

Financial Accounting in light of Blockchain technology

"Opportunities & Challenges"

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Received: 30/04/2021

Published: 15/01/2022

Abstract:

Blockchain appeared in its traditional form in 2008, and at that stage, it was called basic technology. With the acceleration of technological development, it has been used in many sectors and fields, including the accounting profession. Therefore, the aim of this research paper is to try to identify this technology and analyze its capabilities, while clarifying its implications for the accounting profession by conducting an exploratory study on the use of blockchain in accounting in Algeria, considering this technology an integrated element in the accounting ecosystem. The results of this study concluded that Blockchain is of great importance to professionals and academics, and that it contributes positively to raising the performance of practitioners of the accounting profession. But at the same time, it exposes accountants to some risks and challenges that may affect financial reports. In general, the potential of this technology will not be realized until it is widely disseminated among all practitioners of the accounting profession.

Keywords: Blockchain, Accounting, Ledger Technology, Financial reports

Jel Classification Codes : O31 ; M41

Introduction

Blockchain is considered one of the modern technologies that can be considered as the main factor that contributed to the spread of the Bitcoin currency since the year 2008, as it developed with the development of technology, which led to the spread of its use in many fields and it directly affected the performance of many professions, especially the accounting profession.

Blockchain technology represents a decentralized database, which is expected to affect all human professions in the future. Although this technology is complex, the reason for calling it Blockchain was at its simplest level, as the first part of it (Block)

means a mass of digital information, while the second part (Chain) means a chain of the public database. (Reiff, 2020).

Blockchain technology represents a shared, distributed ledger that facilitates the process of recording transactions and tracking assets in a business network. (McComb and Smalt, 2018), This technology also represents a virtual fingerprint, used as an alternative to store data in one place, it contributes to copying data across a huge decentralized network, which allows for reducing transaction costs, and thus eliminating the need for intermediaries and increasing transparency and efficiency.

Blockchain technology has the potential to increase the efficiency of the accounting process transactions and assets, acts as a comprehensive entry bookkeeping system. That would create certainty about rights, obligations and provenance, which in turn is empowering the accounting profession to expand its scope to record more types of activity than before, and delving deeper into the economic reality on which recorded transactions are based. For the accounting profession, this technology represents a new way of organizing accounting, starting from the registration process and ending with verifying the credibility of financial information. (Markelevich, A., 2018).

While there are undoubtedly some technological and legal challenges that need to be resolved before Blockchain can be fully integrated into the world's financial record-keeping systems the unique combination of technical and business knowledge of the accounting profession makes. Therefore, accountants must be aware of this technology, which will inevitably be used by the companies they work for, in one way or another.

From the above, the aim of this study becomes clear, which aims to analyze the so-called blockchain technology from an accounting perspective and attempt to evaluate its implications on accounting practice and then present proposals that would preserve the credibility of financial statements in light of the use of blockchain technology.

- ❖ **The research problem:** From this, the main problem of this research paper can be formulated as follows:
- **What is the impact of blockchain technology on the accounting profession?**
 - **What are the challenges that the accounting ecosystem in Algeria faces when using this technology?**

For the purpose of answering the problem at hand, we relied on an exploratory questionnaire, which was distributed via social networks to a sample of academics and practitioners of the accounting profession in Algeria, so that we could explore and evaluate their perceptions regarding the effects of using blockchain technology in the accounting ecosystem, and also to identify the challenges that face them. Encountered while using this technology.

❖ **The importance of research:**

The importance of the subject of the study is demonstrated through an analysis of the relevant literature in addition to the exploratory study that introduces us to the repercussions of blockchain technology on the accounting profession, as this technology has occupied a large part of the interest of thinkers and relevant bodies, with reference to its various risks and challenges that the accounting ecosystem can face. Because of its wide spread in various fields, which leads to thinking about developing strategies to develop competencies to ensure continuity.

❖ **Methodology :**

In order to reach the results of the study, the descriptive analytical approach was followed by conducting a survey of the literature related to the topic and analyzing the results of the survey questionnaire that was distributed to a sample of accountants and academics, to determine and evaluate their perceptions of the effects of blockchain technology on the accounting profession.

❖ **Research Structure:** This research paper was structured as follows:

- The **first axis** is entitled **Analysis of Literature Review Studies on the Effects of Using Blockchain Technology in Accounting Practice**: we will discuss it through it a review of the theoretical and field literature relevant to the topic of our research.
- As for the **second axis**, entitled **Blockchain technology and its relationship to the accounting ecosystem**, we address through it the concept and capabilities of Blockchain technology in addition to the relationship of this technology to the accounting profession.

