study inspected the antecedent constructs with direct and indirect impact on blockchain technology adoption in the accounting domain. Data were gathered from 346 accountants employed in Information technology (IT) companies, through an online survey. Structural equation modeling with Smart PLS 4 was employed for research model testing. Out of thirteen proposed direct hypotheses, twelve were accepted. Mainly, the obtained empirical results confirmed effort expectancy impacting blockchain technology adoption the most. Furthermore, the obtained results also confirmed the mediation role of effort expectancy and performance expectancy.

1. Introduction

Almost all domains and professions have been modified as a result of technological advancement, as can be seen in the domain and profession of accounting. Different innovative technologies, as can be exemplified by artificial intelligence (AI), the internet of things (IoT), as well as blockchain, have emerged today, and these technologies have had a significant impact on enterprise operations, including the operations involving accounting system (Zhang et al., 2020; Maffei et al., 2021). Furthermore, technological improvements are complicating transactions more and more. Meanwhile, cross-border transactions necessitate those involved to act honestly and truthfully during information sharing, among others (Gomez-Trujillo et al., 2021), which might be accomplished via the application of blockchain technology.

By combining all available news sources, business intelligence can produce something that is more valuable as opposed to all of its parts combined. This is accomplished by taking advantage of the operational data offered by the resource planning system of the enterprise and turning them (the data) into perceptive information supporting the strategic objectives of the business (Al-Mobaideen, 2014). Fact-checking and in-depth analysis should be carried out across organizations, and to enable these activities, business intelligence (BI) tools and communication infrastructure must integrate multiple data sources into a standard framework. In general, business value extraction from data is business intelligence (BI). When business intelligence tools can recognize the firm's information systems, for instance, information on customer, employee, procurement, production, marketing and advertising activity, and information on other references deemed as vital information, they are able to make more intelligent decisions more effectively (Khan, 2019; Muntean & Cabau, 2011). Without a doubt, the correctness of the information employed in forming the decisions of a firm will influence the caliber of those conclusions (Kilani, 2022). In this

* Corresponding author.
E-mail address r.masadeh@ju.edu.jo (R. Masa'deh)

ISSN 2561-8156 (Online) - ISSN 2561-8148 (Print)

doi: 10.5267/j.ijdns.2024.4.017

regard, managers may make decisions that are both profitable and productive when they think through both the internal operations of the business and the external environment in which the business operates.

The concept of Business Intelligence (BI) has become more important as "big data" and blockchain technologies have become more accessible (Agarwal & Dhar, 2014). Accordingly, BI, blockchain technology, and big data analytics are topics with close connections, and they have considerably grown within the academia and the sector of industry, during the past two generations (Chen et al., 2012; Daneshvar Kakhki & Palvia, 2016). These types of business intelligence can perform timelier and more relevant operations and actions, as opposed to the use of human efforts, when combined with big data and blockchain technology. IT development companies use business intelligence in testing and in production as well (Wamba-Taguimdje et al., 2020).

Therefore, it was established that cutting-edge technologies (e.g., business intelligence and blockchain) affect firm performance. The integrated BI system has been found to be a dependable and efficient tool for managing supply chains and corporate capacity planning. Big data analytics and blockchain, when combined, lead to significant contributions of BI in improving firm performance in the market. These systems are generally capable of executing the requested feature, but they appear to be lacking the instruments required in data analysis and reporting. Information systems can continue down a steady path of innovation with the help of BI technologies (Al-Measar, 2015; Chou, 2018).

Blockchain adoption has drawn more scholarly attention, but extant studies mostly were concentrated on the supply chain factor (Kabir & Islam, 2021; Alazab et al., 2021). As a result, the current study aimed to bridge the gap perceived between theory and practice about blockchain adoption within the accounting field. Notably, the evaluation of Blockchain technology adoption has been mostly from the practitioners' viewpoint. This situation can be attributed to the lack of actual data available. Furthermore, the original UTAUT (Unified Theory of Acceptance and Use of Technology) was the version used in earlier studies (see: Milosavljevic et al., 2019) and for this reason, the findings provided no explanation on the way blockchain impacted technology acceptance within the realm of accounting – this has been considered as a shortcoming. Hence, Milosavljevic et al. (2019) and Ferri et al. (2020) proposed expanding the UTAUT model to make it more comprehensive. As highlighted by Rahi et al. (2018), the comprehensiveness of the UTAUT model makes it an appropriate model in examining acceptability of technology at the individual level.

UTAUT has been applied in many studies on blockchain usage intention among practitioners as can be exemplified in Choi et al. (2020) and Wamba and Queiroz (2022), in their attempt to explain what motivates accountants to use blockchain technology. The factors of information quality, trust and job relevance were among the qualities of blockchain that made up the external constructs in accounting domain. Computer compatibility and self-efficacy were also found to affect the acceptance of practitioners towards blockchain technology. Additionally, a strong fit between theory and practice has been reported. Furthermore, benefits of blockchain usage has been reported, including reduced bookkeeping fraud and more accurate financial reporting information (Cai, 2021). Meanwhile, in the context of Jordan, Vo and Phan (2017) and Ngo and Le (2021) found rudimentary stock market while the disclosed financial statements were below-par in terms of quality.

The practices of earnings management in firm's financial statement preparation have been reported to frequently occur in developing countries and this situation has been considered as a serious problem (Lourenço et al., 2018). However, these practices can be eradicated with the implementation of blockchain technology. Also, for accountants, blockchain usage will free them from being pressured by the earnings management behavior manifested by their managers (Jenkins et al., 2018; Sheldon, 2018; Yu, 2019). They (the accountants) could also improve their performance. Hence, the acceptability of blockchain among accountants in Jordan as an underdeveloped nation should be ascertained. Accordingly, an online survey was carried out in Jordan, involving 346 selected accountants with technology expertise - these accountants were hired by IT companies operating in Jordan. Through the survey, the effects of blockchain adoption within the accounting domain, both the direct and indirect effects, were examined, with the use of expanded UTAUT model. It was concluded that blockchain adoption increases with the increase in performance expectations trust in the technology. Also, the self-efficacy of the accountants with computers and compatibility with blockchain will affect their effort expectations, leading to improved blockchain adoption. Finance, auditing and blockchain all share similarities, and therefore, similar studies could be carried out in these three domains (Bonson & Bednarova, 2019; Liu et al., 2019).

Accountants in Jordan have been demonstrating a keen interest towards blockchain usage. This implies the need to develop blockchain training programs or open training sessions for blockchain. Also, the literature is showing the significance of UTAUT as a technology adoption theory owing to the potential direct impact and mediation of its constructs – both in indirect relationships and in practice - on blockchain adoption. For accountants, it is clear that blockchain will have desirable effect on their professional performance. Also, considering that blockchain has not been regarded as a challenging technology to use, it is expected that this technology will have high acceptability among accountants (Venkatesh et al., 2003; Davis, 1989).

2. Research Framework and Hypotheses Development

The UTAUT tool by Venkatesh et al. in 2003 has been widely utilized to assess personal technology use. UTAUT is viewed as a rather complete model since it incorporates eight models associated with technology adoption (Wamba & Queiroz, 2022).

