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Exploring Blockchain Implications for Accounting and Auditing in Iraq: Expert Insights on Opportunities and Preparedness

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Abstract. This qualitative study explores the potential of blockchain technology in accounting and auditing within the Iraqi context, elucidating applications, trends, and challenges through expert interviews and literature analysis. Findings reveal that increasing digitization makes blockchain promising for financial transactions, recordkeeping, smart contracts, and auditing efficiency. However, lack of understanding, regulatory ambiguity, resource barriers, and ethical risks necessitate greater organizational preparation. As one of the first studies investigating blockchain implications for Iraqi accountants, these timely insights urge businesses, academics, and policymakers to actively upskill, legislate, and collaborate for secure technological integration.

Keywords: Exploring, Leveraging, Accounting, Auditing, Futures, Convey the Qualitative.

1. Introduction

Technology development so rapidly brings up diverse innovations in the era of revolution in Industry 4.0, influencing all aspects of life. The blockchain design was first applied to the world's Bitcoin. However, industrial fields, from the financial sector to supply chains, the public sector, intellectual property management, and others, can utilize the blockchain paradigm and design. Appelbaum D. and Stein Smith S. (2018) revealed that the biggest manifestation of blockchain technology that is best known to society today is Bitcoin. In the Harvard Business Review, Lansiti and R. Lakhani (2017) stated that Bitcoin represents the initial implementation of blockchain technology, utilizing a peer-to-peer network layered on top of the Internet. It serves as a virtual currency system that eliminates the need for a central authority, facilitates ownership transfers, and verifies transactions.

In this regard, Murray (2019) and Arun, Cuomo, and Gaur (2019) explain blockchain technology as a decentralized ledger technology that provides a trusted platform that is secure for digital recording. Thus, blockchain technology eliminates the need for process validation and expensive third-party verification. This technology eliminates intermediary transactions and has the potential to provide an efficient and economical flow of goods and services. Thakur M. (2017) and Miller et al. (2019) also argue that the blockchain system supports more transparent, accountable, safe, fast, efficient, and effective transactions and can replace the bookkeeping function of the Lot of System Accountancy. Figure 1 below illustrates the difference between a distributed ledger and a traditional database. A distributed ledger is a ledger or database that is decentralized, that is, spread across many computers or nodes. In this technology, each node will maintain the ledger, and if there is a change in data, the ledger will also be updated; thus, the data updates occur independently on each node. In fact, traditional databases have a centralized form. It also takes time, costs money, and has potential vulnerabilities for hacking.

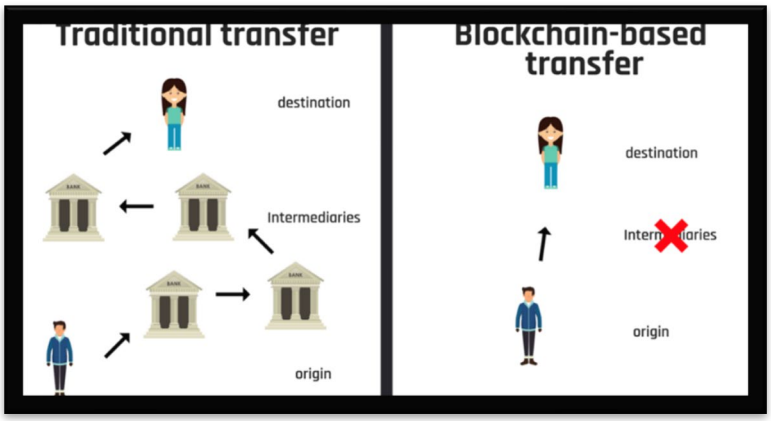

Fig. 1: Traditional Databases Vs. Distributed Ledgers
Source: Taken from gendal.me.

Blockchain technology can potentially turn the tide on entire industries, including the financial sector, with its disruptive potential (Deloitte 2016). Blockchain may pose a major future threat to the payments industry and will ultimately disrupt traditional payment systems (Chen et al. 2019: 2089). Experts predict that blockchain has the potential to achieve large-scale success in the financial sector, including banking, internet finance, capital markets, and other related matters (Xu et al. 2019). In an article (Financial Executives Research Foundation 2018), In the industrial era 4.0, accountants, academics, and practitioners need to consider the power of this disruptive blockchain technology in the future. Although blockchain is still in the early stages of development, it is essential to see the potential and opportunities in the future. Many observers and industry professionals predict it will not be long before blockchain becomes the industry standard in accounting. Additionally, as this transformational technology matures, major opportunities emerge. Considering how blockchain will be used and developed on a large scale, it is therefore crucial to look at it.

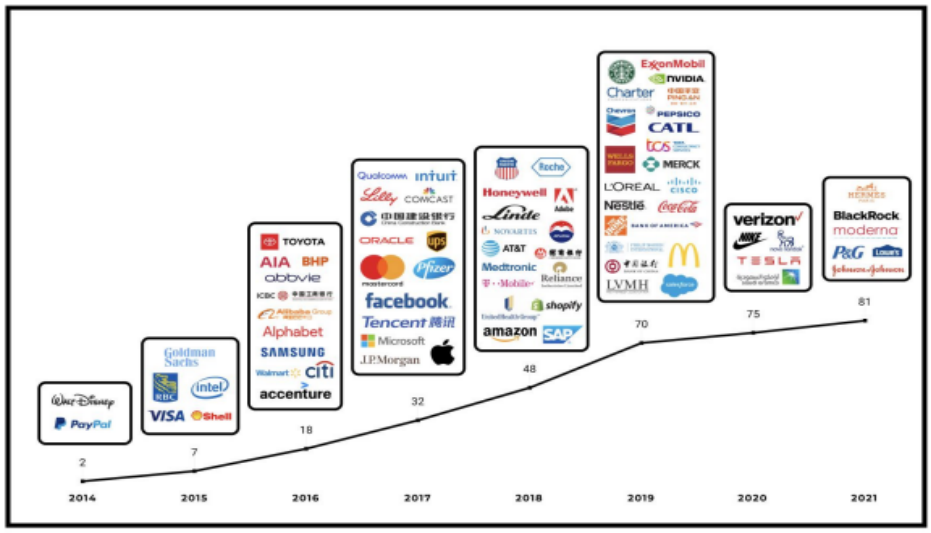

Fig. 2: Year of Blockchain Entry for the Top 100 Public Companies
Source: theblockchaintest.com

