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The Impact of Digital Transformation and Blockchain on Accounting in Algeria

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Abstract:

This study aimed to analyze the level of knowledge of accountants in Algeria regarding blockchain technology, understand its characteristics and applications, and measure their awareness of its impact on the accounting profession. To achieve this, a questionnaire was developed and distributed to a random sample of 54 financial accountants in Algeria. Primary data were collected and analyzed using a set of appropriate statistical methods to test the hypotheses via SPSS software.

The study results showed that the respondents possessed a low level of knowledge about the characteristics of blockchain technology used in accounting. It also indicated that their understanding of the impact of this technology on the accounting profession was cautious, due to the novelty of the technology and their lack of direct experience with it, making it difficult to form a positive or negative judgment about it. Furthermore, the study confirmed a direct correlation between the respondents' awareness of information technology developments and their level of understanding of the characteristics of blockchain technology in the field of accounting.

Keywords: Blockchain, Accounting Profession, Digital Transformation Technologies

1- Introduction:

Information and communication technologies have witnessed fundamental developments, bringing about widespread and indispensable changes across various fields. The accounting profession has not been immune to these transformations. It now operates within a rapidly evolving and changing environment due to the significant advancements in information technology in recent years. This has led to the adoption of numerous modern technologies, most notably blockchain technology, which has had a remarkable impact on the field of accounting.

The impact of blockchain on the accounting profession cannot be ignored, as the future of this profession is now linked to its ability to utilize this technology. The use of blockchain contributes to enhancing the work of accountants by providing accurate and reliable data, which in turn strengthens the effectiveness of accounting by improving the quality of information and increasing the efficiency of accounting processes. This technology also helps accountants face increasing challenges and clearly develop their working methods, making it a fundamental element in developing the profession and adapting it to the demands of the digital age.

Main Issue

Based on the foregoing, the main problem can be posed in the following fundamental question:

To what extent are accountants in Algeria aware of the impact of blockchain technology on the accounting profession?

To simplify and facilitate the study of this fundamental question, we have formulated the following sub-questions:

- Do accountants in Algeria have sufficient awareness of blockchain technology, its characteristics, and its applications?

- Does the application of blockchain technology have an impact on the accounting profession?

- Is there a statistically significant relationship between the sample's level of awareness of information technology developments and their level of awareness of the impact of blockchain technology on the accounting profession?

Study Objectives:

The fundamental objective of this study is to identify the extent of accountants' awareness of blockchain technology in the accounting profession in Algeria by determining their level of understanding of its characteristics and applications. This study also aims to demonstrate the relationship between the sample's level of awareness of information technology developments and their level of awareness of the impact of blockchain technology on the accounting profession. Study Hypotheses

To achieve the study's objectives and address the research problem, we formulated the following hypotheses to test and confirm, in whole or in part, or refute them:

- Accountants in Algeria possess an understanding of the characteristics of blockchain technology in the accounting profession.

- Blockchain technology impacts the accounting profession.

- There is a statistically significant relationship between the sample's awareness of information technology developments and their understanding of the impact of blockchain technology on the accounting profession.

Significance of the Study:

This study is significant because it is directed at accounting professionals in Algeria to assess their awareness of blockchain technology, which will impact the accounting profession in general. Adaptation, innovation, training, and mastery of various technological advancements have become essential for all accountants. This study is also important for various economic institutions seeking to update their accounting software and adopt modern programs to keep pace with the digital age. Furthermore, this study holds academic significance as it addresses a contemporary research topic, providing researchers with an opportunity to explore and delve into it from different perspectives.

Study Methodology:

The study employed a descriptive approach. At the descriptive level, the theoretical literature was reviewed by examining various theoretical and field studies to grasp the theoretical framework of the topic. A questionnaire, developed using scales created by several researchers, was used to collect primary data and test the hypotheses.

Previous Studies:

Implementation of blockchain technology in accounting sphere (Aleksy Kwilinski .2019)

This study aimed to highlight the advantages of applying blockchain technology in accounting by facilitating and accelerating transaction processing and updating accounts using smartphone applications. The researcher employed diverse scientific methodologies, utilizing historical, descriptive-analytical, and comparative approaches in the theoretical framework, and inductive and deductive reasoning in the practical aspect. The study's findings demonstrated that blockchain technology will fundamentally transform how companies handle invoices, documentation, processing, recording, and payment methods, enabling all these processes to be carried out electronically and instantly. The study also indicated that the double-entry bookkeeping system may disappear and be replaced by a fully computerized accounting approach.

Accounting and Auditing at the Time of Blockchain Technology (Jana Schmitz -Giulia Leoni, 2019)

This study explored the impact of blockchain technology on the accounting and auditing profession by surveying the opinions of accounting scholars and practitioners in the field. It sought to identify the key themes emerging from academic research, professional reports, and websites discussing blockchain technology within the context of accounting and auditing. The study concluded that the most frequently discussed topics in academic research and professional sources were governance, transparency, and trust within the ecosystem, along with smart contract applications, the paradigm shift in the roles of accountants and auditors, and the development of their skills to effectively utilize this technology.