Many blockchain technology studies have criticized the structures of UTAUT, for instance, Wong et al. (2020) and Alazab et al. (2021) indicated the use of the original UTUAT components – in some studies - as research constructs or as mediators. Ferri et al. (2020), in their examination of the intent of the auditor to use blockchain, expanded the UTAUT model through the addition of two dimensions, namely computer self-efficacy and job relevance.

2.1 UTAUT Constructs

Performance expectation, effort expectancy, and social influence are the primary constructs in UTAUT model presented by Venkatesh et al. in 2003. The performance expectancy construct, which is based on perceived usefulness describes the certainty of a user that new technology usage would result in improved performance. The construct of effort expectancy concerns the level to which user is sure that new technology usage is simple – effort expectancy is identical to perceived ease of use (Yaseen & El Qirem, 2018). Regarding the concept of social influence, it can be said that it refers to how confident a user is, that his or her close friends and family agree that they should utilize the new system. As explained in Venkatesh et al. (2003), these three constructs have a big impact on people when adopting new technologies. The comprehensiveness of UTAUT model has made the model popular in technology related literature, on technology use intention. With UTAUT, technology adoption in the workplace could be accelerated and practitioners could gain better understanding of the factors impacting technology acceptance (Tran & Nguyen, 2021). In Malaysia, Musa et al. (2019) analyzed the justifications for cloud accounting usage intention among SMEs. In their review, the authors concluded UTAUT as the best model for cloud accounting deployment in Malaysia. In Sri Lanka, Haleem (2020) employed UTAUT criteria in cloud accounting adoption analyses involving data from 354 SME managers. Results showed the highest impact of effort expectancy on cloud accounting use intention, followed by social influence and performance expectancy. Cokins et al. (2020) reported comparable outcomes.

In Italy, Ferri et al. (2020) studied blockchain adoption among accounting firm auditors. The authors found performance expectancy demonstrating the strongest relationship with blockchain use intention, followed by the factors of effort expectancy and social influence. The hypotheses below were hence proposed:

H_1: *Blockchain technology adoption is positively impacted by performance expectancy.*

H_2: *Blockchain technology adoption is positively impacted by effort expectation.*

H_3: *Social influence influences blockchain adoption in a positive way.*

Furthermore, using the UTAUT model, a positive linkage between effort expectancy and performance expectancy was concluded by Buabeng-Andoh and Baah (2020), and the impact seemed significant. Hence, the hypothesis below was proposed:

H_4: *Performance expectancy is positively impacted by effort expectancy*.

2.2 Constructs Associated with Blockchain Accounting Features

Job Relevance

Job relevance is the degree that a system is pertinent to a person's line of work (Venkatesh & Davis, 2000). Accountants face constant pressure to provide accurate financial statements on time. According to Jenkins et al. (2018), bookkeeping scams and managerial earnings manipulations are frequent in traditional accounting. However, thanks to distributed ledger technology and smart contracts in the blockchain, these frauds can now be completely eliminated. Ferri et al. (2020) also noted a positive connection between performance expectations and work relevance. The following hypothesis was put forth:

H_5: *Performance expectations are positively impacted by job relevance.*

Quality of Accounting Information

The elements of timeliness, relevance, comparability, faithful representation, in addition to verifiability, may be utilized to indicate the quality of accounting information when considering blockchain within the accounting setting (Wu et al., 2019). The qualities found to impart impact on the quality of accounting information include relevance, faithful depiction, as well as importance (Obaidat, 2007). Blockchain is useful in the accounting industry because of the aforementioned characteristics (Qasim & Kharbat, 2020). Blockchain adoption in China was studied by Liu and Ye in 2021, and they found that it improved the quality of the information and labor productivity. As a result, the following hypothesis was suggested:

H_6: *The quality of accounting information has a favorable impact on performance expectations.*

Trust

Centralized authority is unnecessary in blockchain, and so, people are able to work together with confidence (Brigham & Houston, 2021) since the distributed ledger's irreversible nature encourages user trust. In actuality, accounting fraud is

anticipated to be thwarted by this technology (Pedreo et al., 2021). The simplicity of blockchain application will make people want to use it more (Albayati et al., 2020). Also, blockchain adoption has been associated with expected performance once this technology's application is understood (Wamba & Queiroz, 2022). A growth in user trust in technology, for example, will enhance performance expectations (Zhou, 2014). In addition, Lee and Song (2013) and Zhou (2014) demonstrated that trust has a beneficial impact on expected effort and block chain adoption when analyzing technology use intentions. Furthermore, since trust has been shown to improve performance, blockchain adoption studies generally would include the concept of trust (Kabir & Islam, 2021). Hence, hypotheses were put forth:

H_7: *Expectations for performance are boosted by trust.*

H_8: *Expectation of effort is positively impacted by trust.*

H_9: *Blockchain technology adoption is influenced favorably by trust.*

Computer Self-efficacy

Based on Venkatesh et al. (2003), computer self-efficacy can be understood as the degree to which a given individual is sure of their ability in executing a particular task or job using a computer. This construct (computer self-efficacy) also appears to have a significant relationship with people's expectations for using computers. Relevantly, Ferri et al. (2020) discovered a favorable link between effort expectancy and computer self-efficacy. Consequently, the following hypothesis was put forth:

H_{10}: *The expectation of effort is positively impacted by computer self-efficacy.*

Compatibility

According to Calisir et al. (2009), compatibility can be perceived as the level to which an invention is thought to be in keeping with the values, prior experiences, and needs of prospective users. In other words, according to Peng et al. (2012), this construct is connected to the current values, actions, and experiences of practitioners with regard to first-hand technology. All transactions are automatically recorded in the blockchain ledger when triple-entry accounting is used. As the accountant simply needs to review the blockchain ledger information in this case, there is no need to record anything in a book, which reduces the accountant's responsibility for accounting. As a result, Cai (2021) saw blockchain as more advantageous than difficult. It also encourages accountants to improve their "compatibility" to achieve blockchain's usability because it will speed up the acceptance of new technology (Farshidi et al., 2020). The accountants will use the technology more quickly and competently if it is compatible with their needs. In a related study, compatibility and blockchain adoption was found to be positively correlated (Clohessy & Acton, 2019; Malik et al., 2021). The hypotheses below were hence proposed:

H_{11}: *Compatibility has a favorable impact on expected effort*.

