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RESEARCH ARTICLE

The Impact of Blockchain Technology on Accounting and Auditing Functions: Evidence from Saudi Arabia

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ABSTRACT

The study investigated the impact of adopting blockchain technology on Saudi organizations' accounting and auditing functions to provide a deep understanding of its benefits and determine the level of awareness of this technology. The study surveyed all theories of adopting Blockchain, such as agency, information, institutional, and network theories. All of these theories confirmed the ability of blockchain technology to minimize costs through transparency, trust, information dissemination, eliminating transaction costs, and smart contracts. The study used the structured questionnaire's primary data and the Alpha Cronbach test to validate the questionnaire's reliability. Using the least square regression models to test the study's hypotheses, the results confirmed that blockchain technology positively and moderately affected the accounting functions, as the adjusted R square recorded 47.9 %. In addition, the results provided reasonable evidence that blockchain technology positively affected auditing functions as the adjusted R square- recorded 60.1 %. The study also confirmed that blockchain technology could significantly enhance Saudi organizations' efficiency, accuracy, and security of financial transactions. In addition, the study confirmed that blockchain technology is a valuable tool for real-time data management and risk reduction, potentially changing the way accounting and auditing work in the future. The study made incremental contributions to the current literature as it confirmed the positive role of blockchain technology in enhancing the quality of accounting and auditing functions. However, applying that technology in Saudi organizations is still early. However, the study provided insightful findings to several stakeholders, including regulators, practitioners, and academics.

1. INTRODUCTION

Digital transformation is no longer an option but a necessity; the world has witnessed a paradigm shift in businesses' operations. The digital economy is burgeoning, with consumers increasingly embracing e-commerce and nations fostering environments conducive to its growth. This trend aligns with the Vision 2030 of Saudi Arabia, which envisions the country's digitalization as a pivotal goal. The commitment to enhance e-commerce is evident in the rising online shopping statistics within the Kingdom, prompting the government to establish the Digital Government Authority to oversee the digital services sector. Therefore, it becomes imperative to explore the role of emerging technologies like the blockchain in reshaping industries. In accounting and auditing, block chain is the beacon of innovation, promising enhanced transparency, security, and efficiency. In today's

rapidly changing business environment, blockchain technology has emerged as one of the most innovative and disruptive forces transforming accounting and auditing work. Blockchain technology is a distributed ledger system that records transactions securely, transparently, and immutably. In addition, Blockchain technology enabled various applications such as smart contracts, digital currencies, supply chain management, and decentralized autonomous organizations (Han et al., 2023)

(Sheela et al., 2023) In Saudi Arabia, more than 50% of organizations plan to adopt blockchain technology in the next three years, and millions of dollars are invested annually to support blockchain development. Blockchain technology is the present feature of accounting and auditing because it offers new opportunities and challenges for the accounting and auditing profession. Blockchain technology can enhance the reliability, timeliness, and accessibility of accounting information and reduce the risks of fraud, error, and manipulation (Dyball et al., 2021). The Blockchain is a distributed ledger endorsed by network participants, which continuously expands as new records are added, encapsulating a wide array of transactions, agreements, and contracts in a peer-to-peer fashion. (Kılınç, 2020) noted that blockchain technology depends on decentralized Distributed Ledger Technology. This framework ensures that once data is created and its authenticity verified, it is cryptographically sealed, rendering it virtually tamper-proof. The blockchain is constructed by sequentially adding data blocks, making it infeasible to alter records (Akdemir, 2018). In addition, (Bellucci et al.,2022) noted that Blockchain technology allows triple-entry bookkeeping, the Unchangeability of transactions, the automating of repetitive tasks that do not require discretionary choices, the representation of cryptocurrencies in financial statements, value-chain management, social and environmental auditing, and reporting and business model innovation. (Yu et al., 2019) noted that Blockchain technology applies in several fields, such as cryptocurrency, stock financing, and corporate governance. Nevertheless, blockchain technology is still early and has several problems, such as limited information confidentiality and regulatory issues. The study recommends using Blockchain technology in the short term to allow firms to disclose information voluntarily. In addition, the application could reduce disclosure and earnings management errors and mitigate information asymmetry in the long term. (Bonsón & Bednárová, 2019) Noted that with the full integration of blockchain technology into the natural accounting ecosystem, there should be a consensus among the regulators, the auditors, and other parties.

Moreover, blockchain fosters a secure, transparent, and accountable digital environment through its trust protocol. In Turkey, blockchain integration into energy systems is underway, with Applications ranging from fault detection in energy grids to cost accounting, billing, and identifying losses and leakages (Büyükarıkan, 2021). Blockchain emerged in 2009 following Satoshi Takemoto's seminal paper "Bitcoin: A Peer-to-Peer Electronic Cash System. However, this work did not explicitly mention blockchain, but it provided insightful explanations and illustrations that lay the groundwork for understanding the architecture of blockchain technology (Kılınc, 2020). Several studies have shown that adopting blockchain technology can affect accounting and auditing practices and standards either positively or negatively As noted by (Yermack, 2017), organizations need to understand the implications of blockchain technology for their accounting and auditing functions if they want to benefit from its potential advantages. The applicable accounting and auditing systems must be compatible with blockchain technology to ensure the information's reliability and validity. Otherwise, some studies showed that blockchain technology could pose new challenges and risks for the accounting and auditing profession regarding regulation, governance, ethics, and education (Han et al., 2023). The Blockchain's advantages in accounting are manifold, enhancing the transparency, security, and efficiency of financial transactions and record-keeping (Ayedh et al., 2021; Mahtani, 2022; Supriadi et al., 2020; Peprah et al., 2022; Bonyuet, 2020). However, different studies have provided mixed findings regarding the impact of blockchain technology on accounting and auditing quality and efficiency (Giang & Tam, 2023). The current study tries to fill the gap in the current

literature as it investigates the impact of blockchain technology on the accounting and auditing functions in Saudi Arabia as a developing county to provide empirical evidence on the benefits and the level of the application of the blockchain technology in the field of accounting and auditing.