- And for the **third axis**, entitled **blockchain technology from the perspective of Algerian accounting practitioners**, we summarize the results of the questionnaire an exploratory survey distributed to a sample of academics and practitioners, regarding their perceptions of blockchain technology and the implications of its use in the accounting ecosystem.

1. First axis ; Analysis of Literature Review Studies on the Effects of Using Blockchain Technology in Accounting Practice:

1.1 Atanasovski, Trpeska & Lazarevska (2020)) study entitled, “accounting information systems and accounting practitioners.

Through their study, the researchers analyzed the disruptive potential of technology for existing accounting information systems and accounting practitioners. Where the most important comprehensive benefits provided by blockchain technology and how it technologically affects the accounting and auditing professions were reached, as these benefits were represented in achieving the characteristics of trust and transparency in accounting information, as well as the characteristics of understandability, comparison, and continuous review, as well as the efficiency and effectiveness of financial data, in addition to reducing risks. Financial statement fraud. Despite these obvious advantages, fundamental problems of the technology were pointed out, such as scalability, interoperability, and the problem of information confidentiality, and how to maintain it.

1.2 Taylor, et al. (2020) study entitled “A systematic literature review of blockchain cyber security”

Through this study, the researcher talked about the traditional database and how all data is recorded on individual servers, where the process is done by copying the information bases on blockchain technology and how it is stored on all computers joining the network. A blockchain is a digital ledger that is distributed over multiple locations to provide security and global accessibility. Currently, the primary use of this technology is crypto currencies and other crypto currencies. However, it is expected that blockchain accounting operations will cease completely in the very near future.

1.3 K.wilinski (2019) study entitled: “Implementation of Blockchain Technology in Accounting Sphere”:

This study aimed to demonstrate the most important characteristics of blockchain technology and that it is rooted in the importance of accounting ownership of the information contained in the database, reliable and honest, regardless of the trust of the counterparty, and to demonstrate the extent to which the introduction of technology in accounting distinguishes itself from high-speed, easy-to-use online transactions using phone applications smart. The researcher used the inductive approach and the descriptive approach based on questionnaires to achieve the objectives of the study and reach the results that introducing technology blockchain will allow records to be synchronized accounting between contractors, which will allow continuous automated audits to be conducted and the focus will shift to questions that require the auditor's own judgment, complex non-standard processes, effective internal control mechanisms, analytics and forecasting, IT auditing, and evaluation. In light of those results, the recommendations were for commercial entities, It will be to use block chain technology.

1.4 ICAEW, (2018) study entitled “Block chain and the future of accounting”

This study explained blockchain technology and all its distinct concepts and terminology, and the potential characteristics of blockchain applications in the field of accounting. This study shed light on the technological and legal challenges that must be. It was solved before blockchain was fully integrated into financial record-keeping systems. It was concluded through this study that the process of applying blockchain technology will take years to be fully developed, unified, and integrated. In the structure of the financial system, however, accounting will be more effective due to increased confidence in the information available and reduced time spent by the accountant resolving records disputes with other parties, allowing greater focus on objectives of final accounting.

1.5 Nakamoto and Bystrom,(2017) study entitled “blockchain-based anonymized dataset distribution platform”

Through this study, the focus and examination was on the bit currency, which is a currency similar to money that can be considered a means of exchanging property peer-to-peer, but it does not depend on a central clearing house such as banks and financial institutions. Through this currency, every ancient currency transaction is stored in a globally distributed digital ledger called blockchain technology, which tracks the entire digital currency transaction historically.

❖ **Contributions of the study:**

What distinguishes our study from other studies is that it reflects the perceptions of accounting profession practitioners about blockchain technology and its repercussions on their job performance, through an exploratory study.

Which was conducted on a sample of accountants and academics, where it was concluded that blockchain has become an indispensable technology in dealing with complex accounting operations, and therefore it greatly serves the accounting and financial field, as it contributes to the development of accounting information systems, and enhancing the capabilities and competencies of profession practitioners, This will allow researchers and specialists to benefit from our study in this field through the results reached and the recommendations that we will present based on these results.