H_{12}: *The adoption of blockchain is positively impacted by compatibility.*

Business Intelligence and Blockchain

The groundbreaking blockchain technology has resulted in the formation of new concepts of secure and private exchange of information. The blocks of this new technology allow the dispersal and sharing of networks that securely store all transactions (Salah et al., 2019; Lahami et al., 2022). In this regard, hashing, global accord techniques, and digital signatures have been among the commonly used technologies, and the transactions do not require validation and verification from third parties as there is no need for centralized authority in the completion of the transactions (Litke et al., 2019). Blockchain technology provides the source and traceability of critical products (Krichen et al., 2022) – which is regarded as an advantage of this technology. Furthermore, the performance gap between a public blockchain and a traditional database can be linked through simpler consensus mechanisms. Blockchain is a strong digital platform for financial connections, allowing the documentation of nearly all that are considered valuable. Initially, blockchain was developed for tracking financial transactions. For auditors, blockchain allows them to concentrate on complex and internal control systems. Hence, having blockchain in place, auditors no longer need to monitor repetitive transfers, which means that they have more time with blockchain implementation. Also, blockchain assures accurate digital performance of physical assets and correctly written agreement (in compliance with the standards) amidst the alteration of the techniques and scope of individual opinions (EY, 2017). Furthermore, with the endorsed key performance measures in place, all efforts would be in the right direction, resulting in reckonable successes (Zhang et al., 2020). Blockchain affects partnerships. It also affects firm performance significantly, and the use of GPS allows tracking of things in the lifetime of a firm, which facilitates the composting, reprocessing, and renewability processes (Kim & Shin, 2019). Utilizing a monitoring system, Kouhizadeh et al. (2019) illustrated the use of blockchain technology. Through blockchain, transaction history can be preserved, and so, the effectiveness of the circularity management procedure can be tracked. Meanwhile, as indicated by Bromiley and Rau (2014), a process can be understood as an exercise or set of exercises which may be executed by firms in various industries, and the practice-based view (PBV) demonstrates the increase of such variations by stating that firm performance is linked to the usage of certain and transferrable firm operations. PBV classes the organization as the dependent variable, while blockchains are the methods that are applied together into business operations

(Rehman Khan et al., 2022). It is possible that blockchain-based technology progressions affect the revolutionary transformation of organizational and financial performance. The following research hypothesis was hence proposed:

H13: *The adoption of blockchain is considerably and favorably influenced by business intelligence.*

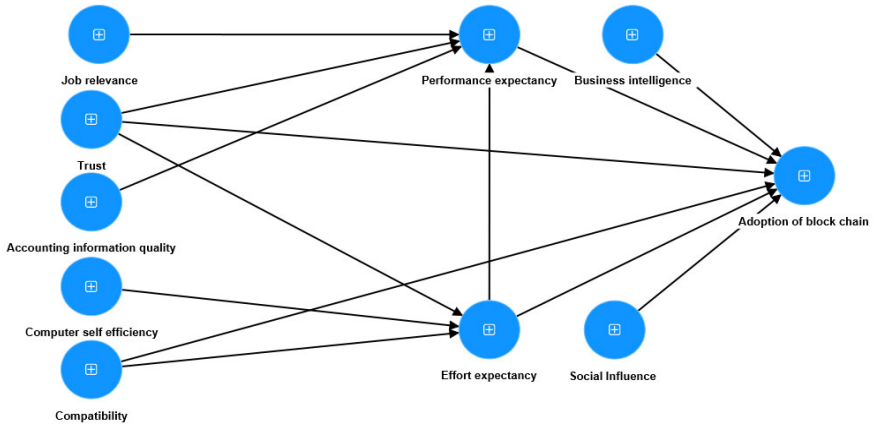

Fig. 1. Research Model

3. Research Methodology

3.1 Research design

A quantitative method as described by Creswell et al. (2008) was employed in the current work, with survey questionnaires as a data gathering tool. Open-ended and closed-ended items were used for the questionnaire, and the responses were in the form of nominal and ordinal scales. Data was obtained from Jordanian IT employees. Scales previously validated were used in the questionnaire. A total of 40 advanced IT firms with business intelligence services were chosen using a convenience sampling method – the researcher selected those easily reached. Convenience sampling method as the non-probability sampling is suitable in studies that explore new topics (Schreuder et al., 2001), but frequently yields lower representativeness level. The total number of employees chosen as respondents was 346 and these respondents had knowledge on the subject under study. These firms employed BI to ease their transactions with the customer daily. The questionnaire was distributed through email, and the respondents participated willingly. The details are discussed next.

3.2 Questionnaire development

The questionnaire used in this study comprised items which were both valid and reliable as they were adapted from past studies. UTAUT construct items were included in the questionnaire, with job relevance and computer self-efficacy (refer Ferri et al., 2020) being the two additional constructs. As for trust and accounting information quality items, they were based on Liu and Ye (2021) – these items were edited by blockchain experts, and were well calibrated. The construct of accounting information entails different information characteristics (Abu Afifa & Saleh, 2022). Items representing the construct of compatibility were obtained from Kumar Bhardwaj et al. (2021), and during pilot testing, ten supply chain professionals working in different industries revised these items. Items that cover the construct of business intelligence were adapted from two studies, namely the studies performed by Aydiner et al. (2019) and Hindle and Vidgen (2018). Items representing the construct of blockchain technology adoption were adapted from the questionnaire items used by Maroufkhani et al. (2020), while items on social influence, performance expectancy, and effort expectancy were similar to questionnaire items used in Venkatesh et al. (2003) and Ferri et al. (2020).

3.3 Data Analysis and Results

The current study employed PLS-SEM in examining the relationship between constructs in the model as proposed by (Hair et al., 2011). SmartPLS was used alongside PLS-SEM as proposed by Ringle et al. (2015). Indeed, the use of PLS-SEM in Blockchain can be observed in several studies including Queiroz and Bamba (2019, 2020) and Wong et al. (2020). Additionally, the proposed model in this study was tested to ascertain its validity and the test involved two stages (Hairet al., 2016), whereby during the first stage, the quality of the measurement model was tested, followed by the second stage which involved the testing of the predictive power of the structural model. The reliability indicator was examined in measuring the quality of the study's measurement model. It can be observed in Table 1 that the items all scored loadings of greater than 0.7 on their latent, and the same can be observed for the achieved Cronbach's alpha and composite reliability (CR) index – all achieved values greater than 0.7. Based on Hair et al. (2011), all constructs in the model were reliable. Convergent validity was examined as well, with average variance extracted (AVE) for each block being greater than 0.50, affirming convergent validity as suggested by Hair et al. (2016). Discriminant validity of the items was evaluated using Fornell–Larcker criterion (Fornell &

Larcker, 1981), and the square root of all constructs was all higher in comparison to their correlations with the other ones in the off-diagonal position. Heterotrait-Monotrait (HTMT) criterion was lower than 0.90.

Table 1
The results of item loading

COSTRUCT	ABC	AIQ	BI	C	CSE	EE	JR	PE	SI	T
ABC1	0.799									
ABC2	0.816									
ABC3	0.857									
ABC4	0.776									
ABC5	0.772									
AIQ1		0.883								
AIQ2		0.925								
AIQ3		0.929								
AIQ4		0.91								
AIQ5		0.895								
BI1			0.783							
BI2			0.851							
BI3			0.743							
BI4			0.751							
C1				0.842						
C2				0.861						
C3				0.651						
CSE1					0.836					
CSE2					0.913					
CSE3					0.792					
CSE4					0.866					
EE1						0.885				
EE2						0.91				
EE3						0.922				
EE4						0.897				
EE5						0.873				
JR1							0.852			
JR2							0.714			
JR3							0.842			
JR4							0.816			
PE1								0.897		
PE2								0.885		
PE3								0.929		
PE4								0.875		
SI1									0.832	
SI2									0.881	
SI3									0.816	
SI4									0.881	
TR1										0.629
TR2										0.813
TR3										0.834
TR4										0.814

3.4 Measurement model

Results in Tables 2 and 3 on the indicators of the measurement model affirmed reliability – all indicators showed a load factor of 0.6 at least. However, PEU was removed because of its low score (lower than 0.6). The score of composite reliability (CR) and Cronbach's alpha (CR alpha) as shown in Table 2 was greater than 0.7 for all constructs, while the AVE of all constructs was lower than 0.5, demonstrating convergent validity.