2. TYPES AND FEATURES OF THE BLOCKCHAIN NETWORKS

Types Blockchain Networks

Public Blockchains (Open Blockchains) are open networks where anyone can participate without a centralized authority. These blockchains are transparent and immutable, with examples including Ethereum and Bitcoin. Both platforms support intelligent contracts and distributed applications, democratizing the development space for blockchain technology. The second type is Consortium Blockchains, which blend elements of both public and private networks. Pre-selected nodes authorized by designated entities or institutions characterize them. Data within these chains can be public or private. Consortium blockchains are limited to a select group of nodes capable of reading the chain. Collaborative institutions seeking to develop and implement various models commonly utilize them. A prominent example of this type of blockchain is IBM's hyperactive ledger project (Ünal & Uluyol, 2020).

Features of Blockchain Networks

Decentralization, unlike centralized systems where transactions require validation by a third party, such as central banks, blockchain operates without intermediaries. Algorithms within the blockchain to ensure data consistency and mutual agreement among involved parties (Onay, 2021). Another feature is Immutability, as once the transactions added to the blockchain and validated, the transactions become irreversible. In addition, the network can quickly identify and reject invalid transactions. Privacy: Blockchain technology safeguards user privacy by assigning unique addresses that conceal identities, allowing for secure interactions within the network. Auditability, as the blockchain maintains a transparent record of transactions, makes them traceable and verifiable (Kilinc, 2020). Distributed Ledger: The essence of blockchain is its distributed nature, where data is not stored centrally but is recorded, maintained, and updated across multiple locations. Therefore, enhancing security and accessibility (Ünal & Uluyol, 2020).

3. THEORETICAL FOUNDATIONS FOR BLOCKCHAIN TECHNOLOGY

According to Agency Theory (Derbali et al., 2029), the theory is used to detect opportunistic behavior in the cascading Information. In the field of blackchain, (Chang et al., 2019) noted that blockchain technology helps to improve trade contract efficiency. According to the Information theory (Montecchi et al., 2019), blockchain technology provides broad customer access. It also assesses information processing (Martinez et al., 2019). According to Institutional Theory (Ahl et al., 2019)), blockchain technology was used to establish the P2P system analysis framework. (Torres, 2017) noted that Institutions require an institutional environment for public legitimacy. According to Network Theory (Zalan, 2018), the network effect also seems to increase the fast internationalization of blockchain startups. This theory is used to build and design blockchain-based accounting (McCallig et al., 2019). According to Transaction cost analysis (Roeck et al., 2019), blockchain technology can minimize costs through transparency, trust, and disintermediation, and blockchain technology eliminates transaction costs through intelligent contracts (Murray et al., 2019; Torres, 2017). According to the Resource-Based View (Martinez et al., 2019), blockchain technology helps enhance the efficiency of customer orders. It offers a smart contract, which leads to an increase in competencies (Morabito, 2017). The following theories explain the adoption of blockchain technology.

Diffusion of Innovation Theory (Rogers & Cartano, 1962): the theory states that the spread of new ideas in society depends on many factors, including innovation, communication channels, time, and

the social system. According to this theory, potential technology users are divided into the following clusters: innovators, early adopters, initiators, and late majority. Theory of Reasoned Action (Fishbein & Ajzen, 1977): This theory has its roots in societal behavior. According to the theory, individuals' justified actions and attitudes towards the behavior are driven by the behavioral intention, which is linked to the attitude toward the behavior. The behavior of companies is driven by their belief that new technology provides solutions to existing problems and that the behavioral intention is translated into discussions by the top management meetings and the formation of work teams to implement this technology. The Theory of Planned Behaviour (Ajzen, 1991): According to this theory, there is a triad of social factors, cognitive factors, and behavior. For technology, applying personal factors includes evaluating the company's efficiency and comparing it with competitors in the industry. Technical Adoption Model (Davis, 1989): It suggests that the behavioral intention to use a technology that affects the actual use is affected by two constructs: perceived behavior and perceived ease of use (Davis, 1989). The original setting of this theory was a test for the adoption of email services. The perceived usefulness of blockchain will be interoperability, potentially providing a strategic advantage to the firm. Blockchain has proved its utility in financial transactions but has not yet to prove itself around operation issues. The perceived ease of use will include the comfort of a firm with technology and the capability to sustain the change or adoption of blockchain technology. Motivation Model (Davis et al., 1992): The motivation model rests on intrinsic and extrinsic motivations. It states that extrinsic and intrinsic motivation determines the user's behavior. The extrinsic motivation is different from the activity and may be from perceived usefulness and perceived ease of use for technology (Davis et al., 1992). Intrinsic motivation stems from internal satisfaction and pleasure; for computers, (Davis et al. (1992) defined it as the happiness an individual gets by using a computer. The external motivation for blockchain technology will be peer pressure, regulations, the needs of the industry, and requirements from customers. The intrinsic motivation for any firm would be innovation, competitive edge, and value creation. Model of Acceptance with Peer Support (MAPS) (Sykes et al., 2009): according to this theory, in the context of blockchain, performance expectancy will be the confidence that blockchain adoption will gain the objective for which the stakeholders have adopted it. The effort expectancy will imply confidence that the firm can manage and utilize blockchain effectively. In the context of blockchain, social influence is peer pressure, which a firm experiences and confirms, is necessary. The facilitating conditions for blockchain will imply the availability of service providers who assist and guide towards blockchain transformation. Social Cognitive Theory (Bandura, 1986): For blockchain technology, personal factors will include the technical evaluation of the firm in terms of efficiency and comparison to industry standards. Environmental factors will include feedback from value chain partners or customers to adopt it, and behavioral factors, as a result, will include the decision about adoption, the consistency of effort, and the achievement of the desired objective by using blockchain technology.

4. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

4.1The Impact of Blockchain on Accounting

Organizations aiming to integrate blockchain into their accounting practices should develop bespoke blockchain technology to establish a private blockchain network. The following steps explain how blockchain works in accounting. Recording Financial Transactions (Creating Blocks): The blockchain-based accounting system comprises a network of interconnected computers (nodes). The initial step involves recording financial transactions—such as sales, collections, acquisitions, and payments—by adding the transaction details to a new block within the blockchain ledger. Upon creation, the block broadcasts to every node within the network, ensuring that each node maintains an up-to-date copy of the ledger. Verification Process: The system should authenticate each new transaction block, verifying its authenticity and adherence to predefined rules and protocols. This verification process is crucial to maintain the reliability and trustworthiness of the blockchain for

accounting purposes. Consensus Mechanism: the Consensus Mechanism is a distinctive feature of the blockchain as it operates under specific mathematical rules. Nodes compete to add new blocks to the blockchain, with the first successful node earning the right to append the block. This competitive process ensures that no single entity can dominate the blockchain. Financial Reporting and Auditing: By leveraging the blockchain ledger, organizations can generate various financial reports in real-time and at a reduced cost. Auditors access the entire data set, enabling more efficient and thorough audits.

Sheela, et al. (2023) analyzed the scholarly discussion on integrating blockchain technology into the accounting and auditing professions. Based on 67 articles from the Web of Science (WoS) database, the study adopted the Bibliometric and content analysis approach, which used numerical and visualization techniques to examine the extant literature. The study covered the period 2016 and 2022. The study used the Bibliometrix R-package Biblioshiny version to analyze the descriptive analysis, which included publication trends, the most trustworthy sources of scientific publications, prominent scientific authors, prominent documents, and country collaborations. In addition, the study used VOSviewer software Version 1.6.20 for the network visualization of keywords and bibliographic coupling. Leveraging the content analysis, the study revealed three fundamental themes: first, the use of blockchain technology to strengthen financial reporting systems; second, the blockchain technology and the future of auditing; and third, the Valuation of cryptocurrencies. The study explained the gap in the past literature, which included the lack of comprehensive studies on blockchain's regulatory and governance aspects in accounting, insufficient exploration of risks and challenges in adopting new technologies in auditing, and limited understanding of the tax consequences, disclosure requirements, and regulatory frameworks for cryptocurrencies.

(Garanina, et al., 2022) Examined the current trends and analyzed the key research topics and the future of the blockchain as the merging field. The study utilized a structured literature review, citation analysis, topic modeling through machine learning, and a manual review of the selected articles. The study analyzed 153 academic papers from reputable ABS, ABDC, and SSRN journals. The authors focused on the four main areas of research in blockchain for accounting, highlighting that blockchain technology is yet to be a mainstream topic and that most literature is normative. The study identified the changing role of accountants, challenges for auditors, opportunities and obstacles of blockchain technology, and the regulation of crypt assets as the most discussed topics. Despite the disruptive potential of blockchain in accounting and auditing, Accountants may transition to more strategic advisory roles, aligning competitive intelligence with business strategy. At the same time, auditors may be required to verify transactions and ecosystems proactively. (Alkafaji, et al., 2023) explored the influence of blockchain technology on the accuracy of the information in both listed and non-listed companies in Iraq during 2022. The study focused on two main areas: the first part examined the familiarity level of accountants, independent auditors, managers, etc., with blockchain technology, while the second part analyzed the impact of blockchain technology on the quality of accounting information. The study used a sample of 1528 respondents. The findings indicated that familiarity with blockchain technology improved the quality of information in both listed and non-listed companies. Therefore, blockchain technology has had positive and significant effects on the quality of accounting information. This suggested that the influence of Blockchain on accounting information quality is consistent across both listed and non-listed companies in Iraq.

(Zayed, et al., 2023) analyzed the impact of blockchain technology on innovating accountants' skills as a multi-methodology study in the industrial companies listed on the Amman Stock Exchange. The study adopted a multi-method approach using mixed methods between quantitative and qualitative research methodologies by conducting interviews with accountants, auditors, and financial managers, forming a sample of 50 individuals. The results showed that blockchain technology positively affected innovating accountants' skills. (Ibrahim, 2023) analyzed the opportunities and challenges of the applications of blockchain technology in accounting from an international perspective. Then, the study conducted an exploratory study on the application of blockchain