Adoption of Blockchain Technology in Accounting and Auditing (Shilpa Vardia, Himalaya Singh, 2022)

This study aimed to assess accountants' awareness of blockchain technology and examine its benefits and the challenges of its use in accounting and auditing. A statistical approach was employed, distributing a questionnaire to 75 accounting professionals. The results revealed that graduate students and researchers possess familiarity with blockchain concepts and an understanding of its potential applications. Key benefits of blockchain technology included enhanced trust, control, information security, and fraud and corruption prevention. However, the findings also highlighted challenges to investing in blockchain technology within accounting and auditing, such as a lack of available information and the absence of legal regulations. Nevertheless, accountants and auditors expressed strong support for the use of blockchain technology in accounting and auditing.

A 2022 study by Al-Basha, Hammam Muhammad Ahmad, investigated the impact of blockchain technology on the accounting profession. This study aimed to understand the theoretical framework for blockchain technology and clarify its applicability within the local environment, while also examining its impact on the accounting profession. The results showed that the strength of blockchain technology lies in two key criteria: decentralization and high transparency in managing various types of transactions, such as payments, bank transfers, property registration, and the exchange of assets and documents.

2- Theoretical Framework:

2-1 Digital Transformation:

Digital transformation is defined as an ongoing process that leads to changes in business models as a result of using digital technologies such as artificial intelligence, big data analytics, cloud computing, and blockchain technology in various value-added operations. This transformation ultimately results in improved efficiency and increased profitability. It is also defined as the change associated with the application of digital technology in all aspects of human society.

Digital transformation technologies also contribute to the possibility of profound transformations in work methods, as their role is not limited to enhancing traditional processes but also opens the doors to innovation and creativity in various fields. This transformation requires a sustainable infrastructure and support that includes guidance and direction to maximize the benefits of these technologies.

Digital transformation can also be defined as the radical change that occurs within a company or government, where modern digital technologies are adopted to improve all aspects of business operations. This transformation leads to a reshaping of how the company operates and the development of new products or services, ultimately resulting in a fundamental shift in the business model.

2-2 Digital Transformation Technologies:

Artificial Intelligence: The term artificial intelligence is among the most widespread and frequently used topics today. Artificial intelligence (AI) is defined as the ability of machines to perform human cognitive functions, such as problem-solving, learning, and pattern recognition, enabling them to make predictions that facilitate decision-making. AI is also considered a system programmed to think and perform activities expected of the human mind, including the ability to acquire knowledge, understand relationships, and generate original ideas. The scope of AI includes the ability to control processes automatically and flexibly, representing a revolutionary advancement in improving the productivity of various professions. AI has been introduced in the field of accounting to enhance the performance and efficiency of accounting activities and provide reliable and controlled information. This contributes to facilitating more effective strategic decision-making and reducing the occurrence of fraud and human error, thus significantly improving accounting functions. (Tuwaib, 2022)

Big Data: This is defined as a large collection of structured, unstructured, and semi-structured data, primarily captured by machine sensing, obtained from various sources and contexts. It is characterized by its large volume, wide variety, low value density, high speed, and timeliness. Data is at the heart of the accounting profession, and big data offers numerous opportunities for significant development in the field. This is achieved through predictive models that provide high-quality

data processed in real time. As a result, more accurate financial reports are produced, performance is measured more effectively, and budgets are more reliable. Big data can improve data quality, accuracy, completeness, and availability. Cloud computing, the next generation of computing, allows users to access additional resources not available to them and operate on a high-capacity computing infrastructure provided by a cloud service provider at a low cost. Organizations are increasingly moving towards migrating their information systems to the cloud, finding this technology a suitable solution that aligns with their competitive objectives, despite the drawbacks and risks inherent in this modern technology. (Yahya Sharqi, 2022)

2-3 The General Concept of Blockchain Technology

Blockchain technology can be defined as an information network containing a set of devices and nodes. Each device represents a database and a ledger, storing all transactions that take place within the network. Each transaction is processed through two devices and is subject to verification and confirmation of its validity by the other devices in the network (Mada Abdul Latif Al-Rahili, 2020).

From an accounting perspective, blockchain technology has been defined as a public ledger that records transactions, parties, contracts, intermediaries, verification, and disclosure (Swan, 2015). It has also been defined as a giant data table that includes the recording of all assets, as well as an accounting system for dealing globally with all types of assets by all global parties. Furthermore, it has been defined as a decentralized, distributed public ledger capable of confirming and storing the transactions that pass through it. This means that the ledger is not owned or controlled by any party; instead, network control is distributed among the network users (Sarkar, 2018). It is clear from the above that blockchain technology in accounting is a data table that includes the recording of digital transactions and events. Yes, verification and proof of ownership by the parties are necessary to achieve reliability and credibility.

2-4 Blockchain Technology Characteristics:

Blockchain technology possesses a number of important characteristics as a result of the technological and scientific advancements that have accompanied its development. These characteristics are as follows:

Transparency: Transaction records have become more transparent through the use of blockchain technology. Due to the use of a decentralized network, all network participants share the same records instead of individual copies. Therefore, this shared record can only be updated through consensus, meaning everyone must agree. Changing a single transaction record requires changing all subsequent records and the entire network to conspire. Consequently, the data on the blockchain is more accurate, reliable, and transparent than before.