Table 2
Convergent Validity

Construct	Cronbach's alpha	CR	AVE
Accounting information quality	0.947	0.949	0.826
Adoption of blockchain	0.864	0.867	0.648
Business intelligence	0.799	0.895	0.613
Compatibility	0.707	0.764	0.625
Computer self-efficiency	0.879	0.926	0.727
Effort expectancy	0.94	0.94	0.806
Job relevance	0.821	0.829	0.653
Performance expectancy	0.919	0.92	0.804
Social Influence	0.882	0.932	0.727
Trust	0.788	0.833	0.604

Discriminant validity was examined using HTMT criteria, resulting in HTMT values lower than 0.90. Based on Hair et al. (2019), the constructs demonstrated discriminant validity. As the final step, as proposed by Podsakoff et al. (2003), a full-collinearity approach was used as proposed by Kock and Lynn (2012) to ascertain the model's Common Method Bias. The highest Internal VIF was 3.79 and this affirmed that the measurement model is valid, as the obtained value was smaller than 5 proposed by Hair et al. (2016).

Table 3
Discriminant Validity

Constructs	AIQ	ABC	BI	C	CSE	EE	JR	PE	SI	T
Accounting information quality										
Adoption of block chain	0.28									
Business intelligence	0.083	0.218								
Compatibility	0.067	0.241	0.331							
Computer self-efficiency	0.337	0.052	0.437	0.478						
Effort expectancy	0.482	0.703	0.251	0.243	0.231					
Job relevance	0.477	0.227	0.078	0.098	0.077	0.058				
Performance expectancy	0.633	0.464	0.121	0.093	0.133	0.625	0.359			
Social Influence	0.379	0.08	0.561	0.538	0.85	0.368	0.047	0.252		
Trust	0.455	0.266	0.087	0.085	0.188	0.124	0.842	0.197	0.154	

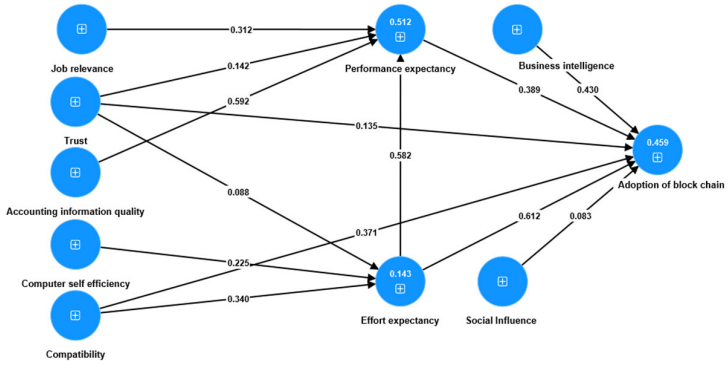

Fig. 2. Path Coefficient and R square

3.5 Structural model

The evaluation of the study's structural model involved the evaluation of the model's predictive power. In the process, coefficient of determinations R2 and significance of path coefficients were evaluated and the results were as displayed by the following Table 4. R2 value obtained was 0.478 and this value was acceptable based on Cohen (1988) who proposed 0.26 as a cut-off value, and so, the study's structural model has reliable predictive power. Meanwhile, the Q2 of the study's dependent variables was larger than 0, denoting an acceptable level of their predictive relevance. Following the recommendation of Hair et al. (2016), a bootstrap procedure was carried out, involving 5,000 resampling – this was to test the study hypotheses. Results displayed in Table 4 demonstrated support for all hypotheses except for H13 which proposed the direct impact of business intelligence and blockchain adoption. Table 4 and Fig. 2 display the outcome of the study hypotheses.

Table 4
Hypotheses Results

Hypotheses	Path coefficient	T Value	P values	Results
Accounting information quality → Performance expectancy	0.592	7.520	0.000	Supported
Business intelligence → Adoption of blockchain	0.430	4.031	0.000	Supported
Compatibility → Adoption of blockchain	**0.371**	**1.204**	**0.229**	**Not Supported**
Compatibility → Effort expectancy	0.340	8.483	0.000	Supported
Computer self-efficiency → Effort expectancy	0.225	4.124	0.000	Supported
Effort expectancy → Adoption of blockchain	0.612	13.315	0.000	Supported
Effort expectancy → Performance expectancy	0.582	11.609	0.000	Supported
Job relevance → Performance expectancy	0.312	7.436	0.000	Supported
Performance expectancy → Adoption of blockchain	0.389	3.244	0.001	Supported
Social Influence → Adoption of blockchain	0.083	5.163	0.000	Supported
Trust → Adoption of blockchain	0.135	3.632	0.000	Supported
Trust → Effort expectancy	0.088	2.50•	0.013	Supported
Trust → Performance expectancy	0.592	4.799	0.000	Supported
Mediation				
Trust → Effort expectancy → Adoption of blockchain	0.128	2.18	0.028	Supported
Trust → Performance expectancy → Adoption of blockchain	0.126	1.98	0.033	Supported
Compatibility → Effort expectancy → Adoption of blockchain	0.169	7.514	0.000	Supported

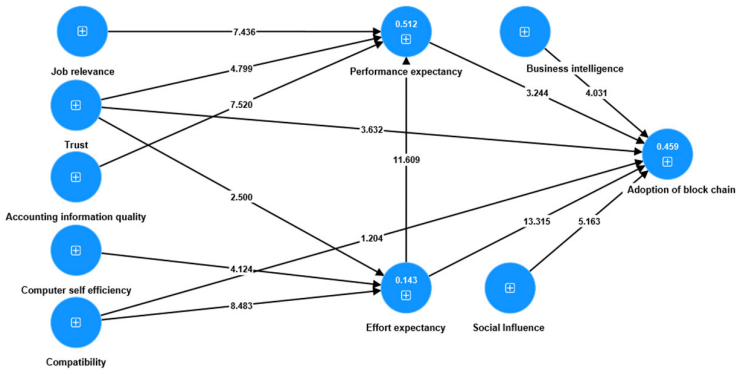

Fig. 3. Hypotheses Results (T values)

4. Discussion

UTAUT has proven to be an appropriate model in this study, and the result supported H2 by showing a positive impact of effort expectancy on blockchain adoption within the accounting domain. The accountant understood the simplicity associated with its usage, and this contributed to the increased popularity of blockchain. The factor of ease of use has a positive impact on blockchain adoption (Davis, 1989; Venkatesh et al., 2003), and finding new technology valuable will increase the possibility of users to use it (Davis, 1989). As explained by Venkatesh et al. (2003), technology use frequency and dependence will increase with the increase of the technology's perceived usefulness, and consequently, increased job performance.