technology in accounting in the Egyptian context. The study used an online survey distributed among networks of accounting academics and practitioners in Egypt to explore their perceptions of the application of blockchain accounting. The results showed that blockchain technology offered many opportunities for the accounting profession but entailed some costs and challenges. Blockchain technology also has different implications for corporate reporting and auditing and national and international accountants. However, the application of blockchain technology is still in its infancy. (Anis, 2023) investigated challenges and unleashing opportunities for digital transformation in Egypt. The study investigated auditors' perceptions about the blockchain in accounting and auditing. The results revealed low-to-moderate awareness of blockchain-based accounting systems. The study provides valuable insights for practitioners, researchers, and policymakers. (Bellucci, et al. 2022) investigated blockchain in accounting practice and research. They discussed the impact of the blockchain on accounting and auditing, crypto assets, finance, and business models. The study highlighted the potential implications for accounting practice and research, including triple-entry bookkeeping, transaction inalterability, automation of repetitive tasks, and representation of cryptocurrencies in financial statements. ICAEW discussed the long-term potential of the blockchain for accountancy, where records could move onto blockchains, allowing real-time transaction checks with certainty over provenance.

(Bellucci et al., 2022) Discussed the impact of blockchain on the accounting and auditing professions, crypto assets, finance, and business models. While the study primarily focused on various aspects of blockchain, it indirectly supported the idea that real-time transactions recorded through blockchain can influence budgeting processes. (Nguyen et al. 2023) examined the impact of blockchain on accounting in the business context. The study emphasized that incorporating blockchain in accounting can optimize information security, safety, and transparency. A feature of blockchain, real-time data tracking, contributed to accurate and up-to-date budgeting. (Elshqirat, 2023) highlighted that while the accounting and auditing standards remained unaffected by the blockchain implementation, the blockchain added risk considerations and controls. (Nguyen, et al., 2023) examined the impact of the blockchain on accounting in the business context. The study emphasized that incorporating blockchain in accounting optimized accounting information's security, safety, and transparency. Real-time data tracking, as a feature of the blockchain, contributed to accurate and up-to-date adjustments. (Elshqirat, 2023) discussed how blockchain eliminated the need to enter accounting information into multiple databases, potentially allowing real-time adjustments and reducing the risk of human error. (Moriggl, et al., 2023) discussed how blockchain technology underlined cryptocurrencies like Bitcoin and Ethereum as the blockchain technology can store data with valuable characteristics, especially for accounting data. In addition, the blockchain provided an uncontested space for records that could be accessed securely. Moreover, blockchain technology ensures data validation. Blockchain technology allows society to keep records that are inviolable and last. While the study did not directly focus on the cryptocurrencies, it highlighted the potential impact of the blockchain on accounting data storage and access. (Bellucci, et al., 2022) We discussed the utilization of the blockchain in accounting practice and research. The study examined various implications of the blockchain for accounting. While not exclusively focused on cryptocurrencies, the article highlighted the inalterability of transactions, the representation of cryptocurrencies in financial statements, and the innovation of business models. (ICAEW, 2017) acknowledged that blockchain could enhance the accounting profession by reducing costs in maintaining and reconciling ledgers. In addition, it provided certainty over the ownership and history of assets, including cryptocurrencies.

Based on the literature review and the study's objective to investigate the reality of application and the level of awareness of the importance and benefits of applying blockchain technology in the Kingdom of Saudi Arabia, the study developed the following sub-hypotheses:

Sub. H 1: Blockchain Technology Affects Accounting In Terms of the Real Time Recording For Transactions.

Sub. H 2: Blockchain Technology Affects Accounting In Terms of the Real-Time Budgeting. Sub.

Sub.H 3: Blockchain Technology Affects Accounting in Real-Time Adjustments.

Sub. H 4: Blockchain Technology Affects Accounting In Terms of the Dealing and Recording of Cryptocurrencies.

4.2 The Impact of Blockchain on Auditing

The auditing process commences with a meticulous review of the transaction records, which form the basis of the financial statements. This initial phase is often extensive and demanding (Gulp, 2019). As businesses grow and activities expand, the necessity for external financing emerges, compelling companies to establish trust with capital providers to minimize their cost of capital. These providers, encompassing lenders and investors, rely on financial data to assess the company's financial health and the security of their invested capital. Auditors, in turn, must conduct their duties by established auditing standards, exercising due care and diligence. Auditors provide reasonable assurance that the company's financial statements adhere to the applicable accounting principles and standards, accurately reflect the company's financial status, and that an effective internal control system is in place (Kılınç, 2020). Therefore, auditors can benefit from applying Blockchain technology in the auditing profession. Some previous studies showed that it significantly affected the auditing profession by streamlining the monitoring and control processes, attributed to the data's reliability, transparency, and prompt availability (Cagle, 2020). The real-time audit trails facilitated by the blockchain allowed auditors to allocate more time to other critical aspects of the audit, such as evaluating internal controls rather than verifying transaction authenticity.

Moreover, auditors can expedite their traditional techniques. For instance, during verification, auditors can swiftly send documents to clients or associated banks and proceed based on the feedback received. In addition, the blockchain's decentralized nature aided in detecting or preventing fraudulent financial reporting (Kılınç, 2020). It fortified the audit trail by employing the network of databases, ensuring continuity even if one database encounters issues, as others automatically synchronize and rectify any discrepancies. (Alshhadat, 2023) examined the challenges companies operating in the Gulf Cooperative Council Countries (GCC) face in adopting blockchain technology. The study used the qualitative approach to understand the phenomenon. Accordingly, the study conducted 38 interviews with experts, business senior managers, professionals, and analysts to investigate the reasons behind the reluctance of GCC companies to adopt blockchain technology. The study contributed to the theory by concluding some fascinating information that facilitated the understanding of the challenges that prevent companies operating in the GCC region from benefiting from blockchain technology. These come under three dimensions: cultural reasons, economic feasibility, and vagueness of the regulatory environment of blockchain technology and its future.