Efficiency and Speed: With traditional trading processes, trading anything is a time-consuming process, susceptible to human error, and often requires third-party mediation. By simplifying these processes and completing them using blockchain technology, transactions can be completed faster and more efficiently. (Adel Sobhi Abdelkader Al-Basha, 2022)

Security: Blockchain technology is more secure than traditional centralized systems in several ways. Transactions must be agreed upon before being recorded. After a transaction is approved, it is encrypted and linked to the previous transaction. Additionally, information is stored across a network of computers (peer-to-peer) rather than on a single central server. This makes it extremely difficult for hackers to compromise transaction data.

Decentralization: In traditional centralized systems, verifying each transaction requires going to a trusted central authority, such as a central bank. This incurs additional costs and puts strain on the central infrastructure. However, in blockchain technology, there is no need for a third party, as distributed algorithms are used to verify these transactions. This approach significantly reduces server costs, including development and operating costs, and lessens the strain on the central infrastructure. (Al-Habou, 2023)

Continuity: Because all transactions distributed across the network need to be verified and recorded in blocks distributed across the entire network, it is virtually impossible to tamper with them. The validity of each block is verified by checking its digital signature and the information it contains. Additionally, transactions are validated as they are added to the block, further enhancing the integrity and security of the record. This approach makes it extremely difficult to manipulate or

illegally alter transactions, as any attempt at forgery would have to overcome the verification process of numerous blocks across the network. Thus, blockchain technology enhances data security and provides robust documentation and transparency in transactions.

User Anonymity: Each user can interact with the blockchain network using a unique address that prevents the disclosure of their true identity.

2.5 Blockchain Technology Mechanisms

Blockchain technology operates by distributing data across a vast network of nodes. These nodes act as computers responsible for verifying the data and transactions within the system. Each transaction is encrypted by these nodes and linked to the previous one using cryptography. This prevents tampering or modification of the data. Blocks are linked to each other using a public key, which is distributed across the network and used to identify each transaction. There is also a private key possessed only by the transaction owner, which contributes to increased security and identity verification in the blockchain system. The technology includes the following elements:

- Distributed Ledger:

A distributed ledger is a decentralized financial record containing data on financial, physical, legal, and electronic assets. It can be shared across a network of multiple locations, geographic regions, or institutions on a peer-to-peer basis. All participants on the network can obtain their own identical copy of this ledger. Any changes to the ledger are reflected in the prevention of copying, either by the minute or in certain cases. The security and accuracy of the assets stored in the ledger are maintained cryptographically. Therefore, this ledger is considered one of the fundamental elements of blockchain. (Nasser, 2023)

- Decentralized Database:

This mechanism aims to eliminate the concept of centralization, as there is no central entity, server, or device controlling the blockchain. Instead, the chain is distributed among all participants worldwide. Anyone around the world can download, view, and participate in the chain. This principle is part of the system's security, making it extremely difficult for anyone wishing to manipulate or hack the blockchain to do so effectively. An attacker would need to compromise every single individual on the network to achieve their goal, which is highly unlikely. (Hamed, 2020)

- Mining: This mechanism utilizes the power of computers and the internet to solve mathematical equations and verify transactions in order to extract cryptocurrency assets. These transactions are grouped into a single block to solve a complex mathematical puzzle or equation. The first person to solve the equation is rewarded with transaction fees or new units of the participating cryptocurrency. This is done using an algorithm called a "hashing algorithm."

Miners around the world perform complex calculations on their computers to obtain the correct hash that links a transaction to its predecessor in the chain. This process ensures that the new transaction took the same amount of time as the previous transactions. Once the correct hash is obtained, the transaction is recorded on the chain and added to the blockchain. The system is highly secure, making it difficult for anyone to attempt to hack or manipulate it. (Hamed, 2020)

2-6 Applications of Blockchain Technology

Auditing: Blockchain technology is a good solution to the traditional challenges facing audits, such as high audit costs and risks, and limitations of audit software. This technology can reduce the burden of audits, shorten the audit cycle, and significantly improve the efficiency and cost of operations. Blockchain also enables real-time data verification and updating across the entire network, reducing the opportunities for data manipulation and financial fraud. Furthermore, blockchain technology significantly improves audit quality, enabling greater accuracy in corporate accounts. Many traditional audit processes can be replaced with more efficient and secure ones.

In addition, Cheng & Huang (2019:66) indicate that using blockchain technology can significantly reduce audit costs. With these features, blockchain technology is considered an innovative and effective solution for improving audit processes and reducing associated costs.