H1 outcome signifies a positive impact of performance expectations on the adoption of block chain. However, in their study involving accountants in Serbian business companies, Milosavljevic et al. (2019) saw no linkage between effort expectations and block chain adoption. A negative linkage between performance expectations and block chain adoption was also discovered. Accountants are the ones responsible in producing financial statements, in addition to handling the ongoing bookkeeping, and accounting data are challenging to manage, understand, and analyze. Clearly, accountants are consistently under a lot of pressure. Hence, blockchain adoption is proven beneficial to accountants, but still, accountants must first learn the use of the technology. In blockchain usage, Milosavljevic et al. (2019) highlighted the need to consider the factor of data security and safety. The findings supported H3 and demonstrated a favorable impact of social influence on blockchain adoption. Some managers and accountants were still learning blockchain because for accountants in Jordan, blockchain is considered a rather new technology. However, the findings showed how social impact affected the accountants' adoption of blockchain technology. In another study by Ferri et al. (2020) involving auditors and blockchain use in auditing, a substantial impact of performance expectancy on blockchain adoption was concluded. Performance expectancy had the biggest impact, followed by effort expectancy and social influence. In Malaysia, Yusof et al. (2018) demonstrated a strong correlation with performance expectations, effort expectations, and blockchain use intention in the financial sector, which is closely related to accounting. UTAUT model clearly has achieved higher saturation level, as can be observed in accounting, auditing, and finance industries, the three industries with close linkage with one another, as evidenced by the near similarity of the study methodology used. There have been studies on blockchain technology usage involving auditors, bank employees and accountants such as Ferri et al. (2020) involving 279 auditors, and Yusof et al. (2018) involving 149 bank employees, and Milosavljevic et al. (2019) involving 85 accountants. The findings supported H9 and demonstrated a considerable positive impact of trust on blockchain adoption. The distributed ledger of the blockchain makes data change impossible, which might deter fraud. All stakeholders taking part in the transaction, for instance, clients, investors, regulators, as well as accountants, benefit from this trait as well (Faccia & Mosteanu, 2019). The usage of blockchain technology may also simplify tasks and increase precision and efficacy (ICEAW, 2018). Also, technology shields accountants from managers' self-serving behaviors and methods of managing their earnings (Sheldon, 2018; Cai, 2021). These advantages of blockchain could boost accountants' trust in the technology and result in a rise in blockchain usage. Hypothesis 12 was not supported because the obtained findings were showing no relationship between compatibility and blockchain adoption. In Jordanian setting, blockchain is still perceived as a foreign technology, and thus, its use is unusual, especially in the accounting industry. Even though the use of compatibility is relevant with blockchain adoption (Pedreo et al., 2021; Cai, 2021), regardless of the potential increase in significance, due to accountants have the knowledge to adopt blockchain technology, the results indicate that compatibility does not necessarily affect blockchain technology usage.

Results demonstrated that effort expectancy had a positive impact on performance expectancy, which means that Hypothesis 4 was supported, and so, the increase in the number of accountants believing that blockchain would perform well will increase the ease of using it. Similar findings were also reported by Buabeng-Andoh and Baah (2020) in their study involving education.

Results showed a considerable impact of trust and quality of accounting information on performance expectations, supporting hypotheses H6 and H7. According to Yermack (2017), the distributed ledger of blockchain technology and the lack of

intermediaries improve the credibility of accounting information. As they do not have to edit or adjust information or double-check financial transactions; such reliability could also help accountants complete their tasks more quickly. Such benefits of blockchain can encourage the accountant to research the technology and, as a result, suggest its use to boost output (ICAEW, 2018).

H8 and H10 were supported by the findings, which indicated a favorable relation between trust, computer self-efficacy, and effort expectations. As a technology, blockchain will be favorable to the firm because it increases the security, transparency, and dependability of economic transactions. Even so, accountants would assume that using blockchain would be simple. However, despite the fact that computers are key tools for accountants, in order to embrace blockchain efficiently, accountants must continually learn to build their self-efficacy in doing so. According to Ferri et al. (2020), computer self-efficacy and effort expectancy are positively correlated.

Considering H11, a weak relationship between compatibility and expected effort was concluded, and this can be attributed to the newness of blockchain in Jordan making this technology foreign to most accountants that they have to learn it first before employing it in their everyday tasks. Compatibility, as highlighted in Peng et al. (2012), encompasses experience and behavior of users during new technology use. Somehow, the use of cloud-based accounting software in Jordan is still uncommon and is more fitting for blockchain (Demirkan et al., 2020).

H5 was supported since the findings indicated a favorable impact of job relevance on performance expectations. The necessity of blockchain technology in accounting has been established; this finding contradicts earlier research. According to Karajovic et al. (2019), blockchain technology usage will not become widespread until 2025. The technology also necessitates using triple-entry bookkeeping, a concept may appear strange to many accountants (Cai, 2021). Moreover, businesses must quickly and precisely manage their enormous and diverse accounting data (Killi, 2019). However, using blockchain necessitates reexamining time-consuming procedures like signature verification and reconciliation techniques (Niranjanamurthy et al., 2019). An additional problem is the larger amount of accounting data, which might be problematic when integrating blockchain into accounting. According to Killi (2019), central databases are faster than blockchains. Further, Ferri et al. (2020) noted a positive correlation between job relevance and performance expectancy - although this was in auditing - showing that performance expectancy of blockchain varies by industry. It is still unknown whether blockchain technology will increase accountants' performance expectations.

Blockchain adoption was also examined in relation to performance and effort expectancy. Results demonstrated that the indirect relationship between trust and adoption of blockchain technology is indirectly mediated by effort and performance expectations. Trust in blockchain encourages accountants to discover how to use it. As Liu and Ye (2021) pointed out, users access blockchain primarily through apps or websites; therefore, giving them extensive and understandable instructions will help them feel comfortable using the technology. Furthermore, accountants think that using blockchain technology will boost their productivity because it will eliminate frequent errors (such as erroneous transactions or quantities of money), misleading data, slow information processing, and delayed publication of financial accounts (ICEAW, 2018). The desire to use blockchain will grow as a result of all of these.

The findings demonstrated that computer self-efficacy and compatibility had an indirect impact on blockchain adoption via effort expectancy. Therefore, in order to enhance their use of blockchain, accountants need to increase their computer self-efficacy. Stated another way, accountants who are proficient in using computer-based accounting software will probably be more likely to adopt blockchain. Additionally, triple-entry accounting is projected to be easy for accountants with double-entry accounting experience to understand because it is similar to double-entry accounting except for the inclusion of blockchain ledgers (Pedreo et al., 2021).

As shown by the results, effort expectancy seemed to mediate the linkage between trust, computer self-efficacy, and performance expectancy, and so, accountants would be more motivated to learn blockchain and employ it in doing their task with the increase in computer self-efficacy and trust towards blockchain. With knowledge in the blockchain-integrated accounting system, accountants could increase their performance. New technology perceived as more efficient and advantageous is more likely to be used (Davis, 1989; Venkatesh et al. (2003). The factors of trust, compatibility, and effort expectancy were included in this study’s research model, and based on the results, two of these factors, namely trust and effort expectancy had a profound impact on adoption, probably because blockchain is a new technology in developing countries like Jordan.

The apparent benefits of blockchain will boost accountants' trust in the technology, raising its level of acceptance. Here, accountants could expect to employ blockchain technology more frequently due to effort and performance expectations (Venkatesh et al., 2003; Ferri et al., 2020). The possible adoption of a new technology is determined by the utility and results that the technology generates, and Jordanian accountants assume that more effort is expected in decision towards the usage or non-usage of blockchain. However, the findings indicated that performance expectancy served as an intermediate.