(Han, et al., 2023) investigated the impact of the blockchain on enhancing transparency and trust in accounting practices and utilizing blockchain data to make better decisions. The blockchain data is characterized by immutability, append-only, shared, verified, and agreed-upon data, and the validation of blockchain protocols by multiple parties provided real-time trusted data for the artificial intelligence systems used by auditors, improving assurance and efficiency. This review highlighted four key themes from the literature, focusing on how blockchain has transformed record keeping in accounting: an event-based approach to accounting, real-time accounting, triple-entry accounting, and continuous auditing. The study used the agency theory and stakeholder theory to interpret the findings. The investigation outlined the challenges and reasons organizations should exercise caution when adopting blockchain. (Silva, et al., 2021) They evaluated the current stage of blockchain technology in auditing by analyzing the scientific publications and identifying the impact

of what is already a reality and the potential implications for the audit profession. The study considered the proposals and suggestions on the leading research indexed by the Scopus and Web of Science databases. The study analyzed 374 papers and provided a summary and analysis of the current state of the auditing research. The study used bibliometric analysis using the bibliometric R Package and the VOSviewer software. After a systematic study of abstracts and a general review of the papers, the study found 78 papers relevant to the study scope. The results revealed several new challenges regarding the skills and knowledge needed in this new reality of audit professionals.

(Hashem, et al., 2023) examined how Blockchain technology affected the audit process quality as they conducted an empirical study using a sample of the Egyptian banks that used blockchain technology for 2017- 2021. The Conceptual Framework and the Literature Review concluded that blockchain technology could affect audit firms at six key levels. Blockchain technology offers several advantages for auditors. Firstly, it enabled them to save time and enhance the efficiency of their audits. Secondly, it allowed for an audit of the entire population rather than relying on sampling techniques. Thirdly, auditors can focus on testing controls rather than individual transactions. Additionally, the blockchain facilitated the establishment of the continuous audit process. Moreover, auditors can assume a strategic role in the audit process. Lastly, the blockchain opened up opportunities for auditors to develop new advisory services. Furthermore, the empirical study showed a significant relationship between the blockchain and audit quality in the banking sector. The findings emphasized the necessity of implementing a well-defined and consistent legal framework and updated auditing standards, enabling auditors to integrate this technology and improve their auditing methodologies. (Lombardi, et al., 2022) discovered that auditing professionals could use blockchain to enhance business information systems, saving time and preventing fraud. Secondly, smart contracts enable audit efficiency, facilitating improved reporting, disclosure, and transparency. Lastly, the study highlighted the potential of cryptocurrency and initial coin offerings in fostering corporate governance and providing new avenues for venture financing. These findings shed light on the transformative potential of these technologies in auditing and have wide-ranging implications for both practical application and theoretical understanding. (Singh, et al., 2023) found that the innovation and ensuing disruption of Blockchain technology is still in an emerging phase, particularly the scope and the influence in accounting, auditing, finance practice, and research. Key stakeholders involved in the accounting and auditing domain can use the findings.

(Yermack, 2017) discussed the implications and challenges of blockchain technology in accounting and auditing practices. (Rijanto 2024), noted that the stakeholders tend to evaluate the quality and efficiency of the accounting and auditing information based on the blockchain technology's security, transparency, and immutability. Many studies have been conducted to determine how blockchain technology influences the accounting and auditing processes and outcomes. For instance, (Elommal, 2022) noted that blockchain technology adoption could affect the financial statement audit, introduce new assurance services, and create new roles for the auditors in the blockchain ecosystem. The study showed a positive relationship between the adoption of blockchain technology and the quality and efficiency of accounting and auditing. (Gökoğlan, et al., 2022) Revealed that organizations believed that blockchain technology could enhance their accounting and auditing operations and reduce costs and risks compared to traditional methods. This is because blockchain technology is associated with reliability, timeliness, and accessibility of accounting and auditing information and evidence. Also, this was supported by (Basiouni, 2022), who found that Saudi Arabian organizations are willing to adopt blockchain technology in their accounting and auditing functions in the next three years and have invested millions of dollars to support blockchain development. However, researchers such as (Anis, 2023) argued that blockchain technology does not always result in success. In addition, (Yermack, 2017) found that blockchain technology is still in its early stages and faces many technical and social barriers to its widespread adoption and implementation. (Akter, et al.,

2020) Noted that trends supporting digital transformation facilitate the adoption and implementation of blockchain technology.

Based on the literature review and the study's objective, the study developed the following sub-hypotheses:

Sub. H. 1: Blockchain Technology Affects Auditing In Terms of Facilitation of Certification Services.

Sub. H.2: Blockchain Technology Affects Auditing In Terms of the Real Time Audit.

Sub. H.3: Blockchain Technology Affects Auditing In Terms of the Effective Supersession

Sub. H.4: Blockchain Technology affects auditing by reducing risk in transactions.

5. METHODOLOGY AND ANALYSIS OF RESULTS

5.1 Research Method

The current study used the primary data collected by the structured questionnaire, delivered online via Google Forms, allowing participants to fill it out quickly and making the results immediately available. The study used a sample of 131 participants out of 200 questionnaires sent to the target participants as a representative sample of the study's community in Saudi Arabia. The data were analyzed using regression models to test the study's hypotheses.