Taxation: The use of blockchain technology in the tax field represents a major business transformation. The unique transparency of blockchain technology significantly contributes to improving tax compliance processes. Access to information and data from multiple sources, whether from the company itself or the tax authority, provides a strong foundation for verification and trust. This information is more reliable because it has been verified by all participants within the network. The security feature of the immutability of data and information within the digital ledger enhances confidence in financial data and significantly reduces the risk of fraud. Blockchain technology ensures that information remains stable and tamper-proof, facilitating fraud detection and promoting transparency and integrity in the tax system. Furthermore, real-time information enhances the efficiency and accuracy of tax reporting, as information is updated instantly for all network participants. This reduces delays and contributes to improved tax procedures and immediate decision-making based on accurate and up-to-date information.

Smart Contracts: Smart contracts are a vital component of blockchain technology. They are a set of digitally defined promises made and programmed within a decentralized blockchain-based distribution network. These contracts regulate the terms and conditions of relationships between the parties involved, without the need for a central authority. Smart contracts are used to automatically and programmatically execute and enforce the terms and conditions of agreements between parties. They can facilitate asset exchanges and provide confidence in transaction execution by utilizing the details programmed into the smart contract. Smart contracts are an innovative tool that eliminates the need for intermediaries and reduces the risks of fraud and hacking, achieving high levels of security and efficiency. They find applications in a wide range of fields, including property documentation, bank loan issuance, intermediary money transfers, insurance claim processing by insurance companies, and other innovative applications that benefit from the transparency and security inherent in blockchain technology.

Financial Transactions: Blockchain technology has a profound impact on the financial sector worldwide. Its decentralized nature is widely utilized by individuals and businesses, particularly in areas such as domestic and international money transfers, cryptocurrency trading, and financial markets. Thanks to its speed and low cost, blockchain effectively simplifies and accelerates payment and transfer processes. Furthermore, blockchain facilitates direct and efficient lending and project financing, making it an effective tool for supporting startups and stimulating crowdfunding models.

2-7 The Impact of Blockchain Technology and its Applications on the Accounting Profession:

Blockchain technology initially began its primary use in the field of cryptocurrencies, but over time, its applications have expanded to encompass a diverse range of uses. It has had a direct impact on the field of accounting, as accounting information systems have been developed to leverage its unique characteristics. The emergence of blockchain technology, based on a distributed and decentralized database, has led to changes in the traditional accounting system, particularly with the introduction of the distributed ledger concept. In this context, the blockchain distributed ledger is a system where transactions cannot be deleted. All transactions occurring within the network are recorded, stored, and monitored instantly and efficiently.

Blockchain technology enables a shift away from the traditional double-entry bookkeeping system, as the distributed ledger relies on recording transactions in a way that cannot be altered or deleted. The blockchain-based accounting information system verifies transactions in real time, facilitating the preparation of reliable and transparent financial statements. This makes it a three-entry bookkeeping system, ensuring efficient transaction recording and incorporating debit and credit entries, along with cryptographically signed transactions.

3- Field Study:

Having addressed the fundamental concepts of blockchain technology and its characteristics in the first part, which focused on the theoretical framework of the study, this section will concentrate on achieving the main objectives, verifying the hypotheses, analyzing the data, and drawing the main conclusions.

3.1 Statistical Tools Used in Data Analysis

After entering the data into the IBM SPSS V23 statistical software, it was analyzed using a set of descriptive and inferential statistical tools:

First: Descriptive Statistical Tools: The following descriptive tools were used to analyze the responses of the study participants:

- Absolute and Relative Frequencies: This method is suitable for categorizing and presenting data clearly and simply. These frequencies were used in the study to determine the frequency of the respondents' personal variable categories and represent them in frequency tables to describe the study sample.

- Pearson Correlation Coefficient: This coefficient was used to measure the degree of correlation and study the relationship between two variables. It was also used to calculate the internal consistency of the questionnaire items and their construct validity.

- Measures of Central Tendency: This involved calculating the mean of each questionnaire item and understanding the responses of the study participants, as well as their level of agreement with each questionnaire item.

- Measures of Dispersion: These were used to calculate the standard deviation and determine the degree of dispersion of responses from the mean. The lower the standard deviation, the greater the concentration of responses around the mean.

- Crumbach's Alpha Test: This test was used to determine the reliability of the questionnaire items.

Second: Inferential Statistical Tools: Normality Test: The Kolmogorov-Smirnov test was used to determine the type of data distribution. T-test: Single sample test: Used for a single sample to determine whether the average agreement score reached the mean score of 3, exceeded it, or fell below it. It is used to confirm the significance of the mean for each questionnaire item.

Independent sample test: Used for independent samples to determine differences in questions with two answer choices.

One-way ANOVA: Used to test whether there are statistically significant differences in the attitudes of the sample members.

Regression model: Used to test hypotheses about the effect of independent variables on dependent variables by finding a linear equation for the independent variables in terms of the dependent variable, and also to calculate the degree of correlation between these variables.

3.2 Validity and Reliability of the Study Questionnaire

To ensure the validity and reliability of the questionnaire and to depend on its results with complete confidence, it was necessary to measure the validity and reliability of the questionnaire. Section One: Questionnaire Validity

Questionaire validity means that the questionnaire items accurately reflect what they are designed to measure and are capable of achieving the study's objectives and answering its questions and hypotheses. Questionnaire validity was confirmed in two ways:

- External Validity (Interpreter Validity):

This was achieved through expert review by presenting the two questionnaires to a number of academic and professional university professors specializing in accounting and auditing. Based on their feedback, guidance, and suggestions, the questionnaires were finalized.