Before deciding to use blockchain, Buabeng-Andoh and Baah (2020) reported that accountants expected better effort and performance expectancy, or better usability. Clearly, the overall impact level between effort expectations and blockchain adoption is affected by performance expectancy. However, blockchain may not be comprehensively used by accounting

departments or other businesses, because this technology is new. Furthermore, the use of blockchain from potential users cannot be predicted before actual usage, and for accountants, this means unfamiliarity in the use of accounting software built on blockchain. This is the reason why compatibility could not be evaluated.

The position and experience of an accountant was found to have a positive impact on the adoption of blockchain. As stated by Sheldon (2018), the use of conventional accounting for a certain duration will bring awareness to the accountants of its flaws, and blockchain is the solution. Hence, with increased experience in blockchain use in performing their tasks, accountants will have increased intention to use blockchain.

In the accounting domain, the use of blockchain technology is highest among staff accountants and lowest among general and chief accountants. Accountants often have to perform challenging tasks like financial transaction recording and reviewing, among others. They also have to prepare reports promptly. All these tasks can be handled through the use of blockchain, which will allow the accountants to concentrate more on assisting and advising the management (McCallig et al., 2019). Somehow, chief and general accountants have more demanding responsibility as they are the ones to assure that the financial statements prepared for the stock market are accurate. They are also responsible for monitoring the accounting division and governing the tax and audit authorities. Still, blockchain is mostly a theory, and so, its reliability is still unknown (Cai, 2021), and this might factor the low acceptance of this technology among chief and general accountants.

Considering H13, the findings revealed correlation between business intelligence and blockchain adoption and hance, H13 was supported, the study looked at how business intelligence had a stronger effect on the adoption of blockchain since IT companies have advocated using big data analytics to improve and store huge data and information, as discussed by Aydiner et al. (2019). In various industries, blockchain demonstrates its ability to increase business performance (Gunasekaran et al., 2017).

5. Theoretical and Practical Implications

Numerous researchers have investigated the advantages of using blockchain technology for accounting (Wu et al., 2019; Pedreo et al., 2021). Current investigation provided some intriguing results in this regard. First off, according to Venkatesh et al. (2003), effort expectancy rather than performance expectancy, has the biggest impact on users' blockchain adoption. Due to the limited technology development and use in developing countries, accountants seemed to worry more about blockchain's usability than its efficacy.

Considering business intelligence and blockchain as a type of capital plan that impacts a company's performance over time, the study's findings support this notion. Executives of companies wishing to defend their investment in business intelligence might use the study's establishment of a causal link between business intelligence and firm success as a foundation. The study was done to provide this proof. Businesses are recommended to expedite decision-making and take proactive measures to address potential dangers; but, in practice, they apply this strategy as one of several steps that lead to improved company performance through business intelligence investments.

Blockchain usage within the Jordanian setting was examined in this study, and in developing markets like Jordan, as also mentioned in Bonson and Bednarova (2019), blockchain technology is able to increase the accurateness of financial reporting information. Within the accounting domain, the impact of blockchain is positive and this could increase investor confidence which in turn facilitates capital market development (Yermack, 2017). The high level of motivation among accountants in learning and using blockchain demonstrates their strong intent towards adopting this technology. Not only that, blockchain technology allows firms to supersede their competitors, increase their performance, and create groundbreaking new products.

The use of business intelligence solutions like big data analytics, and blockchain technology, results in superior products and services that will fulfill customer satisfaction. Hence, increasing customer satisfaction should be among the major goals of IT managers, as this could increase the company’s financial performance. It is important for managers to seek IT items that specifically cater to their specific needs (George et al. 2014; Orlikowski & Scott 2015). Similar findings were reported in George et al. (2014), Mayer-Schönberger and Cukier (2013), and Orlikowski and Scott (2015).

6. Limitations and Future Research

Some limitations were faced in this study. First off, the sample size was inadequate, which limits the generalizability of the results. Second, even though UTAUT was used to assess blockchain usage intention, this study did not account for the influence of age, gender, or experience. Thirdly, the problems with the organization and the environment were not taken into consideration when examining the advantages of blockchain in accounting. Blockchain is a complicated technology and its application is challenging (Patil & Puranik, 2019). As a result, blockchain adoption will affect a wide gamut of organizational factors, including culture and environment (Tornatzky & Fleischer, 1990). As such, the organizational and environmental elements may have been included in the UTAUT model. Additionally, it is to be predicted that the results are not adequately varied for blockchain usage intention evaluation especially in the accounting setting, given the quantitative approach used in this study. Finally, this study adopted business intelligence and blockchain adoption ratings in accordance with judgements

of people towards the performance of the company. These ratings were established from self-reported evaluations of study respondents – just like in studies on capabilities and strategic management. The findings of this study can be verified through studies that examine the data sources employed by third parties.

7. Conclusions

Through the use of expanded UTAUT, this study presented new outlooks on blockchain technology in the accounting domain. Blockchain technology is proven beneficial to various domains including the domain of accounting but being a fairly new concept in many developing countries especially in Jordan, issues with the accuracy of its financial and accounting data have arisen (Ngo & Le, 2021). Still, accounting data and financial reports can be more accurate with blockchain (Wu et al., 2019; Pedreo et al., 2021). For the context of Jordan, the implementation of blockchain technology into the accounting system Jordanian can be a solution to accounting-related problems. With its ability to improve financial reporting data, the use of blockchain could increase investor confidence globally.

Owing to its affirmed benefits, blockchain adoption within the accounting industry should be accelerated, and this can be achieved through a number of ways. First of all, based on the outcomes from expanded UTAUT, this study deduced that accountants will use blockchain more frequently when they expect that blockchain usage will increase their performance. Secondly, results showed that confidence in blockchain technology and the belief that accounting data become accurate by blockchain implementation will increase the performance expectations of accountants. The major factor influencing blockchain adoption appears to be trust, which will also raise expectations for effort, computer compatibility, and self-efficacy.

References

Abu Afifa, M.M., & Saleh, I. (2022). Management accounting systems effectiveness, perceived environmental uncertainty and companies' performance: the case of Jordanian companies. *International Journal of Organizational Analysis*, *30*(2), 259-288.

Agarwal, R., & Dhar, V. (2014). Big data, data science, and analytics: The opportunity and challenge for IS research. *Information systems research*, *25*(3), 443-448.

Alazab, M., Alhyari, S., Awajan, A., & Abdallah, A.B. (2021). Blockchain technology in supply chain management: an empirical study of the factors affecting user adoption/acceptance. *Cluster Computing*, *24*(1), 83-101.

Albayati, H., Kim, S.K., & Rho, J.J. (2020). Accepting financial transactions using blockchain technology and cryptocurrency: a customer perspective approach. *Technology in Society*, *62*(1), 1013-1033.

Al-Measar, Abdullah Saleh Mohsen. (2015). The Impact of Business Intelligence Usage with the ERP System on the Process of Decision Making: A Study on Telecom, Oil and Gas Companies in Yemen. Ph.D. dissertation, Open University Malaysia, Petaling Jaya, Malaysia.