Consequently, some top institutions began engaging in blockchain as early as 2014, with PayPal and Walt Disney being the earliest entrants. 2016 saw 16 top companies enter the blockchain space, and 2019 saw the most entrants with 22 companies. Moreover, the understanding and literature regarding blockchain are not yet widely understood in the Iraqi business environment. However, accounting in Iraq is still limited in scope, while the potential for future disruption is enormous and requires further investigation. The "Blockchain Technology in Accounting and Auditing: Trends, Challenges, and Future" research identifies a notable gap in the existing literature regarding the nuanced exploration of challenges and potential developments in integrating blockchain technology within accounting and auditing. While existing studies acknowledge the transformative potential of blockchain in these fields and document emerging trends, there remains a need for an in-depth analysis of the specific challenges faced by practitioners during implementation. Furthermore, blockchain technology's future implications and trajectories in reshaping traditional accounting and auditing practices have not been comprehensively addressed. This research aims to bridge this gap by delving into the intricacies of challenges encountered in real-world applications and offering insights into the prospective evolution of blockchain within the accounting and auditing domains.

Based on the background described above, this research aims to describe the development and system of blockchain, identify the potential use of blockchain in various fields, especially accounting, analyze internal and external factors in the use of blockchain technology, and finally, answer the research question “How accountants handle potential future blockchain disruptions.” This research is expected to contribute to developing knowledge materials for academics and practitioners while also serving as a reference for further research on blockchain technology, which is still unexplored in Iraq. The structure of this study is the Introduction, literature, methodology, results, and conclusion.

2. Research Literature

Blockchain is a decentralized electronic ledger system that creates a secure and immutable cryptographic record of every value transaction, whether money, goods, property, employment, or voice. A blockchain is also defined as a chain of blocks that stores transaction information through a network of computers called nodes. Nodes are computers connected to a blockchain network and are responsible for acting as communication points that can perform various functions. All nodes contain the same transaction history, which makes blockchain a decentralized system as there is no central control point. A group of researchers first outlined blockchain technology in 1991. Blockchain technology enables

peer-to-peer payments, record management, physical object tracking, and token transfer via smart contracts, potentially revolutionizing human transactions (PWC 2018). Blockchain is "a digital mechanism for creating a distributed digital ledger, where two or more participants in a peer-to-peer network can exchange information and assets directly without needing a trusted intermediary" (Furlonger & Uzureau 2020). In P2P networks, blockchain makes it easier to access funds safely, transparently, and quickly without more complicated and expensive bank procedures (Dai J. & Vasarhelyi M. A. (2017) and Sangwan et al. (2020)). CPA Canada (2017) states that all participants in the network utilize a shared database connected to the blockchain, with each participant storing an identical copy of the ledger.

Likewise, each entry in the blockchain is a transaction representing a token of exchange between participants. It is an asset representing a right, obligation, or ownership. As Swan (2015) quoted, blockchain has been a revolution, which is categorized into three. Blockchain 1.0 focuses on currency and the spread of cryptocurrencies in cash-related applications, such as currency transfers (remittances) and digital payment systems. Blockchain 2.0 is the development of contracts, where all economic, market, and financial applications use blockchain to a greater extent than simple cash transactions, such as shares, bonds, loans, and smart contracts. Blockchain 3.0 is the development of blockchain applications outside of currency, finance, and markets, namely in government, health, culture, and the arts. Likewise, blockchain, or distributed ledger, has open (permissionless) and private (permission) network types. Miller et al. (2019) state that anyone can access open networks without membership restrictions, allowing all participants to view encrypted data with anonymity. The World Bank (2017) expresses that participants in the network can leave without any vetting by any entity anywhere, and there are no trust requirements between participants, as it is built on a consensus of ledger entries. On the other hand, private blockchains have restricted user access, such as a group of banks, through permission-based private networks. Anyone outside the private blockchain cannot view or participate in blockchain transactions (KPMG 2018).

Blockchains are characterized by their large size, ability to maintain transactions between parties, allowance for multiple authors to record transactions, elimination of the need for participants to trust, decentralization, connected transactions, secure and identifiable records, and transaction validation carried out by parties that do not need to be individually trusted and tamper-proof (Dragos 2017). In addition, the characteristics of blockchain, according to KPMG (2018), include: a.) an immutable digital ledger, where records of transactional activities cannot be changed or modified and use cryptographic principles; b.) a consensus mechanism, in which each participant in the network has its method of agreeing on how transactions are executed or added to the blockchain system without going through a third party; c.) identity and ownership, i.e., the system depends on a design where the principle of cryptography is to prove the ability to interact with the blockchain and demonstrate ownership. Cryptography is the practice of protecting information using codes, hashes, and signature algorithms. In its development, cryptography has 4 (four) components, which are the basic principles, including Plaintext, namely messages that can be read; Ciphertext, namely random messages that cannot be read; Key, namely the key for carrying out cryptographic techniques, and Algorithm, namely the method for carrying out essay and description. This technology allows data exchange to be carried out directly between more participants in the network without the need for intermediaries. The system adds each transaction, assigned a code, to an immutable chain of transactions. This chain is distributed across all ledgers (nodes) and prevents changes to itself. Each participant in the network independently stores a copy of the information related to each transaction recorded on a digital ledger. All records in the network are immutable, time-stamped, encrypted, and linked to each other (Pugna & Duţescu 2020).