- Internal Validity (Internal Consistency Validity):

This was achieved using software and involves determining the correlation between the questionnaire items and the dimension to which each item belongs, as well as the correlation of these dimensions with the overall score of the axis to which they belong. This was done by calculating the Pearson correlation coefficient.

3.3 Validity of Internal Consistency for the First Axis: Accountants possess sufficient knowledge of the characteristics and uses of blockchain technology.

The Pearson correlation coefficient was calculated to illustrate the correlation of each statement in the first axis with the overall average of the dimension to which these statements belong. The following table illustrates this:

Table 01: Validity of internal consistency of the statements in the first axis

Statistical significance	*Sig (Bilatérale)*	*Corrélation de Pearson*	N
statistically significant	0,000	0,736	1
statistically significant	0,000	0,707	2
statistically significant	0,000	0,759	3
statistically significant	0,000	0,742	4
statistically significant	0,000	0,646	5
statistically significant	0,000	0,599	6

La corrélation est significative au niveau 0,05 (bilatéral)

Source: Prepared by the researchers based on SPSS V23 results.

It is observed from the values in the table above that the Pearson correlation coefficients for the statements in the first axis are positive and statistically significant at the 0.05 significance level. This is because the probability values for these statements are 0.000, which is less than the 0.05 significance level. This confirms the existence of a direct relationship between the statements in this axis and that they are true for what they were designed to measure.

Internal Consistency Validity of the Statements in the Second Axis: Accountants are aware of the impact of blockchain technology on the accounting profession.

The Pearson correlation coefficient is calculated to illustrate the correlation of each statement in the second axis with the overall average of the dimension to which the statements belong. The following table illustrates this:

Table 2: Internal Consistency Validity of the Statements in the Second Axis.

N	*Corrélation de Pearson*	*Sig(Bilatérale)*	Statistical significance
1	0,769	0,000	statistically significant
2	0,696	0,000	statistically significant
3	0,612	0,000	statistically significant
4	0,648	0,000	statistically significant
5	0,726	0,000	statistically significant
6	0,725	0,000	statistically significant
7	0,728	0,000	statistically significant

8	0,744	0,000	statistically significant
9	0,602	0,000	statistically significant
10	0,571	0,000	statistically significant
11	0,830	0,000	statistically significant
12	0,849	0,000	statistically significant

Source: Prepared by the researchers based on SPSS V23 results.

We observe from the values in the table above that the Pearson correlation coefficients for the statements in the second axis are positive and statistically significant at the 0.05 significance level. This is because the probability values for these statements are 0.000, which is less than the 0.05 significance level. This confirms the existence of a direct relationship between the statements in this axis and that they are valid for what they were designed to measure.

5.3Validity and Reliability of the Study Sample

To ensure the validity and reliability of the questionnaire statements, we selected Cronbach's alpha for the study sample's responses, as it is one of the most common methods for measuring reliability and validity. This coefficient is considered acceptable if it is equal to or greater than 0.6.

The following table shows the reliability and validity coefficients for the study axes:

Table 3: Validity and Reliability of the Study Sample

stability coefficient	Validity coefficient	N	Axes
0,774	0,720	6	I
0,910	0,720	12	II

Source: Prepared by the researchers based on SPSS V23 results.

We observe from the values in the table above that the reliability and validity coefficients for the study's axes exceed the statistically acceptable threshold of 0.6. Furthermore, the overall reliability and validity coefficients for the questionnaire are 0.922 and 0.820, respectively, which are close to one. This indicates that the reliability and validity of the questionnaire questions are very high. This is evident if the questionnaire is redistributed multiple times and yields the same results. Thus, we have confirmed the reliability and validity of the questionnaire and its suitability for study and analysis, enabling us to confidently test the hypotheses.

7.3Presentation and Analysis of the Study Sample's Responses

We will analyze the study variables based on the responses of the study sample.

1.7.3Presentation and Analysis of the Study's Functional Variables

First: Educational Qualification: The table below shows the distribution of the sample members according to their educational qualifications as follows:

Table 4: Distribution of the Study Sample Members According to Educational Qualifications.

%	repetition	Academic qualification
% 35,2	19	Bachelor's Degree
% 39,3	14	Master's Degree
% 14,8	8	Master's
% 24,1	13	PhD
%100	54	Total

Source: Prepared by the researchers based on SPSS V23 results.

Regarding the educational qualification variable, the table above shows that the majority of the sample holds a Bachelor's degree, numbering 19 individuals (35.2%), followed by 14 individuals with a Master's degree (39.3%), 13 individuals with a PhD, and finally 8 individuals with a Master's degree 14.8%.

Secondly, occupation: The table below shows the distribution of the sample by occupation as follows:

Table 05: Distribution of study sample members by job. Source: Prepared by the researchers based on SPSS V23 results.