Al-Mobaideen, H. O. (2014). The impact of change management on the application enterprise resource planning system (ERP) effectiveness: Field study in Jordan Bromine company. *Journal of Management Research, 6*, 79.

Aydiner, A. S., Tatoglu, E., Bayraktar, E., Zaim, S., & Delen, D. (2019). Business analytics and firm performance: The mediating role of business process performance. *Journal of business research*, *96*, 228-237.

Bonson, E., & Bednarova, M. (2019). Blockchain and its implications for accounting and auditing. *Meditari Accountancy Research*, 27(5), 725-740.

Brigham, E.F., & Houston, J.F. (2021). *Fundamentals of Financial Management: Concise, Cengage Learning*. Boston.

Bromiley, P., & Rau, D. (2014). Towards a practice-based view of strategy. *Strategic Management Journal*, *35*(8), 1249-1256.

Buabeng-Andoh, C., & Baah, C. (2020). Pre-service teachers' intention to use learning management system: an integration of UTAUT and TAM. *Interactive Technology and Smart Education*, *17*(4), 455-474.

Cai, C.W. (2021). Triple-entry accounting with blockchain: how far have we come?. *Accounting and Finance*, *61*(1), 71-93.

Calisir, F., Gumussoy, C., & Bayram, A. (2009). Predicting the behavioral intention to use enterprise resource planning systems: an exploratory extension of the technology acceptance model. *Management Research News*, *32*(7), 597-613.

Chen, H., Chiang, R. H., & Storey, V. C. (2012). Business intelligence and analytics: From big data to big impact. *MIS quarterly*, *36*(4), 1165-1188.

Choi, D., Chung, C.Y., Seyha, T., & Young, J. (2020). Factors affecting organizations' resistance to the adoption of blockchain technology in supply networks. *Sustainability, 12*(21), 8882-8919.

Chou, P. (2018). Workplace social support and attitude toward enterprise resource planning system: A perspective of organizational change. *International Journal of Information Systems and Social Change (IJISSC)*, *9*(1), 58-76.

Clohessy, T., & Acton, T. (2019). Investigating the influence of organizational factors on blockchain adoption: an innovation theory perspective. *Industrial Management and Data Systems*, *119*(7), 1457-1491.

Cohen, S. (1988). Perceived stress in a probability sample of the United States.

Cokins, G., Oncioiu, I., Türkeș, M. C., Topor, D. I., Căpușneanu, S., Pașțiu, C. A., ... & Solovăstru, A. N. (2020). Intention to use accounting platforms in Romania: A quantitative study on sustainability and social influence. *Sustainability*, *12*(15), 6127.

Creswell, J. W., Plano Clark, V. L., & Garrett, A. L. (2008). Methodological issues in conducting mixed methods research designs. *Advances in mixed methods research*, *1*(1), 66-83.

Daneshvar Kakhki, M., & Palvia, P. (2016). Effect of business intelligence and analytics on business performance. Paper presented at the Twenty-Second Americas Conference on Information Systems, San Diego, CA, USA, August 11–14.

Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319-340.

Demirkan, S., Demirkan, I., & McKee, A. (2020). Blockchain technology in the future of business cyber security and accounting. *Journal of Management Analytics*, *7*(2), 189-208.

EY. (2017). Blockchain: How This Technology Could Impact the CFO. Available online: https://www.ey.com/cn/zh/industries/ technology/eyhow-blockchain-technology-could-impact-the-cfo (accessed on 13 September 2015).

Faccia, A., & Mosteanu, N.R. (2019). Accounting and blockchain technology: from double-entry to triple-entry. *The Business and Management Review*, *10*(2), 108-116.

Farshidi, S., Jansen, S., España, S., & Verkleij, J. (2020). Decision support for blockchain platform selection: three industry case studies. *IEEE Transactions on Engineering Management*, *67*(4), 1109-1128.

Ferri, L., Spanò, R., Ginesti, G., & Theodosopoulos, G. (2020). Ascertaining auditors' blockchain adoption blockchain technology: evidence from the big 4 accountancy firms in Italy/ *Meditari Accountancy Research, 29*(5), 1063-1087.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*, 39–50. doi: 10.2307/3151312

George, G., Haas, M. R., & Pentland, A. (2014). Big data and management. *Academy of management Journal*, *57*(2), 321-326.

Gomez-Trujillo, A.M., Velez-Ocampo, J., & Gonzalez-Perez, M.A. (2021). Trust, transparency, and technology: Blockchain and its relevance in the context of the 2030 agenda. The Palgrave Handbook of Corporate Sustainability in the Digital Era, Palgrave Macmillan, Cham, pp. 561-580.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice*, *19*(2), 139-152.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European business review*, *31*(1), 2-24.

Hair, Jr, J. F., Sarstedt, M., Matthews, L. M., & Ringle, C. M. (2016). Identifying and treating unobserved heterogeneity with FIMIX-PLS: part I–method. *European business review*, *28*(1), 63-76.

Haleem, A. (2020). Owner manager's acceptance of cloud accounting: an evaluation based on UTAUT model. *Journal of Information Systems and Information Technology* (JISIT), *5* (1), 75-88.

Hindle, G. A., & Vidgen, R. (2018). Developing a business analytics methodology: A case study in the foodbank sector. *European Journal of Operational Research*, *268*(3), 836-851.

ICAEW (Institute of Chartered Accountants in England and Wales) (2018), "Blockchain and the future of accountancy", available at: www.icaew.com/technical/technology/blockchain-andcryptocurrency/blockchain-articles.

Jenkins, J.G., Popova, V., & Sheldon, M.D. (2018). In support of public or private interests? An examination of sanctions imposed under the AICPA code of professional conduct. *Journal of Business Ethics*, *152*(2), 523-549.

Kabir, M.R., & Islam, M. (2021). Application of blockchain for supply chain financing: explaining the drivers using SEM. *Journal of Open Innovation: Technology, Market, and Complexity, 7*(3), 167-197.

Karajovic, M., Kim, H.M., & Laskowski, M. (2019). Thinking outside the block: projected phases of blockchain integration in the accounting industry. *Australian Accounting Review*, *29*(2), 319-330.

Khan, S. (2019). A comparative analysis of emotional intelligence and intelligence quotient among Saudi business students' toward academic performance. *International Journal of Engineering Business Management, 11*, 1847979019880665.

Kilani, Y. M. (2022). The Impact of Human Talent Management Strategies on the Business Intelligence System A Field Study on the Royal Jordanian Airlines. *Journal of Positive School Psychology, 99*, 9605–9614.

Killi, M. (2019). Effects of Blockchain Technology on Accounting and Auditing Profession. Economic and Business Issues in Retrospect and Prospect, IJOPEC Publications, London.

Kim, J. S., & Shin, N. (2019). The impact of blockchain technology application on supply chain partnership and performance. *Sustainability*, *11*(21), 6181.

Kock, N. & Lynn, G. S. (2012). Lateral collinearity and misleading results in variance-based SEM: An illustration and recommendations. *Journal of the Association for Information Systems*, *13*(7), 546- 580.