Here is how free blockchain works in general:

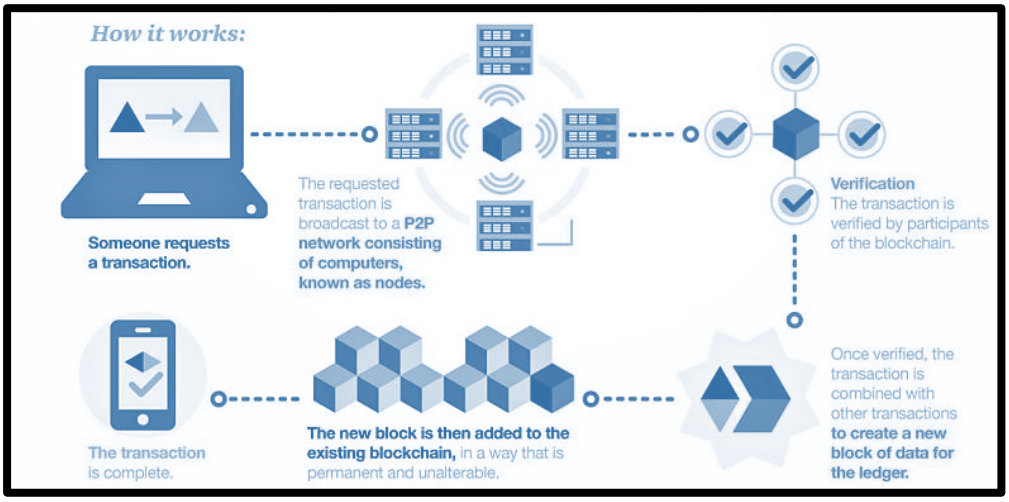

Fig. 3: Blockchain Working Method
Source: PwC (2018)

According to Pedreño et al. (2021), DLT is a decentralized and operational database spread across multiple nodes, eliminating the need for a centralized database. In the traditional ledger recording method in finance, transactions were recorded but verified by a trusted third party (Financial Executives Research Foundation 2018). According to the World Bank (2017), the most important benefits of using private and permissionless DLT for making money are a.) decentralization and eliminating intermediaries; b.) more openness and ease of hearing; c.) automation and programmability; d.) immutability and verifiability; e.) faster and more efficient work; f.) lower costs; and g.) stronger cyber security. Blockchain helps overcome the problem of asymmetric information and smart contracts in a way that is considered more efficient and reliable compared to humans, which are prone to bias, so that the two consistently build on each other, reducing costs and increasing market efficiency, Smart contracts identify the conclusion of a deal and automatically record the contract amount via blockchain. Blockchain can also be implemented in trade finance (Inghirami, 2019). The benefits of blockchain systems will extend to all major segments of the financial services industry across the value chain and drive value significantly in three key areas: risk reduction, cost savings, and increased efficiency.

Whereas Sheldon expressed in Xu et al. (2019) that businesses can use blockchain to store data, increase transparency, enhance data security, and prevent data from being tampered with. Blockchain can potentially change activity accounting, auditing, and control radically. Rechtman, Y. (2017), Schmitz and Leoni (2019), and Wiatt R. (2019) state that blockchain, a distributed ledger technology, will significantly impact the accounting and auditing profession in the future. Pugna and Duţescu (2020) argue that this technology will revolutionize the production, control, archiving, and updating of documents and ledgers, resulting in universal bookkeeping entries. They continue to say that this new type of asset is very difficult to measure in traditional accounting systems and can be managed by accounting blockchains. Existing accounting and auditing procedures are time-consuming and expensive, and even on a case-by-case basis, they are ineffective. Triple-entry accounting using blockchain is a new and potentially much more efficient way to achieve trust and transparency that will disrupt the accounting industry in the future (Cai, 2019). Blockchain, in essence, becomes a recordkeeping solution that goes beyond traditional processes; blockchain aims to protect system records from fraud, corruption, and tampering, increasing the accuracy and reliability of traditional systems (Lemieux, 2017). A review of the literature reveals that the most discussed blockchain themes revolve around the blockchain's unique characteristics (Clohessy et al., 2019; Schmitz & Leoni, 2019; Tan & Low, 2019), factors influencing blockchain adoption in developed countries, integration of blockchain into accounting and auditing, as well as the potential benefits and changes that the industry

may face, and how the accounting and auditing professions are affected by the block chain. It was also customary to focus on the possible solutions blockchain may bring to improve security records in industries and to construct adequate legal registries to engage in economic commerce in undeveloped countries.

However, the understanding of blockchain adoption in developing countries is hampered by the inadequacy of knowledge pertaining to developed contexts. This is predominantly because of the vast socioeconomic, technological, and political disparities that exist between developed and developing nations. The existing body of research pertaining to the implementation of blockchain technology in developing nations primarily focuses on critical sectors including healthcare administration, asset registration, agriculture, and food supply chains (Akinradewo et al., 2022; Mintah et al., 2020). Scientific inquiries, specifically those conducted in the Indian context, underscore the potential of blockchain technology to enhance the precision of supply chain management in developing nations. The objective is to decrease food waste, rectify inefficiencies in distribution, and enhance transparency throughout the procedures. Nevertheless, there is a lack of exhaustive analysis regarding projections for this industry (Moll & Yigitbasioglu, 2019; Schmitz & Leoni, 2019). In consideration of these developments, this study examines the potential advantages and obstacles that the auditing and accounting sector might encounter in developing nations. The objective of this study is to investigate the potential of integrating blockchain technology to enhance the efficiency of accounting and audit procedures. Existing research on blockchain implementation in developing countries is limited, and its effects on accounting and auditing cannot be predicted with certainty at this time. As a result, new research is urgently required. This research aims to provide a comprehensive understanding of the emerging technology and its implications for the accounting and auditing sphere in developing countries (Bonson & Bednárová, 2019; Schmitz & Leoni, 2019).Therefore, conducting such a study was useful for motivating more project implementations with this technology focused on describing the development and system of blockchain, identifying the potential use of blockchain in various fields, especially accounting, analyze internal and external factors in the use of blockchain technology, and finally, answer the research question “How accountants handle potential future blockchain disruptions.”