%	repetition	Job
%9,3	5	Accounting Expert
%31,5	17	Auditor
%25,9	14	Certified Accountant
%33,3	18	Company Accountant
%100	54	Total

We observe from the table above that the majority of the surveyed professionals hold the position of company accountant (33.3%), followed by those holding the position of auditor (31.5%), then those holding the position of certified accountant (25.9%), and finally, those holding the position of accounting expert (9.3%.(

Third: Years of Experience: The following table shows the distribution of the study sample by years of experience:

Table 6: Distribution of the Study Sample by Years of Experience

%	repetition	Years of experience
% 9,3	5	under 5 years
% 37,0	20	From 6 to 10 years
% 42,6	23	From 11 to 20 years old
% 11,1	6	More than 20 years
100%	54	Total

Source: Prepared by the researchers based on SPSS V23 results.

Regarding the variable of years of experience, we observe from the table above that the majority of the study sample have between 11 and 20 years of professional experience, with 23 individuals (42.6%). This greater experience in their respective professions increases the reliability of their responses. The second largest group was those with 6 to 10 years of experience, comprising 20 individuals (37%). The third largest group was those with more than 20 years of experience, with 6 individuals (11.1%). The smallest group was those with less than 5 years of experience, with 5 individuals (9.3%.(
Fourth: Your knowledge of digital technology. The following table shows the distribution of the study sample according to company ownership:

Table 7: Distribution of the study sample according to your knowledge of digital technology.

%	repetition	Learn about technology
% 31,5	17	weak
% 38,9	21	middle
% 25,9	14	good
% 3,7	2	excellent
% 100	54	Total

Source: Prepared by the researchers based on SPSS V23 results.

As shown in the table above, regarding the variable of digital technology awareness, the majority of the study sample have a moderate level of awareness of digital technology, with 21 respondents (38.9%). The second group, with a weak level of awareness, comprised 17 individuals (31.5%). The third group, with a good level of awareness, consisted of 14 individuals (25.9%), while the last group, with an excellent level of awareness, comprised only two individuals (3.7%.(

Presentation and Analysis of the Study Sample's Responses

To analyze the data, a one-sample t-test was used. Before analyzing the study sample's responses to the study variables, we first determined the data distribution and measurement methods. First: Presenting and analyzing the responses of the study sample:

Laboratory tests require that the data follow a normal distribution. This test is essential to determine the type of tests used in the study (parametric and non-parametric). We chose the Kolmogrove-Smirnov test as it is the most commonly used to determine whether the data follows a normal distribution or not, as shown in the following table:

Table 8: Normality Test.

(sig)	Z	Axis number
0,200*	0,083	I
0,200*	0,086	II
0,200*	0,099	Total

Source: Prepared by the researchers based on SPSS V23 results.

The table above tests the following two hypotheses:

H0: The data are not normally distributed.

H1: The data are normally distributed.

The table above shows that the probability values for the study axes are greater than the significance level of 0.05. This indicates that the data follow a normal distribution according to the Kolmogorov-Smirnov test, allowing us to use parametric tests to analyze the data.

The five-point Likert scale was used to determine the method of measuring the data. It is considered an ordinal scale for determining the degree of agreement with the survey questions and is one of the most common scales for providing significance to the arithmetic mean. It consists of five points, from which the respondent selects only one.

When calculating study averages, these averages are sometimes obtained with decimal places. Therefore, we calculate the hypothetical arithmetic mean according to the five-point Likert scale. This is done by first calculating the range of weights between the scores, by calculating the difference between the upper and lower limits of the categories as follows: 5 - 1 = 4. Then, the class length is calculated as follows:

Class length = . To obtain the hypothetical weighted mean, the class length is gradually added to the number of weights of the categories, starting from the first category number to the last. Based on this, the direction of agreement is determined, as shown in the following table:

Table 9: Distribution of the Five-Point Likert Scale.

Strongly agree	agree	neutral	Disagree	Strongly disagree	Measurement degree
5	4	3	2	1	the weight
[5 - 4.2]	[4.2-3.40]	[3.40-2.6]	[2.6-1.80]	[1.80-1]	Weighted average
Very high	High	Medium	low	Very low	Approval trend

Source: Prepared by the researchers using a five-point Likert scale.

Presentation and analysis of the study sample's responses regarding the first axis: The responses of the study sample were analyzed using a one-sample t-test, as shown in the following table, to determine the degree and direction of agreement with these statements:

Table 10: Presentation and analysis of the study sample's responses.

First point: Accountants possess sufficient knowledge of the characteristics and uses of blockchain technology.					
Degree of approval	Approval trend	standard deviation	arithmetic mean		N
Medium	neutral	1.008	2.76	I have sufficient knowledge about blockchain technology.	1
Medium	neutral	0.972	2.87	Blockchain technology can be applied in my field of work.	2
Medium	neutral	0.915	3.26	I realize that blockchain technology is the future of accounting information systems.	3

Medium	neutral	0.933	3.19	I have positive expectations regarding the application of blockchain technology.	4
Good	Agreed	0.966	3.46	I have a desire to use blockchain technology.	5
Medium	Medium	neutral	3.15	I have sufficient scientific qualifications to use blockchain technology.	6
Medium	neutral	0.658	3.11	General trend	

Source: Prepared by the researchers based on SPSS V23 results.