5.2 Analysis of Results

The Reliability of the Study Tool

The study conducted the internal consistency test to verify the reliability of the study tool (questionnaire). Table (1)) Shows that all coefficients exceeded 60% for all paragraphs of the questionnaire. This indicated that the degree of stability of the study tool is high; therefore, we can rely on the study tool.

Table (1): Alpha Cronbach Test

Number	Variable	No. of Questions	Alpha Value
1	Implementing Blockchain in Accounting	5	0.841
2	Implementing Blockchain in Auditing	5	0.847
3	Real-Time Recording	3	0.821
4	Real-Time Budgeting	3	0.853
5	Real-Time Adjustments	3	0.834
6	Cryptocurrencies Accounting	3	0.800
7	Facilitation of Certification Services	3	0.845
8	Supervision	3	0.877
9	Real-Time Audit	3	0.865
10	Transaction Risk	3	0.827
11	Total	34	0.964

Table (2) shows the demographic Analysis as 84 males participated in the questionnaire while 47 females participated.

Table (2): Gender

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Female	47	35.9	35.9	35.9
Male	84	64.1	64.1	100.0
Total	131	100.0	100.0	

Table (3) shows that most participants came in the category of 25-39 years, 51.9% of the total participants, while the lowest participation came in the category of 50 years and over by 2.3% of the total number of participants.

Table (3): Age

Age	Frequency	Percent	Valid Percent	Cumulative Percent
25 to 39 Years	68	51.9	51.9	51.9
40 to 49 years	18	13.7	13.7	65.6
50 years and over	3	2.3	2.3	67.9
	32.1	32.1	100.0	100
Total	131	100.0	100.0	

Table (4) shows that 62.2% of the participants held bachelor's degrees. Those who held Master's Degrees came in second place, 23.7% of the total participants, while those getting a PhD degree reached 6.1%.

Table (4) Education

Education	Frequency	Percent	Valid Percent	Cumulative Percent
Bachelor degree	82	62.6	62.6	62.6
Less than Bachelor	10	7.6	7.6	70.2
Master Degree	31	23.7	23.7	93.9
PHD degree	8	6.1	6.1	100.0
Total	131	100.0	100.0	

Table (5) showed that the Majority of the participants came from the category of 5 to 14 years of experience, recording 42.7%. In second place came under five years of experience, recording 35.1%. Finally, in last place came the category of 25 years of experience, recording 4.6 %.

Table (5) Experience

Years of expertise	Frequency	Percent	Valid Percent	Cumulative Percent
15 to 24	23	17.6	17.6	17.6
25 and over	6	4.6	4.6	22.1
5-14	42.7	42.7	64.9	
Under 5 years	46	35.1	35.1	100.0
Total	131	100.0	100.0	

Testing Hypotheses

Sub. H 1: Blockchain Technology Affects Accounting In Terms Of Real Time Recording For Transactions.

Table (6) showed that the model was statistically significant, as the F test recorded 63.251. According to the Adjusted R Square, the model explained 32.4% of the changes in the dependent variable. The t-test results confirmed that blockchain technology statistically positively affected accounting regarding real-time transaction recording. Therefore, the study accepted the alternative hypothesis.

Table (6): Model Summary and ANOVA Analysis

R	R Square	Adjusted R Square	Std. Error of the Estimate		
.574	.329	.324	.538		
	Sum of Squares	Df	Mean Square	F	Sig.
Regression	18.281	1	18.281	63.251	.000
Residual	37.283	129	.289		
Total	55.564	130			
	Beta	t	Sig.		
Blockchain_Accounting	.574	7.953	.000		
Constant		6.558	.000		

Sub. H 2: Blockchain Technology in business affects accounting regarding real-time budgeting.

Table (7) showed that the model was statistically significant, as the F test recorded 50.606. According to the Adjusted R Square, the model explained 27.6% of the changes in the dependent variable. The t-test results confirmed that Blockchain Technology had a statistically positive impact on accounting regarding real-time transaction recording. Therefore, the study accepted the alternative hypothesis.

Table (7): Model Summary and ANOVA Analysis

R	R Square	Adjusted R Square	Std. Error of the Estimate		
.531	.282	.276	.582		
	Sum of Squares	Df	Mean Square	F	**Sig.**
Regression	17.138	1	17.138	50.606	.000

Residual	43.688	129	.339		
Total	60.826	130			
	Beta	T	Sig.		
Blockchain_Accounting	.531	7.114	.000		
Constant		5.969	.000		

Sub. H 3: Blockchain Technology Affects Accounting In Terms of Real-Time Adjustments.

Table (8) showed that the model was statistically significant, as the F test recorded 80.522. According to the Adjusted R Square, the model explained 38% of the changes in the dependent variable. The t-test results confirmed that Blockchain Technology had a statistically positive impact on accounting regarding real-time transaction adjustments. Therefore, the study accepted the alternative hypothesis.

Table (8): Model Summary and ANOVA Analysis

R	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**		
.620	.384	.380	.533		
	Sum of Squares	Df	Mean Square	F	Sig.
Regression	22.883	1	22.883	80.522	.000
Residual	36.659	129	.284		
Total	59.542	130			
	Beta	t	Sig.		
Blockchain_Accounting	.620	8.973	.000		
Constant		5.610	.000		

Table (9) showed that the model was statistically significant as the F test recorded 53.206. According to the Adjusted R Square, the model explained 28.7% of the changes in the dependent variable. The test results confirmed that blockchain technology statistically affected accounting regarding cryptocurrency dealing and recording. Therefore, the study accepted the alternative hypothesis.