3. Methodology

The researchers used descriptively oriented qualitative methodologies to study the potential accounting implications of blockchain technology. The primary objective was to offer a full knowledge of blockchain technology from the point of view of accounting, with the primary emphasis being placed on the profound relevance of the technology rather than just the facts. The researcher used a method called purposive screening to choose interviewees in order to ensure that the analysis was carried out only on those individuals who were capable and had a solid understanding of the accounting language and blockchain technology. It was proposed that the approach would be the reason why both the outcomes and the goals of the treatment would be associated with this subject matter. For the purpose of the experiment, the researchers gathered information from persons who had a comprehensive understanding of accounting processes and blockchain technology. In the end, the steps that they took were productive and contributed to the identification of accounting ramifications that were caused by blockchain technology.:

Table 1. List of Interviewers

No	Names	Position
1.	Dr. Abdulsatar Abduljabbar Sultan	Assistant Professor, Catholic University in Erbil, Kurdistan Region, Iraq
2.	Salsabila Aisyah Alfaiza	Lecturer and independent researcher

3.	Mohammad Ghanim, Ph.D.	Banker and founder of the School of Accountancy in Iraq
4.	A.AB.ALI (Pseudonym)	Senior auditor at a private company
5.	Dr. Abudsalim H. Ali	Financial manager at Public Bank, Iraq

Source: Writers

Besides giving factual specifics on blockchain technology's newest accounting and auditing procedures, our purpose is to explore discussions and bite size information approaches. Within the scope of a qualitative investigation that was carried out via the use of the Zoom platform, a tiny focus group consisting of just five individuals was chosen to make use of a procedure that might be considered very rigorous. The group gathered a wide variety of perspectives in order to fulfill the fundamental need of the selection process, which was to ensure that the candidates were relevant to the study issue. The research guide was completed with a great deal of accuracy as a result of the formation of a variety of open-ended questions that were aimed toward the goals of the research study. By conducting a study in which only a limited number of users used the gadget, the first level of guide comfort was successfully accomplished. Data gathering method is conducted after employing Zoom as a recording tool to capture audio and visual from and video of interviews. The participants were fully briefed on the recording technique and signed a permission to be recorded. To guarantee data integrity, the interview transcription process includes an automatic transcription tool and human accuracy checks in addition to the interviews recorder. The investigations proceeded, as the proof was acquired with the support from the records of these transcript files. The principal concern was uncertainty on the part of subjects and it was important to seek authorization from the ethical board for the usage of our study method. The first thing that was taken into consideration was the ethical concept that was used when it came to assigning a greater priority. When doing qualitative research, one of the most important questions to ask is who should be included as participants. This question also helps to determine the primary goals of such research, which are to conduct an investigation that is comprehensive, rich, and in-depth on the topic matter. In many cases, this objective is accomplished by using a method that is known as purposive sampling. For the goal of conducting research that aims to increase one's understanding of the contentious problem of combining blockchain technology with auditing and accounting, the topics being investigated were selected on purpose, taking into consideration their degree of expertise as well as the significance of the subject matter. There are a number of essential components that are included in the selection process. These components include integrating the work experience into the framework of the studies and having an attitude toward the issues that are discussed in them. A comparative analysis of transcribed interviews and a thematic analysis was performed after which data saturation was confirmed. We carried out a methodical procedure to determine the point where additional data ceased to ensure edifying the themes emerging. After the next interviews didn’t lead to new perspectives or evident recurrent themes the task was considered saturated with data. The disclosure of demographic details of participants, for example, location, occupation, and age group, should be done in a confidential way. By adopting this methodology, similar to the fictitious A.AB.ALI, participants can maintain their anonymity while gaining a comprehensive understanding of the context and diversity. Illustrative instances of broad participant descriptions encompass "mid-career professionals hailing from an assortment of industries and regions." Ensuring the ethical integrity of research necessitates the delicate equilibrium between safeguarding the participant's identity and disclosing pertinent demographic data. Dr. Abdul Sattar Abdul Jabbar Sultan, in his capacity as an academic and assistant professor, remains current in the field. As no one dictates what we should teach or say, Salsabila Aisha Al-Fayza, an independent lecturer and researcher, is self-directed, intrinsically motivated, and enthusiastic. In addition, it could be advantageous to provide an impartial viewpoint. In the field of

finance, Mohamed Ghanem, Ph.D., and Dr. Abdul Salam Hussein Ali are authorities on digitization.

The data sources in this research were primary and secondary data. Informants provided primary data through interviews to address research problems and collect relevant information. Researchers conducted interviews via Zoom Meeting and email. Secondary data collection involves indirect methods through third parties or existing sources. Sekaran and Bhojji (2016) mentioned several secondary data sources, including journals, textbooks, dissertations, conference proceedings, reports, newspapers, unpublished manuscripts, and the Internet. Secondary data, covering journals, proceedings, books and other documents related to blockchain and accounting, was used by the researchers in this research. The data collection techniques used in this research consist of interviews and literature studies. We conducted interviews online using the Zoom Meeting application, employing a semi-structured method, and directly engaging with the informant. The literature review for this research utilized various existing sources, including journals, articles, books, and other relevant literature about the study's problem. Sekaran and Bougie (2016) conducted the first data reduction in this research, as it involved various types of data from journals, theses, and informant interviews, which were then narrowed down and focused on the study problems. From this large amount of data, they identified important points or things related to the research phenomenon. The second step in the research process involves data presentation or data display. The data display resulted from data reduction research. The purpose is to clearly express the information obtained from the data reduction results and present it in narrative sentences, providing detailed information for researchers to understand. Third, drawing conclusions is a stage in research to conclude, i.e., by continuously proving the previously obtained data or its relation to the observed meanings to obtain information from the research results.