2. Second axis: Blockchain technology and its relationship to the accounting ecosystem:

2.1 Definition of Blockchain Technology:

As researcher Deloitte defined, blockchain is “just another type of database for recording transactions that are copied in all computers participating in the network”. (Deloitte, 2016)

According to the Institute of Chartered Accountants in England, blockchain is not a single technology, but rather a protocol or method for recording transactions. It is a model that can eliminate the need to reconcile disparate ledgers. Also Distribution among all users eliminates interruptions and eliminates the cost of having to pay a central authority to maintain the accuracy of the ledger.

Any participant in the ledger can track all past transactions, allowing for increased transparency and blockchain self-auditing. (ICAEW, 2018)

Blockchain network is composed of a group of computers called “Nodes”. When transactions occur, these nodes use smart contracts and cryptographic algorithms to confirm it and verify its validity, which is then coded and written into “blocks” and broadcasted to the rest of the network. (Punga and Dutescu, 2020)

It also includes blockchain the intersection of many disciplines such as mathematics, cryptography, the Internet and computer programming, from an application perspective, blockchain is a distributed shared ledger database with technical features such as decentralization, full retention, traceability, collective maintenance, openness and transparency. (Su, Xiao & Liu, 2021)

And Blockchain technology is defined as a “chain database or giant spreadsheet that goes beyond a ledger in terms of recording transaction information, secured by encryption” . (Li and al , A., 2022)

Based on the above, a comprehensive procedural definition of Blockchain can be given: It is an information network that contains on a group of machines or nodes, each machine represents a database and a ledger, where all transactions that take place within the network, and every transaction that takes place between two devices is subject to verification and confirmation of its authenticity by other network devices. It also becomes clear to us that blockchain technology is characterized by basic characteristics, the most important of which are : (Zheng , Xie , Dai , Chen & Wang, 2018)

❖ **Continuity**: Since all transactions are spread across the network, they need to be confirmed and recorded in blocks distributed in the entire network, it is almost impossible to manipulate.

❖ **Anonymity**: Every user can interact with the blockchain network via his or her address find out who the user really is.

❖ **Decentralization**: In blockchain technology, there is no longer a need for a third party, as it is used algorithms for conducting these transactions, which significantly reduced costs (including development costs).

❖ **Auditability** (transparency): Since every transaction on the blockchain is verified and recorded using a timestamp, users can easily check and track past records through. Access to any node in the distributed network.

In addition, smart contracts can be considered one of the most transformative applications of blockchain (**Iansiti and Lakhani, 2017**). As it is self-executing and tamper-proof because digital contracts are executed automatically, this technology also determines the terms of the contract between the parties using technical codes (**Cong and He, 2019**).

It should be noted that smart contracts reduce contracting costs between parties on the one hand and increase transparency for all participants within the network on the other hand (**Moll and Yigitbasioglu, 2019**). But it still poses a problem of who is responsible when smart contracts encounter obstacles or are implemented in inappropriate ways.

2.2 Process of blockchain technology:

A digital signature based on private key cryptography is used at the node to initiate a transaction in the decentralized Blockchain network, which is digital assets transferred as a data structure between peers in the network. and Based on some pre-defined criteria, the flood protocol is used, and the pool of unconfirmed transactions is used to store all transactions, which is known as the Gossip protocol, to spread those transactions in the network. These transactions must be selected and validated by peers.

2.3 Blockchain in accounting: (Implications and Perspectives):

By digitizing existing paper verification processes, blockchain technology can effectively impact the database engine of the Accounting Information System (AIS). (**Tan and Low, 2019**) . It enables the accounting data to be stored securely while preserving the nature of the accounts (debit and credit). (**Dai and Vasarhelyi, 2017**) . Among the advantages of blockchain technology are simplifying operations, reducing transaction settlement time and corresponding

risks, and reducing fraud. It also identifies the ways in which this technology addresses most of the current accounting challenges. (McWaters et al., 2016)

Through the literature related to the subject of the study, the benefits of blockchain technology on accounting can be summarized as follows:

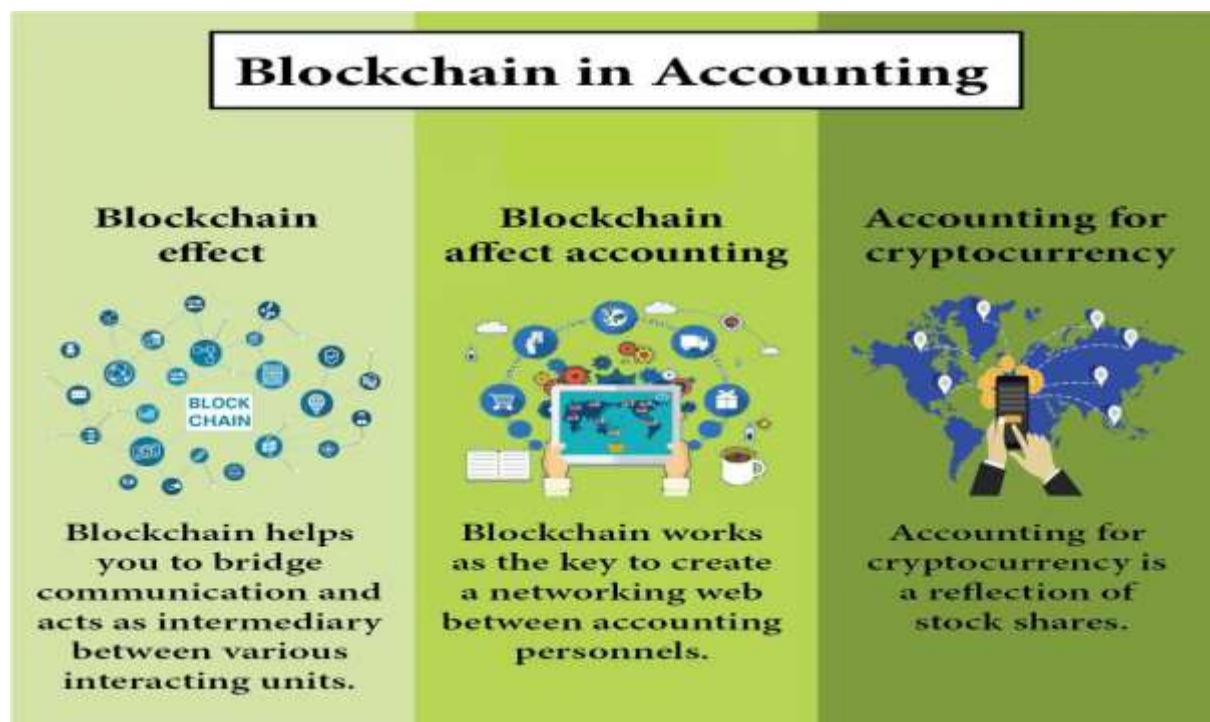
- Blockchain-powered smart contract enables contracts to execute automatically once pre-set conditions are met and facilitates real-time transactions.
- Blockchain provides transparency, visibility, provenance, and immutable records, which enhances security. Any suspicious fund transfer will be observed and detected in real-time.
- Blockchain eliminates imbalance of information among market participants, increases transparency.
- Digitize documents, increase efficiency, reduce costs, reduce human error, automate reconciliation.
- Agreements are codified and executed in a shared, immutable environment, forming an audit trail.
- Provides faster and more accurate reporting by automating compliance processes through a smart contract. It permits real-time monitoring between regulators and regulated entities. (Deloitte, 2017)

In order to increase the efficiency and value of the accounting function, accounting profession practitioners need more understanding and analysis of data, machine learning, block chain, and other modern technologies. Branches of accounting, such as guaranteeing transactions and transferring property rights, can also be transformed through blockchain technology and smart contracts.

Accountants are considered experts. Their primary tasks are to keep records, apply complex rules, and set standards. Regulations and laws are likely to be reformulated in line with the activities of leading companies and accounting bodies. This gives accountants the opportunity to work as advisors to

companies. The following figure shows the importance of blockchain technology in financial and accounting practice:

Figure N° 01:Blockchain in Accounting



Sources: <https://www.datasciencecentral.com/how-blockchain-is-changing-the-accounting-profession/>

3. Third axis : Blockchain technology from the perspective of Algerian accounting practitioners:

After analyzing the literature related to the subject of the study and discussing the potential of blockchain technology to activate the accounting profession, this theoretical part was based on the field study by distributing an exploratory questionnaire to a sample of accountants and academics for the purpose of expressing their opinion about the effects of the blockchain technology on the accounting ecosystem at the national level.