Table (9) Model Summary and ANOVA Analysis

R	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**		
.540	.292	.287	.670		
	Sum of Squares	Df	Mean Square	F	Sig.
Regression	23.909	1	23.909	53.206	.000
Residual	57.968	129	.449		
Total	81.876	130			

	Beta	t	Sig.
Blockchain_Accounting	.695	10.980	.000
Constant		7.543	.000

Main H1: Blockchain Technology Affects Accounting.

Table (10) showed that the model was statistically significant as the F test recorded 53.206. According to the Adjusted R Square, the model explained 47.9 % of the changes in the dependent variable. The t-test results confirmed that Blockchain Technology had an overall statistically positive impact on the accounting functions. Therefore, the study accepted the alternative main hypothesis.

Table (10): Model Summary and ANOVA Analysis

R	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**		
.695	.483	.479	.412		
	Sum of Squares	Df	Mean Square	F	Sig.
Regression	20.450	1	20.450	120.564	.000
Residual	21.881	129	.170	21.881	
Total	42.331	130			
	Beta	t	Sig.		
Blockchain_Accounting	.695	10.980	.000		
Constant		7.543	.000		

Sub. H 1: Blockchain Technology Affects Auditing In Terms of Facilitation of Certification Services.

Table (11) showed that the model was statistically significant; the F test recorded 127.942. According to the Adjusted R Square, the model explained 49.4 % of the changes in the dependent variable. The test results confirmed that blockchain technology had a statistically positive impact on auditing in terms of facilitating certification services. Therefore, the study accepted the alternative hypothesis.

Table (11): Model Summary and ANOVA Analysis

R	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**		
.706	.498	.494	.494		
	Sum of Squares	Df	Mean Square	F	Sig.
Regression	31.188	1	31.188	127.942	.000
Residual	31.446	129	.244		

Total	62.634	130			
	Beta	t	Sig.		
Blockchain_Auditing	.706	11.311	.000		
Constant		2.323	.022		

Sub. H 2: Blockchain Technology Affects Auditing In Terms of Effective Supervision.

Table (12) showed that the model was statistically significant as the F test recorded 81.648. According to the Adjusted R Square, the model explained 38.3 % of the changes in the dependent variable. The t-test results confirmed that blockchain technology had a statistically positive impact on supervision in auditing. Therefore, the study accepted the alternative hypothesis

Table (12): Model Summary and ANOVA Analysis

R	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**		
.623	.388	.383	.577		
	Sum of Squares	Df	Mean Square	F	Sig.
Regression	27.207	1	27.207	81.648	.000
Residual	42.985	129	.333		
Total	70.192	130			
	Beta	t	Sig.		
Blockchain_Auditing	.623	9.036	.000		
Constant		2.568	.011		

Sub. H 3: Blockchain Technology Affects Auditing In Terms Of Real-Time Audit.

Table (13) showed that the model was statistically significant, as the F test recorded 100.861. According to the Adjusted R Square, the model explained 43.4 % of the changes in the dependent variable. The t-test results confirmed that blockchain technology had a statistically positive impact on real-time auditing. Therefore, the study accepted the alternative hypothesis.

Table (13): Model Summary and ANOVA Analysis

R	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**		
.662	.439	.434	.532		
	Sum of Squares	Df	Mean Square	F	Sig.
Regression	28.585	1	28.585	100.861	.000
Residual	36.560	129	.283		
Total	65.145	130			

	Beta	t	Sig.
Blockchain_Auditing	.662	10.043	.000
Constant		2.669	.009

Sub. H 4: Blockchain Technology Affects Auditing In Terms of Reduction in Transaction Risk.

Table (14) showed that the model was statistically significant as F test recorded 151.258. According to Adjusted R Square, the model explained 53.6 % of the changes in the dependent variable. The t-test results confirmed that blockchain technology had a statistically positive impact on auditing in terms of reduction in transaction risk. Therefore, the study accepted the alternative hypothesis

Table (14): Model Summary and ANOVA Analysis

R	**R Square**		**Adjusted R Square**	**Std. Error of the Estimate**		
.735	.540		.536	.427		
	Sum of Squares		Df	Mean Square	F	Sig.
Regression	27.634		1	27.634	151.258	.000
Residual	23.567		129	.183		
Total	51.201		130			
	Beta		t	Sig.		
Blockchain_Auditing	.735		12.299	.000		
Constant			3.364	.001		

Main Hypothesis 2: Blockchain Technology Affects Auditing

Table (15) showed that the model was statistically significant, as the F test recorded 197.090. According to the Adjusted R Square, the model explained 60.1 % of the changes in the dependent variable. The t-test results confirmed that Blockchain Technology had an overall statistically positive impact on auditing in terms of reducing transaction risk. Therefore, the study accepted the alternative main hypothesis.