In summary, a literature review is a broader examination of academic writings to understand the state of knowledge on a topic. At the same time, document analysis involves a focused and systematic study of specific documents to extract information relevant to a particular research question or context. While these methods can complement each other in research, they serve different purposes in scope, focus, and analytical techniques.

4. Results and Discussion

4.1. Technology Development and Blockchain System

The blockchain design was first applied to Bitcoin, as Gunawan (2020) stated in the webinar Blockchain and Its Impact on Finance and Accounting: “Bitcoin's first blockchain is a simple illustration of how the technology powers cryptocurrency's digital assets.” However, the blockchain concept has emerged as a paradigm that can be used in various fields. Blockchain technology has become a trend. This is a technology for recording interconnected transactions and then using unique codes in them, which are eternal and cannot be changed but can only be added to the chain. Thus, it can be said that this system will produce transparent and accountable data because of the cryptographic techniques with which each party in the network can verify the transactions that occur. The World Bank (2017) supports this, stating that blockchain enables more transparent, accountable, safe, fast, and efficient transactions. As stated in the following quote, the concept of blockchain technology has been around for a long time.

> ***“Artificial intelligence and blockchain itself are old, and the concept of artificial intelligence and blockchain has been around since the 1980s. However, at that time, it was just a concept. Because, at that time, computing power was really low... So, new developments since 2011 have not been enough; in America, it happened around 2008–2009 when artificial intelligence and blockchain were booming." (Respondent 1)***

Respondent 3 exemplified the collaboration of various technologies in solving an existing problem by adding blockchain technology and predictive analytics, resulting in the mitigation of various business processes. It can be seen in the following quote:

> ***“With technological advances such as data analytics, blockchain, and artificial intelligence, you realize that risk management is paramount. We have to understand predictive analytics because***

there are very rich indicators. It is in the data. Not yet. Indeed, there are risks or bad events, but the indicators are there. Thus, with predictive analytics and blockchain, I see it as mitigation". (Respondent 3).

The development of blockchain technology, expressed by respondent 1, aligns with the statement (2018) that in the last ten years, it has been divided into five blockchain innovations: a.) The first innovation is Bitcoin, with digital currency experiments; b.) The second innovation is blockchain, namely awareness of the basic technology for using bitcoin, which can be separated from the currency and used for all types of collaboration between organizations; c.) The third innovation is "smart contracts," embodied in second-generation blockchain systems; d.) The fourth major innovation is "proof of staking" with an objective goal, i.e., achieving consensus on the blockchain and ensuring transactions are validated and run according to existing regulations; and e.) The fifth innovation is blockchain scaling.

Canada has made significant progress in the development of blockchain technology. Marina Niforos in Miller et al. (2019), Faccia A. and Mosteanu N. (2019), and Viriyasitavat W. and Hoonsopon D. (2019) stated that the United States and Europe still dominate blockchain innovation. However, blockchain innovation is no less thriving in the Canadian world, as revealed below.

"We have a very well-developed blockchain ecosystem in Canada, particularly in Quebec, so that is the east coast where I am in Canada. I am involved in a project research group with our securities regulator in Quebec, and we meet every month to talk about what is happening in the blockchain space that they need to understand from a regulatory perspective. Therefore, they are very interested in cryptocurrencies and decentralized finance, which is booming in Quebec and Canada. Our first one was just approved; it is similar to a mutual fund but is based on Bitcoin, making it new to Canada and accessible to any retail investor. Thus, cryptocurrencies are very developed, and the tax authorities are all over them. We still have much work to do outside of finance, but we are seeing huge adoption in finance in Canada." (Respondent 4)

Canada does not impose binding and closed regulations on developing new technologies, particularly blockchain. The Bank of Canada (BoC) has been conducting research on central bank digital currencies (CBDCs) for years and was one of the first central banks to research CBDCs (Didenko & Buckley 2021). Blockchain development in Canada is progressing well; the Canadian government has conducted extensive research over the years to explore the potential of blockchain. However, further study of regulations is necessary to ensure the maturity and effective implementation of CBDCs, if required, in the future. Furthermore, Switzerland's characteristics are suitable for continuing blockchain development. Blockchain technology continues to develop in Switzerland, marked by the increasing number of donations, ideas, prototypes, and initiatives towards the technology (Deloit Switzerland, 2017). Automated blockchain technology processes, assisted by smart contracts, simplify claims management in property and casualty insurance by issuing refined expert opinions based on claims history and reducing the potential for claims fraud (McWaters & Bruno, 2016).

Moreover, The Chinese government has also seriously carried out various studies in the development of blockchain technology and has even become a supporter in the financial sector. The Chinese government's recognition of blockchain is comprehensive and does not make Bitcoin the hallmark of a highly decentralized technology. In contrast, the characteristics of China's political system are highly centralized, with regulatory objectives ensuring state control over the development and application of blockchain technology (Ekman, 2021). The Chinese government has issued its digital currency, the digital yuan (e-CNY), through the People's Bank of China (PBoC). The digital yuan is a digital version of the country's fiat currency and has long been predicted to be the first fiat currency in China to launch a CBDC (People's Bank of China (PBOC), 2021; Wang, 2021). Even though it was once the center of Bitcoin trading in the world, the Chinese government banned cryptocurrencies in September 2021 (Zhang, 2021). The Chinese government is trying to shut down cryptocurrencies and develop its digital currency. It can be seen in the following quote:

> ***"China and India, for example, have banned cryptocurrency transactions because they will issue cryptocurrency. Because there was a ready replacement, they issued a regulation banning cryptocurrency." (Respondent 1)***

The same thing is also related to the development of cryptocurrency and the Chinese government's issuance of e-CNY, as seen in the following quote.