Kouhizadeh, M., Sarkis, J., & Zhu, Q. (2019). At the nexus of blockchain technology, the circular economy, and product deletion. *Applied Sciences*, *9*(8), 1712.

Krichen, M., Ammi, M., Mihoub, A., & Almutiq, M. (2022). Blockchain for modern applications: A survey. *Sensors*, *22*(14), 5274.

Kumar Bhardwaj, A., Garg, A., & Gajpal, Y. (2021). Determinants of blockchain technology adoption in supply chains by small and medium enterprises (SMEs) in India. *Mathematical Problems in Engineering*, *2021*(1), 1-14.

Lahami, M., Maâlej, A. J., Krichen, M., & Hammami, M. A. (2022). A Comprehensive Review of Testing Blockchain Oriented Software. *ENASE*, *182*, 355-362.

Lee, J.H., & Song, C.H. (2013). Effects of trust and perceived risk on user acceptance of a new technology service. *Social Behavior and Personality: An International Journal, 41*(4), 587-597.

Litke, A., Anagnostopoulos, D., & Varvarigou, T. (2019). Blockchains for supply chain management: Architectural elements and challenges towards a global scale deployment. *Logistics*, *3*(1), 5.

Liu, M., Wu, K., & Xu, J.J. (2019). How will blockchain technology impact auditing and accounting: permissionless versus permissioned blockchain. *Current Issues in Auditing*, *13*(2), 19-29.

Liu, N., & Ye, Z. (2021). Empirical research on the blockchain adoption–based on TAM. *Applied Economics*, *53*(37), 1-13.

Lourenço, I.C., Rathke, A., Santana, V., & Branco, M.C. (2018). Corruption and earnings management in developed and emerging countries. Corporate Governance: *The International Journal of Business in Society*, *18*(1), 35-51.

Maffei, M., Casciello, R., & Meucci, F. (2021). Blockchain technology: uninvestigated issues emerging from an integrated view within accounting and auditing practices. *Journal of Organizational Change Management*, *34*(2), 462-476.

Malik, S., Chadhar, M., Vatanasakdakul, S., & Chetty, M. (2021). Factors affecting the organizational adoption of blockchain technology: extending the technology–organization–environment (TOE) framework in the Australian context. *Sustainability, 13*(16), 9404.

Mayer-Schönberger, V., & Cukier, K. (2013). *Big data: A revolution that will transform how we live, work, and think*. Houghton Mifflin Harcourt.

McCallig, J., Robb, A., & Rohde, F. (2019). Establishing the representational faithfulness of financial accounting information using multiparty security, network analysis and a blockchain. *International Journal of Accounting Information Systems*, *33*(1), 47-58.

Milosavljevic, M., Joksimovic, N. Z., & Milanovic, N. (2019). Blockchain accounting: Trailblazers' response to a changing paradigm. *Economics of Digital Transformation*, *425441*.

Muntean, M., & Cabau, L.G. (2011). Business intelligence approach in a business performance context. *Informatica Economica, 15*. 86–96.

Musa, Z.K.C., Muhayiddin, M.N., Yusoff, M.N.H., Ismail, M., & Muhamad, M. (2019). Intention to use cloud accounting system among SMEs in Malaysia: a conceptual framework of a modified unified theory of acceptance and use of technology (UTAUT) model. *Research in World Economy*, *10*(2), 74-78.

Ngo, D.N.P., & Le, A.T.H. (2021). Relationship between the audit committee and earning management in listed companies in Vietnam. *The Journal of Asian Finance, Economics, and Business*, *8*(2), 135-142.

Niranjanamurthy, M., Nithya, B.N., & Jagannatha, S. (2019). Analysis of blockchain technology: pros, cons and SWOT. *Cluster Computing*, 22(6), 14743-14757.

Obaidat, A.N. (2007). Accounting information qualitative characteristics gap: evidence from Jordan. *International Management Review*, *3*(2), 26-32.

Orlikowski, W. J., & Scott, S. V. (2015). The algorithm and the crowd. *Mis Quarterly*, *39*(1), 201-216.

Patil, S., & Puranik, P. (2019). Blockchain technology. *International Journal of Trend in Scientific Research and Development*, *3*(4), 573-574.

Pedreño, E.P., Gelashvili, V., & Nebreda, L.P. (2021). Blockchain and its application to accounting. *Intangible Capital, 17*(1), 1-16.

Peng, R., Xiong, L., & Yang, Z. (2012). Exploring tourist adoption of tourism mobile payment: an empirical analysis. *Journal of Theoretical and Applied Electronic Commerce Research*, *7*(1), 21-33.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology*, *88*(5), 879.

Qasim, A., & Kharbat, F.F. (2020). Blockchain technology, business data analytics, and artificial intelligence: use in the accounting profession and ideas for inclusion into the accounting curriculum. *Journal of Emerging Technologies in Accounting*, *17*(1), 107-117.

Rahi, S., Ghani, M., Alnaser, F., & Ngah, A. (2018). Investigating the role of unified theory of acceptance and use of technology (UTAUT) in internet banking adoption context. *Management Science Letters*, *8*(3), 173-186.

Rehman Khan, S. A., Yu, Z., Sarwat, S., Godil, D. I., Amin, S., & Shujaat, S. (2022). The role of block chain technology in circular economy practices to improve organisational performance. *International Journal of Logistics Research and Applications*, *25*(4-5), 605-622.

Ringle, C., Da Silva, D., & Bido, D. (2015). Structural equation modeling with the SmartPLS. *Bido, D., da Silva, D., & Ringle, C.(2014). Structural Equation Modeling with the Smartpls. Brazilian Journal Of Marketing*, *13*(2).

Salah, K., Rehman, M. H. U., Nizamuddin, N., & Al-Fuqaha, A. (2019). Blockchain for AI: Review and open research challenges. *IEEE access*, *7*, 10127-10149.

Schreuder, H.T., Gregoire, T.G., & Weyer, J.P. (2001). For what applications can probability and nonprobability sampling be used?. *Environmental Monitoring and Assessment*, *66*(3), 281-291.

Sheldon, M.D. (2018). Using blockchain to aggregate and share misconduct issues across the accounting profession. *Current Issues in Auditing*, 12(2), 27-35.

Tornatzky, L., & Fleischer, M. (1990). *The Process of Technology Innovation*. Lexington Books, Lexington, MA.

Tran, L.T.T., & Nguyen, P.T. (2021). Co-creating blockchain adoption: theory, practice and impact on usage behavior. *Asia Pacific Journal of Marketing and Logistics*, *33*(7), 1667-1684.

Venkatesh, V., & Davis, F.D. (2000). A theoretical extension of the technology acceptance model: four longitudinal field studies. *Management Science*, *46*(2), 186-204.

Venkatesh, V., Morris, M.G., Davis, G.B., & Davis, F.D. (2003). User acceptance of information technology: toward a unified view. *MIS Quarterly, 27*(3), 425-478.

Wong, J., Goh, Q. Y., Tan, Z., Lie, S. A., Tay, Y. C., Ng, S. Y., & Soh, C. R. (2020). Preparing for a COVID-19 pandemic: a review of operating room outbreak response measures in a large tertiary hospital in Singapore. *Canadian journal of anaesthesia*, *67*(6), 732.