As can be seen from the table above, the majority of the arithmetic means fall within the neutral category, with low standard deviations. This indicates a lack of significant dispersion in the study sample's responses, suggesting that the participants expressed a neutral opinion on most statements in this first axis. All responses ranged between 2.76 and 3.46, meaning most were neutral on some statements and agreeable on others. Items 5 and 3 had the highest arithmetic means of 3.46 and 3.26, respectively, while item 1 had the lowest value at 2.76. The overall average for this axis was 3.11, reflecting a general trend in understanding blockchain technology.

-Presentation and analysis of the responses of the study sample regarding the second axis.

The arithmetic mean of the statement was determined, then the calculated t-value was compared with the tabulated t-value. The following table shows the analysis of the statements of the second axis of the questionnaire:

Table 11: Presentation and analysis of the responses of the study sample.

The second point: Accountants have an understanding of the impact of blockchain technology on the accounting profession.					
Degree of approval	Approval trend	standard deviation	arithmetic mean		N
Good	Agreed	0.906	3.52	Blockchain technology reduces the time required to record financial transactions.	1
Good	Agreed	0.942	3.59	Relying on blockchain technology transforms accounting documents, invoices, and contracts into digital formats on the internet.	2
Medium	neutral	0.944	3.30	Blockchain technology reduces the number of accountants and staff required to perform and distribute financial tasks, resulting in more precise tasks.	3
Good	Agreed	0.883	3.44	Blockchain technology is bringing about changes in the field of accounting in a faster and more flexible way than traditional archiving methods.	4
Medium	neutral	0.960	3.15	Blockchain technology avoids errors that occur when human intervention occurs in the verification process.	5

Medium	neutral	1.015	3.37	Blockchain technology enables the provision of instant financial reports at any point in time – online reports.	6
Medium	neutral	0.991	3.33	Blockchain technology prevents manipulation and falsification of financial data and information.	7
Medium	neutral	0.983	3.30	Blockchain technology helps improve the accuracy and reliability of accounting records.	8
Medium	neutral	1.031	3.35	Using blockchain technology significantly reduces tax evasion.	9
Medium	neutral	0.932	3.33	Blockchain technology is impacting accounting, shifting from double-entry to triple-entry bookkeeping.	10
Good	Agreed	0.906	3.48	Using blockchain technology reduces the costs of accounting books and paper used in the documentation process.	11
Good	Agreed	0.966	3.48	Accounting information can be accessed transparently by all parties (accountant, client, auditor, etc.)	12
Medium	neutral	0.711	3.38	General trend	

Source: Prepared by the researchers based on SPSS V23 results.

As shown in the table above, the majority of the arithmetic means fall into the category of disagreement, with a low standard deviation. This indicates a lack of significant dispersion in the responses of the study sample, suggesting that the participants agree with all statements in this second axis. Item 2 in this axis achieved the highest arithmetic mean score of 3.59, indicating that relying on blockchain technology digitizes accounting documents, invoices, and contracts on the internet. Item 5 in this axis had the lowest value of 3.15, meaning that the participants believe blockchain technology avoids errors that occur when human intervention is involved in the documentation process. The overall axis mean of 3.38 indicates that the participants have a moderate understanding of the impact of blockchain technology on the accounting profession.

This section tests the study hypotheses describing the study variables using standard statistical methods applied in inferential statistics. First: Testing the Hypotheses Related to Describing the Study Variables

Before testing the hypotheses, most tests require knowledge of the data distribution. This test is essential for hypothesis testing. As previously mentioned, we reviewed the Kolmogrove-Smirnov test, which shows that the data used in this study follows a normal distribution. This allows us to use parametric tests and test the study hypothesis.

-Testing the First Main Hypothesis:

Therefore, we will test the hypotheses describing the study variables using a one-sample t-test from the accountants' perspective, as follows:

First: Testing the First Hypothesis

The first hypothesis states the following:

H0: Accountants in Algeria lack awareness of the characteristics of blockchain technology in the accounting profession.

H1: Accountants in Algeria possess an awareness of the characteristics of blockchain technology in the accounting profession. The following table shows the results of the one-sample t-test for testing the first main hypothesis related to the first axis of the accountants' questionnaire:

Table 12: Results of the t-test for testing the first main hypothesis.

decision	Degree of approval	(sig)	tabulated t value	Calculated t value	standard deviation	arithmetic mean	Hypothesis
The hypothesis is rejected.	Medium	0,104	3,442	1,28	0,658	3,11	H_1
Significance level: α = 0.05 DF = N-1 = 54							

Source: Prepared by the researchers based on the results of Minitab V18.

From the values in the table above, it is clear that the arithmetic mean of the variable (Accountants in Algeria have an understanding of the characteristics of blockchain technology in the accounting profession) belongs to the third category of the five-point Likert scale. This reflects the degree of neutrality of this hypothesis from the accountants' perspective. The calculated t-value was 1.82, which is less than its critical value of 3.442. The probability value is greater than the significance level of 0.05. Therefore, the alternative hypothesis is rejected, and the null hypothesis (H1) is accepted.