> ***"Since the cryptocurrency system operates on the Internet, what can they do to stop people from using it except the Internet? If the government does not like it, there is not much they can do, and they must leave it." (Respondent 5)***

The rapid development of cryptocurrencies in the country has resulted in uncontrolled growth and opportunities for the devaluation and replacement of fiat currencies (Zhang 2021). China is not limiting blockchain application technology to cryptocurrencies alone; instead, it is comprehensively studying and exploring its potential applications in various fields for the future. Blockchain technology is being slowly implemented in Iraq, with examples such as the official launch of the e-seal on October 1, 2021, by the Minister of Finance of the Republic of Iraq and the initiation of the Iraqi Standard QR code (QRIS) by the Bank of Iraq. Iraq has plans to issue a digital dinner or Central Bank digital currency in the future. Users and creators of new learning are still studying the implementation of cryptocurrencies in Iraq for food security, tracking, and banking. It is not yet at the implementation stage, but the development of blockchain technology will proceed quickly and not depend on demand.

From his perspective, Dr. Mohammed stated, "Blockchain technology is not about Bitcoin; it is not about cryptocurrency, which is just one way the technology is used, but in reality, blockchain is an accounting technology." The system's main feature is the capability of cryptographic mechanisms, eliminating the need for authorization from intermediaries and creating a distributed value transfer system. No entity can change old or approved data entries to add new entries to the ledger. In general, a blockchain system works so that each new transaction is combined with a new transaction in a block, which is then added as a new link in the chain of previous transactions. The chain of transactions will then form a blockchain ledger, which all users on the network will store. Users will receive new blocks after verifying that their transactions are valid. No consensus is reached, and the transaction is rejected if deemed invalid. When a user adds a transaction, it becomes a permanent public record that cannot be deleted, damaged, or destroyed.

Blockchain has great potential to influence various industries in the future. This technology is basically a decentralized ledger, so only one ledger is large, and there is no need for reconciliation. Of course, this will save costs without having to incur large costs for a business. Blockchain utilization eliminates uncertainty and enhances confidence in decision-making. For accountants, blockchain clarifies asset ownership and existence obligations and can drastically increase efficiency.

Furthermore, blockchain technology has evolved beyond Bitcoin's original purpose and is currently undergoing testing in various areas of business and finance, with significant potential applications in other fields. This is the same as asserted by Raphael (2018) in a joint interview with the Financial Executives Research Foundation (FERF) that "... also, things like deeds, property rights, and even ownership of music or other digital assets exchanged via blockchain; thus, it also facilitates the collection of appropriate royalties, which has great potential." Thus, this research reveals the application of blockchain to cryptocurrency and its broader relationship to the application of blockchain technology in accounting, auditing, finance, supply chains, and the public sector.

4.2. Blockchain in the Field of Managing Accounting Transactions

The main use of blockchain technology is in the use of cryptocurrencies, but blockchain will completely disrupt the accounting process, and it is only a matter of time (R. Singh, 2017). Blockchain allows accountants to focus more on planning and assessment than only recording. Accountants no longer spend much time on reconciliation; with blockchain implementation, they will have the same records

as customers. “Thus, that is the beauty of blockchain; many jobs will be affected by it, and accountants will make things easier," said McComb J.M., Smalt S.W. (2018), and Gidwani (2021) in the webinar Blockchain and Its Impact on Finance and Accounting.

This blockchain model is based on “triple entry,” an extension of the standard double entry system where all accounting transactions are registered with a third entry (ALSaqa et al., 2019). The third entry (blockchain) encrypts records related to financial parties. A dealer reports a discount on the amount obtained in cash, while a buyer documents a credit for the money expended. However, these accounting records do not appear in the books separately but rather as transfers between accounts in a single general directory, i.e., the development of billing records for cohesive accounting.

Because blockchain is transparent in changing device software, falsifying or deleting written accounting records is difficult (Potekhina & Riumkin 2017). Smart contracts, encoded with accounting and business rules, can efficiently control the process of recording transactions (Vasques 2021). Implementing a triple-entry accounting system with smart contracts, according to Cai (2019), is, for example, in a triple-entry accounting framework where Alice and Bob determine in advance the payment rules on a digital contract that runs alone. Alice will pay Bob $100 after Bob provides services. The two signed a contract on the big blockchain ledger. Once the service is complete, Alice and Bob sign the contract again, order these updates, and program the computer to solve a problem. This smart contract will automatically send $100 to Bob. This can be illustrated in Figure 4 as follows:

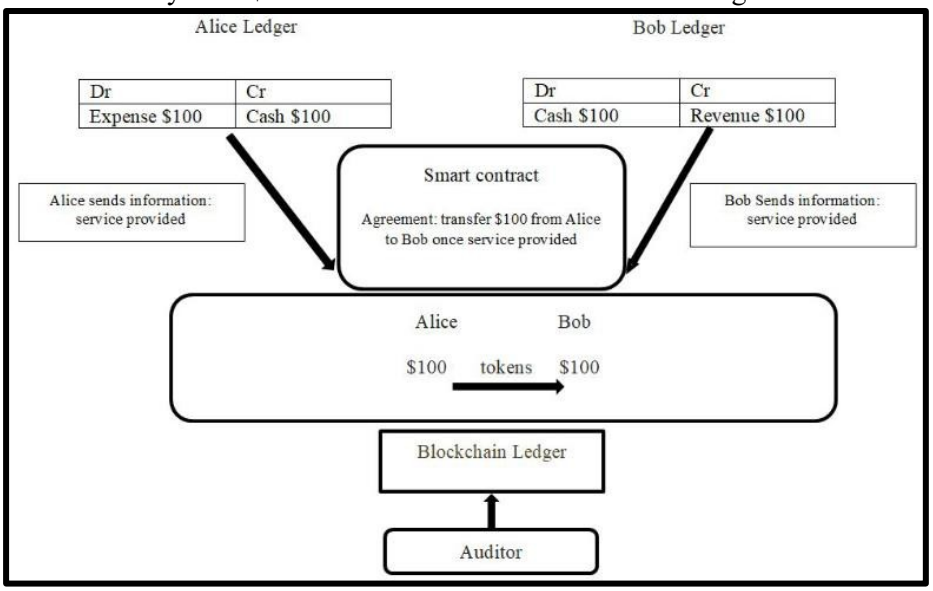

Fig. 4: Example of a Triple-Entry Accounting System Concept
Source: Cai (2019)

Based on an overview of the potential of a blockchain-based triple-entry accounting system that provides solutions to various problems in existing systems, such as issues of trust and transparency, this new framework has the potential to reduce the time required for audits and at the same time reduce related costs, which in turn will increase efficiency in company operations. Preventing fraud involves more than just verifying information. Kokina J., Mancha R., and Pachamanova D. (2017) and Vasques (2021) also added that blockchain has the qualities needed in the accounting profession, namely producing better quality data, improving the quality of accounting and financial reporting, reducing fraud, the accuracy of time data, increased confidence in the material, more analysis that can be done, and control over transactions.

4.3. Blockchains on Field Audits

Blockchain will allow auditors to verify large amounts of data in a short time. In fact, using blockchain technology can reduce the costs and time required to carry out audits (Vijai et al., 2019). According to Dr. Abdulsatar, two things must be distinguished when discussing blockchain and its implementation

in auditing: 1) Does one conduct audits of clients who carry out blockchain transactions? or 2.) Does someone use blockchain as a technology to make auditing easier? First, auditing a client who uses blockchain for transactions requires auditors to possess special skills and acquire expertise from outside sources, which is directly related to the skills auditors need to develop. It is expressed in the following quote:

> ***"If I am auditing people implementing blockchain for transactions, it requires new skills on the accountant's part. To be able to do that, like code audits and the like, is not our forte as accountants. However, it is something we need to learn how to do. Nevertheless, it is possible, and I did it. I spent two years doing ethnography and two years at an accounting firm doing research. They are trying to figure out that they are trying to develop a new service line to provide accounting and auditing services and technology to companies in the blockchain space." (Respondent 4)***

Second, utilizing blockchain technology can support auditing, similar to using big data for conducting audits. Blockchain technology can similarly support auditing by using big data to conduct audits. The use of blockchain technology will be very beneficial. It is as expressed below if carried out for a large company audit.

> ***"If you are auditing Coca-Cola or McDonald's, being able to use some type of blockchain-based audit software could be very helpful, and I know these are things that companies are discussing and trying to implement." (Respondent 4)***

However, not all businesses use blockchain, which was also expressed by respondent 1 as follows:

> ***"Not all businesses can use blockchain; only certain high-value businesses require blockchain security. For example, buying and selling food on the side of the road will not use blockchain. However, personal or population data will likely be used if it involves diamonds or containers. (Respondent 1)***

5. Accountants in the Face of Potential Future Blockchain Disruption

As time goes by, financial software improvement cycles will implement solutions to blockchain that are initially limited in characteristics and then in more comprehensive implementations (Ankenbrand, 2017, page 7). Blockchain is a replacement for bookkeeping and reconciliation work. This could threaten accountants' jobs in the field while adding power to those focused on delivering value elsewhere. For example, in due diligence in mergers and acquisitions, a distributed consensus based on key characteristics will probably spend more time on assessment and advice areas, and the overall process will be faster (ICAEW 2018).

Dr. Mohammed argues that "blockchain is essentially an accounting technology." Dr. Abdulsatar said, "You can use blockchain just like the backbone of a technological backbone for an accounting package." Therefore, accountants need to understand technology well. Blockchain can potentially improve the accounting profession by reducing the costs of maintaining and reconciling books and providing absolute certainty over ownership and assets. Blockchain can also help accountants gain clarity on their organization's available resources and obligations and free up resource power to concentrate on planning, assessment, and recordkeeping.

Blockchain will replace many accounting roles in the future, especially in calculations or bookkeeping, which are often prone to errors. For instance, as an accountant, Will will continue to exist by positioning himself as a business advisor and using his professional judgment to help organizations understand financial challenges in the digital era ahead, which will not be possible with technology such as blockchain (Pimentel 2020). Every country is also competing to find and develop the potential of blockchain to overcome various existing problems. Therefore, as stated by respondent 4, people need to position themselves more openly with this technology and not just be spectators. To face blockchain technology in the future (even now, it has started to disrupt various sectors), professionals and academics need to pay attention to the following things: First, a curriculum in higher education that supports current technological developments, such as learning basic coding and smart contracts, is

necessary to foster understanding and knowledge regarding the developing blockchain. This will ensure that the human resources are prepared when the technology is mature enough for comprehensive implementation. It can be seen in the following quote:

> ***"We will never be the best programmers because we did not spend five years learning how to code when you get a bachelor's degree in computer engineering. Thus, we will never be as good as they are; we can do well if we understand technology well enough to translate it into business language." (Respondent 4)***

Second, academic and professional associations specializing in accounting and auditing should consider publishing accounting and auditing standard designs that can assist accountants and auditors in understanding the potential application of blockchain in the future to ensure they keep pace with technological advancements.