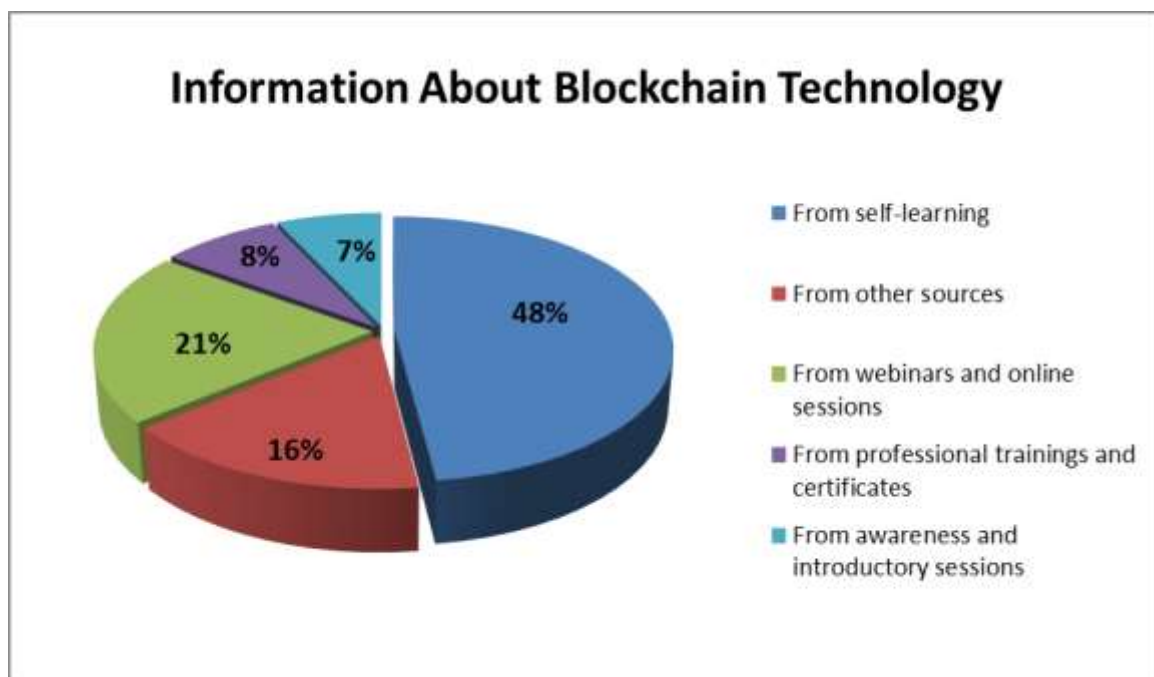
This questionnaire addresses questions about blockchain technology and, its applications by accountants at the national level. Responses were received from

members of the sample consisting of 120 people, but the number of positive responses amounted to only 83 responses.

After analyzing and discussing the results of the exploratory questionnaire, we found that most respondents believe that the accounting profession is always changing and developing in conjunction with technological development.

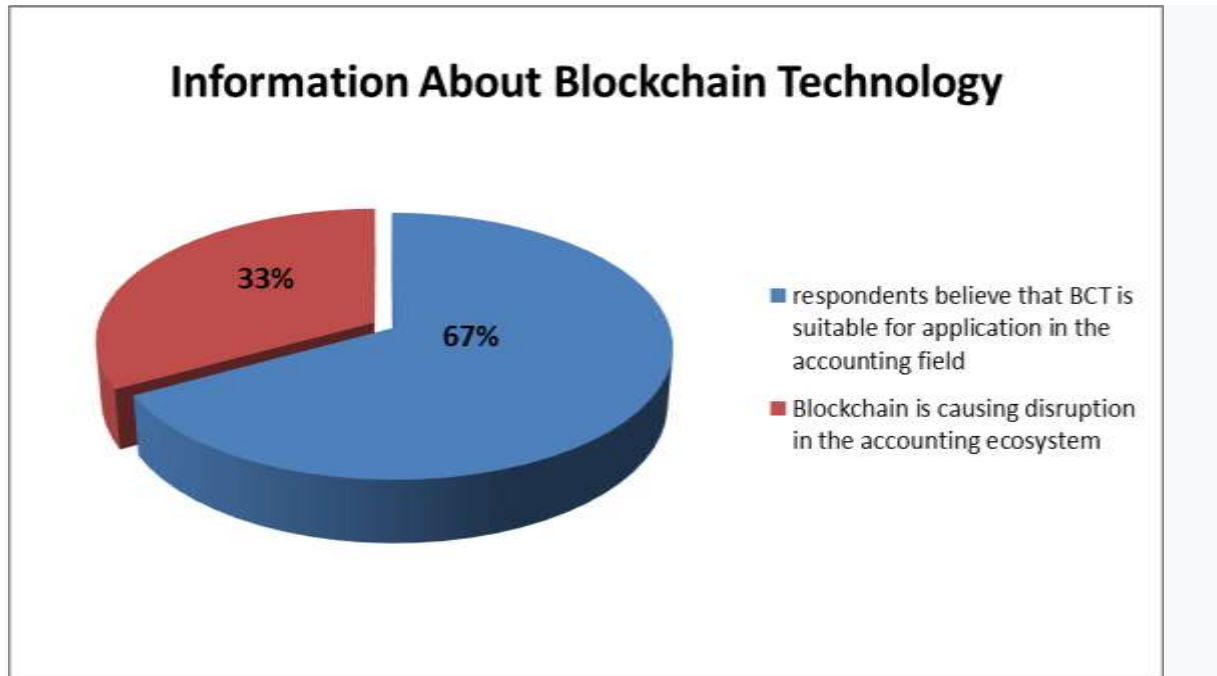
The following figure explains how respondents acquired information about blockchain technology and its relationship to the accounting profession:

Figure N° 02: Information About Blockchain Technology



As for the questions about the positive or negative impact of blockchain technology on the accounting profession, the percentages vary between respondents, some of whom believe it is appropriate and some of them do not think so, as shown in the following figure:

Figure N°02: Impact of blockchain technology on the accounting profession



On the other hand, we find that the majority of respondents agree that major accounting office's can play a fundamental role in their reliance on blockchain technology in Algeria, but they call for the necessity of adopting a basic cooperation agreement, which requires changes in the current situation, and which will mainly include all... Accounting standards and regulations, with the need for regulatory bodies to join BC networks and enable them to perform their oversight role effectively.

4. Results and Discussion

The above theoretical and field study indicates the effects of the accounting ecosystem when using blockchain technology for the purpose of seeking transparency and trust in accounting practices. Where practitioners of the accounting profession can improve their job performance and thus the inevitability of successful decision-making through their control over blockchain technology due to the facilities this technology provides in terms of effort and time. Blockchain technology also adopts triple entry, which enables accounting to reduce the cost of ledger maintenance and reconciliation.

For the purpose of helping companies provide consistent financial information while reducing ethical risks, the latter can use blockchain technology due to its ability to provide transparency, accurate distribution, stability, and computational logic of the technology through smart contracts or automation.

Both academics and accounting professionals need to adapt to new technologies, especially blockchain, and therefore their knowledge and skills must be expanded to meet them, taking into account the various risks and challenges arising from adoption such emerging technologies. However, the application of blockchain technology must be subject to further testing and monitoring by all its users, especially accountants, to ensure reporting on the accounting ecosystem.

Blockchain technology makes it easier for managers to handle accounting data because it provides smart contracts and records the data accurately. Moreover, to achieve cooperation and coordination in blockchain networks or ecosystems, the technology can innovate a new way of financial collaboration for managers, accountants, business partners, investors and auditors. Blockchain technology also works to move from traditional accounting processes to smart ones by increasing the digitization of contemporary paper verification. It provides a better tool for accountants and auditors to focus on more valuable activities such as strategy and in-depth analysis.

From the above, it can be said that blockchain technology will give accountants more skills and will also give them more time, enabling them to focus on planning and evaluation processes for the purpose of expanding the scope of accounting.

5. CONCLUSION

Through this study, blockchain technology was shed light and its potential in improving accountants' skills was analyzed and demonstrated the opportunities and challenges facing practitioners of the profession by reviewing the implications of this technology on the accounting profession at the national and international levels. For this reason, a set of discussions and analyzes were conducted regarding the theoretical aspect of blockchain technology from an accounting perspective, while presenting a framework for applying this technology to the accounting ecosystem. Therefore, this technology must be

considered as an element that complements this system. On the other hand, the theoretical survey was supported by an exploratory study. Online to seek the opinions of academics and professionals, regarding the capabilities and the effects of blockchain technology in Algeria.

It was found that the use of blockchain technology in accounting results in several positive points, such as an increase in trust transparency is one of the conditions for financial information, in addition to the possibility of following up on transactions and carrying out accounting processing at the same time fraud prevention. It also enables accountants to automatically generate their financial reports, which contributes to reducing costs.

Moreover, blockchain technology is also able to reduce financial disclosure and earnings management errors, thus enabling the provision of financial statements that truly reflect the financial position of the company while showing the actual result of the activity at the end of the fiscal year.

However, using this advanced technology makes companies face various challenges, including technical, regulatory, and legal challenges, such as energy consumption, storage capacity, privacy, scalability, interoperability, and cybersecurity. Blockchain technology involves process change, workflow change, and cultural change. Reaching the benefits may be more complex than thought, so the real challenge lies in managing change in terms of people, culture and processes.

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