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USING ARTIFICIAL INTELLIGENCE AND BLOCKCHAIN DIGITAL TECHNOLOGY IN ACCOUNTING WITH THE AIM OF INCREASING TRANSPARENCY AND EFFICIENCY

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Abstract
Today, digital technology has entered various sciences and has led to the growth of their efficiency. In this research, using a quantitative-qualitative method, the effect of using digital technology such as artificial intelligence and blockchain in the accounting process was studied with the aim of increasing transparency and efficiency. The accountants' society of Iraq, as the accountants' union, was chosen as the statistical society. Sampling was accessible and purposeful. In the quantitative part, ten people and in the qualitative part one hundred people agreed to cooperate, and there were no common members between the two communities. The found factors include 1. providing suitable software, with sub-factors of simplicity in use, installation, calculations and recording with high reliability; 2. Increasing speed with secondary factors of speed in calculations, recognition of conflicts, timely notification of errors and speed in analysis; 3. Recognizing conflicts with the sub-factors of numerical, qualitative, management and development conflicts and 4. Intelligent calculations with the sub-factors of timely declaration of conflict, periodic declaration of conflict, periodic analysis and reporting in plain language were determined.

Keywords: Accounting efficiency, Transparency, Digital technology, Blockchain, Artificial intelligence.

Introduction

The evolution and enhancement of operational methods have always been a priority for industry leaders. The advent of digital technology in everyday life has revolutionized human existence. Despite the minor challenges posed by these technologies, they offer numerous advantages. Speed, error reduction, system development, and more are among the benefits of these technologies (Krichen et al., 2022).Accounting and auditing mechanisms have not been unaffected by these

developments, with traditionally complex and error-prone processes being transformed into simpler, error-free operations. In the past, accounting and auditing were extremely complicated and arduous tasks, as calculations were performed manually, leaving room for errors at any moment. Today, these error probabilities have been minimized to nearly zero (Gherkhali et al., 2020).The issue of transparency and efficiency has become a prominent focus for accounting researchers. This issue is of such significance that accounting committees have been established solely to oversee it. Company owners have always been concerned with this matter. Enhancing the performance of accounting, for which costs have been incurred, holds great importance.

Conducting this research is important because there is still no established procedure regarding the application of digital technology in accounting. Unfortunately, some traditional viewpoints resist changes in accounting practices. However, using digital technology is considered relatively straightforward. If its impact on efficiency and transparency can be demonstrated, the intended goal can be achieved in the simplest way possible. Therefore, this research is significant from both theoretical and practical perspectives.Previous blockchain research has mainly focused on legal issues. It is worth noting that the tools for generating cryptocurrency and smart contracts are based on blockchain technology. This technology enables relatively accurate predictions in calculations (Liang, 2022).The researcher decided to carry out this study using a mixed quantitative-qualitative method. Auditors from Iraq were invited for interviews, and their initial opinions were recorded. Then, a selected number of participants were chosen for further questioning. Ultimately, these factors were organized into a comprehensive model that was designed and introduced.

2.. Literature and Theoretical Framework

Digital currency is a type of electronic money designed to increase security, eliminate intermediaries, and ensure anonymity. Cryptocurrencies are currencies that use cryptography for online transactions, making them unhackable and untraceable. Cryptography was first used during World War II for the transmission of military messages and commands. The first digital currency, Bitcoin, was created in 2009 and is now considered the king of the digital currency world (Wu, 2017: 35). In recent years, many cryptocurrencies have been introduced and released. Currently, more than 1,000 cryptocurrencies are traded in global markets. Cryptocurrencies are designed for security and anonymity; no one owns them, and they cannot be stopped or hacked. They are decentralized and eliminate intermediaries.

Cryptocurrencies use decentralized technology, allowing users to make secure payments and store money without needing to register through banks or intermediary organizations. Most cryptocurrencies operate on a distributed database called blockchain. Most primary cryptocurrency units (except tokens) are produced through a process called mining.

Cryptocurrency is a type of virtual currency that uses cryptography in its design and is usually managed in a decentralized manner. Since cryptocurrencies are a new phenomenon and new examples continue to emerge, their definitions vary across different sources, and repetitive explanations are avoided (Saleh Abadi, 2021: 98).