Third, studying business processes as a whole and learning new skills while keeping up with existing technological developments is necessary. In addition to technical skills in accounting, auditing, or information systems, individuals must also focus on skills needed in the current era of disruption. It was expressed by respondent 3 in the webinar Blockchain and Its Impact on Finance and Accounting:

> ***"Focus only on technical. It is good to learn technical finance and accounting, how we treat accounting, and how important it is to study IFRS because the world has been standardized using IFRS. However, it is also important to consider what these reports are for. If you cannot turn data into insight, you know what I can use it for; it is meaningless. As professionals, we focus now on providing insight, which presents a significant opportunity. 'How can I help the business make decisions?' and 'How can I make things easier instead of doing difficult things?' Instead of complicating things, how can I save costs by implementing blockchain technology like that?"(Respondent 3)***

For example, if individuals do not prepare themselves well in this era of disruption, especially with implementing the potential development of blockchain technology, they will be left behind. Therefore, individuals must study the entire business process, not just one specialty, because the world's moments are interconnected. Fourth, being a business advisor or consultant is a new role and is no longer a matter of calculating the column between debits and credits. Respondents 3 and 5 support that in the future era of disruption and technological development, all programs will be computer-based, and all systems will be automated. Accountants are very important to changing the proposition and value and are not only seen as people who count columns (counters) but as professionals who can help advise on clients' business management methods.

This study aims to show and discuss the stage of the blockchain development system, determine potential uses, analyze internal and external factors, and answer the main question of how the accountant's profession deals with blockchain disruption. The researchers utilized the qualitative method to collect data through interviews and supported their findings with literature studies. The findings revealed that blockchain technology has big opportunities for implementation in accounting, auditing, and the public sector, even though practitioners and academics need to be attentive to the educational program, national curriculum, and framework related to blockchain execution, such as a set of skills. Also, the role of accountants today is that of a business advisor or consultant, not a counter. The research concludes that blockchain technology is essentially a distributed ledger. Blockchain is a revolutionary technology that enables data transactions using a decentralized structure and distributed database, eliminating the need for a central authority. Therefore, various sectors can adopt blockchain and benefit from this technology.

However, the implementation of this technology is not without obstacles and challenges. To overcome the difficulties and challenges discussed in implementing blockchain applications in Iraq, researchers need to generate new solutions. Today, countries like Canada, Switzerland, and China are actively conducting research and development in blockchain technology. Iraq is not currently at the

stage of full, widespread implementation of blockchain technology. In fact, the potential uses of blockchain are growing, not only in cryptocurrencies but also in accounting, auditing, finance, supply chains, and the public sector.

The internal factors of the implementation of blockchain technology are strengths and weaknesses. The strengths of blockchain are transparency, security, time-stampedness, and immutability, while the weaknesses are the need for large storage systems, scalability and latency, insufficient implementation awareness, and the need for professionals. Moreover, external factors include opportunities and threats. Opportunities from the implementation of blockchain technology are cost savings and business efficiency, fraud prevention, data protection, and smart contract automation. The threat that arises from the application of this technology is that there are no clear regulations related to the use of blockchain because it is still in the development stage (early stage), and the threat of hackers is still possible.

For this reason, practitioners and academics need to pay attention to the following four things: a.) a curriculum that supports the development of accounting technology; b.) associations and professionals that enable the creation of a framework related to blockchain implementation; c.) the business learning process as a whole and forming a set of skills; and d.) accountants should act as business advisors or consultants and no longer be busy calculating debits and credits.

The results of this research are expected to provide additional knowledge about blockchain technology concerning accounting, especially given the lack of understanding of this technology in Iraq. Academics are anticipated to conduct further research to explore blockchain with a wider scope, starting with the potential application of blockchain and finding new references that remain relevant to existing conditions. Companies should strive to understand better technological developments, particularly blockchain and its potential applications in corporate business. A dedicated research center devoted to blockchain technology is also anticipated to be established by the government because of its enormous potential for usage in a variety of domains.

6. Conclusion

This study is important as it fills in a critical information vacuum about the potential disruption of blockchain technology in Iraqi accounting by providing an explanation of blockchain mechanics and expert comments on adoption risks and options. The approach has important ramifications for professional training, regulatory guidance, organizational adoption, and higher education curricula as it explores related difficulties and skill requirements in a way that is groundbreaking. By measuring opportunity costs, confirming framework utility across industries, and contrasting results with more developed countries, additional research can deepen our understanding. Overall, our findings emphasize that all stakeholders must make determined efforts to use secure applications that support Iraq's ambitious development, as blockchain technology promises previously unheard-of levels of transparency and efficiency improvements.

The study's scholarly ramifications acknowledge that accountants' conventional counter roles have given way to those of corporate counselors or consultants. This change is ascribed to the revolutionary character of blockchain technology, indicating a more extensive influence on the industry than just upheaval. The study highlights the significance of addressing educational programs, national curricula, and skill frameworks associated to blockchain execution in terms of their educational implications. This emphasizes how educational institutions must modify their curricula to give aspiring professionals the tools they need to incorporate blockchain technology into their work. In conclusion, the study offers insightful information about the state of blockchain development at this time, as well as possible uses, implications for education, and the changing role of accountants in the face of technological upheaval. It emphasizes the transformative nature of blockchain and its potential to bring about positive changes in multiple sectors. The study's main limitation is that the researchers utilized qualitative approaches with a descriptive approach as the only data source due to the limited time available, and they aimed to

explain or describe the phenomenon of blockchain technology as a whole from an accounting perspective in the future. Instead of relying on numbers, in future research can focus Subsequent research endeavors can enhance the robustness of this study by employing a combination of alternative data collection methods. One avenue involves the use of large sample surveys to corroborate and validate the findings obtained in this study. Additionally, the promotion of in-depth case studies becomes imperative, particularly as organizational adoption initiatives unfold over time, providing valuable insights into the nuanced aspects of blockchain implementation, or endeavor to make a comparative study with other neighbor countries.

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