Second: Testing the second hypothesis

H0: Blockchain technology does not affect the accounting profession.

H1: Blockchain technology affects the accounting profession.

The following table shows the results of the one-sample t-test for the second hypothesis, which relates to the mean of the second axis of the questionnaire:

Table 13: Results of the t-test for the second hypothesis.

decision	Degree of approval	(sig)	tabulated t value	Calculated t value	standard deviation	arithmetic mean	Hypothesis
The hypothesis is acceptable.	Medium	0,000	2,001	4,000	0,711	3,38	H_1
Significance level: α = 0.05 DF = N-1 = 54							

Source: Prepared by the researchers based on SPSS V23 results.

From the table above, it is clear that the arithmetic mean value for the variable "Blockchain technology affects the accounting profession" belongs to the third category of the five-point Likert scale. This reflects the degree of agreement with this hypothesis. The calculated t-value was 4.000, which is greater than its critical value of 2.001, and the probability value is less than the significance level of 0.05. Therefore, the alternative hypothesis H1 is accepted, and the null hypothesis H0 is rejected. That is, "Blockchain technology affects the accounting profession," according to the opinions of the study participants.

Third: Testing the third hypothesis

Hypothesis states:

H0: There is no statistically significant relationship between the sample's awareness of information technology developments and their awareness of the impact of blockchain technology on the accounting profession.

H1: There is a statistically significant relationship between the sample's awareness of information technology developments and their awareness of the impact of blockchain technology on the accounting profession. The following table shows the results of the one-sample t-test for the third hypothesis, which relates to the mean of the second axis of the questionnaire:

Table 14: Results of the t-test for the third hypothesis

Sig	Value T	value of β	Beta tethering direction	Significance level of F value	Coefficient of determination R2	Correlation coefficient R	Hypothesis
0.000	7.259	0.598	2.199	0.000	0.509	0.709	1

Source: Prepared by the researchers based on SPSS V23 results.

The table above shows a high coefficient of determination (CVD) of 0.509, meaning that the independent variable explains 50% of the variance in the dependent variable. The T-value and significance level of 0.000 (less than 0.05) indicate the test's significance. Therefore, the alternative hypothesis H1 is accepted, and the null hypothesis H0 is rejected. This means that "there is a statistically significant relationship between the sample's awareness of information technology developments and their understanding of the impact of blockchain technology on the accounting profession," according to the opinions of the study participants.

.4Conclusion: This study aimed to address a highly important topic related to institutions seeking to modernize their accounting systems. It reveals the extent of knowledge Algerian accounting professionals possess regarding modern technologies used in their profession. This is achieved by focusing on the following main question: To what extent are financial accountants aware of blockchain technology? This topic was addressed by providing a theoretical foundation on blockchain technology and its relationship to accounting. Additionally, a field study was conducted to determine the level of awareness among accounting professionals regarding the characteristics and uses of blockchain technology, as well as its impact on the profession. The study, conducted using a random sample, yielded the following results:

-Blockchain technology is still in its early stages in Algeria. Therefore, the study participants have a moderate understanding of its characteristics and uses.

-Regarding their understanding of the impact of blockchain technology on the accounting profession, participants expressed reservations. This is because the technology is unfamiliar to them, and they have not yet used it, making it difficult for them to judge it positively or negatively without direct experience.

-Blockchain technology is a novel technology that helps reduce time and costs, in addition to increasing the efficiency and effectiveness of various transactions.

-Blockchain technology is bringing about radical changes in the field of accounting by providing a faster and more flexible archiving method compared to traditional methods, thanks to its decentralized and distributed system.

-The application of blockchain technology to the accounting profession in Algeria faces a number of challenges, such as reliance on the internet. - A direct correlation exists between the sample group's awareness of information

technology developments and their understanding of the impact of blockchain technology on the accounting profession.

Recommendations:

In conclusion, we will attempt to offer some recommendations that we deem appropriate given the importance of modern technologies in the field of accounting, especially blockchain technology, which we consider the future that most Algerian institutions will adopt. To enhance awareness among accountants, we offer the following recommendations, which stem from the study's findings:

-Qualifying and training accountants on modern and contemporary technologies, including blockchain technology (with an understanding of its characteristics and applications), is crucial. This will enhance their skills and ability to adapt to the changing demands of the profession.

-Incorporating new modules into accounting curricula is essential to focus on modern technologies in the field of accounting, given their significant role in developing the profession. Students must be equipped with the knowledge and skills related to these technologies.

-Connecting researchers in the field of information technology with accountants is necessary.

-Encouraging more research in the field of digitalization is essential, through increasing the number of conferences and scientific seminars dedicated to modern technologies related to the accounting profession. - Adopting a collaborative approach between academics and professionals is essential to keep pace with the latest developments in the accounting profession, and this can be achieved through joint work.

-The accounting profession in Algeria needs to be developed to keep up with modern developments.

-Accountants and auditors must deepen their knowledge of blockchain technology because the design of future financial systems will require financial experts who combine financial expertise with in-depth knowledge of the technology.

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