Table (15): Model Summary and ANOVA Analysis

R	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**		
.777	.604	.601	.381		
	Sum of Squares	Df	Mean Square	F	Sig.
Regression	28.633	1	28.633	197.090	.000

Residual	18.741	129	.145		
Total	47.374	130			
	Beta	t	Sig.		
Blockchain_Auditing	.777	14.039	.000		
Constant		3.600	.000		

6. DISCUSSION AND CONCLUSION

The current study aimed to investigate the influence of blockchain technology on accounting and auditing functions in Saudi organizations. The study used primary data collected by the questionnaire tool as 130 individuals from diverse accounting and auditing organizations working in Saudi Arabia participated. The study used the least square regression models to test the study's hypotheses. Based on the past literature, the study developed main and sub-hypotheses to investigate the influence of blockchain technology on accounting and auditing functions. The study conducted the Alpha Cronbach Test to ensure the reliability of the questionnaire's questions before testing the hypotheses, as the Alpha Cronbach Test recorded 96.4 %, which is greater than 60%. That is, the construct of the study is reliable. The study's results confirmed that blockchain technology had moderate impacts on the accounting functions regarding real-time recording for Transactions, real-time budgeting, real-time adjustments, and cryptocurrency dealing and recording, as the adjusted R squared recorded 32.4%, 27.6 %, 38%, and 28. 7 %, respectively. However, when all variables were included in the regression model, blockchain technology had a collective impact of 47.9 %. In addition, the study's results confirmed that blockchain technology had moderate impacts on auditing. As for the impact of blockchain on auditing, namely facilitation of certification Services, supervision, real-time audit, and reduction risk in the transaction, the adjusted R squared recorded 49.4 %, 38.3 %, 43.3%, and 53.6 %, respectively. However, when all variables were included in the regression model, blockchain technology had a collective impact of 60.1 %. The effects of blockchain technology on the auditing functions were more significant than the impact of blockchain technology on the accounting functions as per the adjusted R square static. The results of the current study confirmed the results of some previous studies such as (Ayedh et al., 2021; Mahtani, 2022 Supriadi et al., 2020 Peprah et al., 2022; Bonyuet, 2020; Kabir et al., 2022) as these studies confirmed the positive impact of the blockchain technology on the accounting and auditing from different perspectives. In addition, the study's results will provide useful insights to several stakeholders, including but not limited to accountants and internal and external auditors, on the advantages of blockchain technology and the level of awareness of this technology in Saudi Arabia, as the awareness is still insufficient. The study discussed theories of blockchain technology, such as information theory, agency theory, institutional theory, and network theory that help understand the advantages and motivations behind applying blockchain technology.

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Appendixes

First Section: Demographic Information Survey Questions

Section one: Demographic Information				
What is your Gender	Male	Female		
How old are you	Under 25 Years	25 to 39 Years	40 to 49 years	50 years and over.
What is your education level?	Less than Bachelor	Bachelor degree	Master Degree	PHD degree
What is year of work Experience?	Under 5 years	5 to 14 years	15 to 24 years	25 years and over

Second Section: Independent Variable Measures: (Implementing Blockchain in Accounting)

No	Question	5 Likert Scale				
		Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
1	Implementing blockchain technology can enhance financial ntransparency in Accounting processes.					
2	blockchain technology can improve the accuracy of financial reporting in accounting systems					
3	Blockchain adoption will affect the Efficiency of auditing procedures in accounting.					
4	Blockchain can streamline reconciliation Processes in accounting.					
5	Blockchain-based smart contracts can enhance contract management efficiency in financial transactions.					

Third Section: Independent Variable Measures: (Implementing Block chain in Auditing)

No	Question	5 Likert Scale				
		Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
1	Blockchain technology will revolutionize audit trail management in auditing practices.					
2	Blockchain can enhance the reliability of audit evidence.					

3	Blockchain adoption will improve the Detection of fraudulent activities during audits.					
4	blockchain can improve the traceability of audit evidence during the auditing process					
5	blockchain adoption will lead to more effective fraud detection mechanisms in auditing practices					

Fourth Section: Dependent Variable Measures for H1:

No	**Question**	**5 Likert Scale**				
		Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
Real-Time Recording for Transactions						
1	real-time transaction recording for ensuring accurate financial data in organizations					
2	real-time transaction recording can reduce errors and discrepancies in financial records					
3	real-time recording can enhance decision- making based on up-to-date financial information					
Real-Time Budgeting						
1	real-time budgeting for organizations in terms of financial planning and control					
2	real-time budgeting can improve resource allocation and cost management					
3	real-time budgeting can enhance organizational agility in responding to financial changes					
Real-Time Adjustments						
1	real-time adjustments for maintaining accurate financial statements					
2	real-time adjustments can prevent financial misstatements and errors					
3	real-time adjustments can improve financial decision-making					

Cryptocurrencies Dealing and Recording						
1	cryptocurrencies will become a standard form of payment and financial transactions					
2	recording cryptocurrency transactions accurately is essential for financial transparency					
3	organizations can effectively manage the risks associated with dealing in cryptocurrencies					

Fifth Section: Dependent Variable Measures for H2:

No	**Question**	**5 Likert Scale**				
		Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly disagree**
Facilitation of Certification Services						
1	Certification services in ensuring the integrity and security of blockchain-based transactions is valuable.					
2	Services can enhance trust in blockchain Systems.					
3	certification services can effectively verify the authenticity of blockchain records					
Supervision of All Transactions						
1	continuous supervision of blockchain transactions to prevent fraudulent activities					
2	transaction supervision can enhance the reliability of blockchain networks					
3	effective supervision can mitigate risks associated with unauthorized transactions					
Real-Time Audit						
1	real-time audit capability ensuring the accuracy and reliability of financial information					
2	real-time audit can improve fraud detection and prevention					

3	real-time audit practices can enhance organizational governance and compliance					
Reduction in Transaction Risk						
1	adopting blockchain technology reducing transaction risk for organizations					
2	blockchain can effectively reduce transaction risk compared to traditional systems					
3	organizations can successfully manage transaction risk in a blockchain environment					