The blockchain technology was first introduced in the 1990s and after the great global economic crisis of 2009, a decentralized cryptocurrency called Bitcoin, based on blockchain technology, was introduced by an anonymous individual or group under the pseudonym "Satoshi Nakamoto." Various attempts have been made by institutions to identify this individual or group, but accessing this identity has become increasingly complex with each attempt (Samiei, 2021: 98).

The security of this cryptocurrency is guaranteed by cryptographic algorithms, based on which a specific and limited amount of Bitcoin can be produced each day. The anonymous Satoshi Nakamoto's goal was to prevent excessive money production by governments and to create trust based on cryptographic algorithms, which is considered the most optimistic rationale for this cryptocurrency's existence. At its inception, Bitcoin had little value since the general public did not accept it. However, over time, as trust grew, its price increased, and it has now become one of the most powerful currencies in the world.

2-1. Mining

Cryptocurrencies are generated through a process called mining. In this process, computers attempt to solve complex mathematical puzzles known as "hashes." Individuals worldwide strive to be the first to solve these hashes, and whoever successfully does so receives a certain amount of cryptocurrency as a reward. This process requires specialized hardware that operates continuously. Therefore, even if a computer has a fast graphics card, it is unlikely to succeed in mining. Besides mining, there are other ways to obtain cryptocurrencies. The easiest way is to purchase them through online stores, and afterward, they can be traded with other users. Similar to gold, stocks, and many other assets, cryptocurrency prices are determined by supply and demand, leading to significant fluctuations in their value (Salas, 2019: 42).

2-2. Blockchain

The literal meaning of blockchain is a chain of blocks. Blockchain is a place where all information and every single bit of Bitcoin and other supported currencies are stored. This system acts as a permanent database for Bitcoin transactions worldwide. In other words, it is a ledger that records transactions chronologically. Bitcoin users can have multiple accounts without any user details being registered in them (Nobitex website). Creating these accounts does not require any fees. Every computer connected to the Bitcoin network receives a copy of the blockchain.

Among all the new technologies and protocols mentioned, from WebRTC to high-speed 5G networks and even artificial intelligence and chatbots, none has seen as much fluctuation as blockchain. Interestingly, some experts believe that blockchain, among the aforementioned technologies, is the one most capable of having a noticeable impact on the internet and VoIP. This new, and to some extent mysterious, technology gained its popularity through interactions with Bitcoin, as one of the main processes behind Bitcoin transactions (Vahidpanah, 2021: 68). Initially, it was thought that blockchain technology could only be used in connection with Bitcoin, but "Richard Muller," the Chief Executive Officer of Sealza, an electronic security company, stated: "Blockchain has the potential to increase people's trust in the internet, in a way that not only can it connect objects to each other and the internet, but it can also serve as a mediator for financial transactions between people and various objects. While at first blockchain seemed like a hypothesis, time showed that major financial institutions and large banks became interested in this technology and are looking to adopt it. The key issue here is just time, as various industries will gradually incorporate blockchain into their infrastructures on a large scale."

Smart contracts are decentralized agreements that are created through computer codes and stored on the blockchain. These contracts are the result of long-term efforts to eliminate potential inefficiencies in traditional contracts. The technology used in smart contracts is an advanced form of electronic data transfer technology. This technology was designed in the 1970s to achieve certain objectives, such as eliminating the need for traditional paper contracts. However, at the time, the technology was not accepted due to reasons like its inability to support large-scale financial transactions and integrate with participants' information systems. Later, the invention led to the creation of a new generation of electronic contracts called smart contracts, whose implementation on the blockchain infrastructure made them immune to the issues associated with the earlier technology (Naser, 2018: 43).

2.3 Blockchain

In addition to recording information and even cryptocurrencies, blockchain also has the capacity to facilitate large-scale financial contracts in the form of smart contracts. Smart contracts are agreements made on this platform under the supervision of artificial intelligence and the governing authority, where the consideration in these contracts is digital cryptocurrencies or smart assets. Smart assets are assets whose information is registered in an encrypted form on the blockchain by competent authorities and officially recognized by the government. If a property is not officially recognized by the government and its information is not registered on this platform, it cannot be transferred through smart contracts (Naser, 2018: 49).

Blockchain technology, whether based on Bitcoin, Ethereum, or other similar software protocols, is widely referred to as distributed ledger technology. It

demonstrates stability and supports smart contracts. Generally, this technology refers to extensive computer hardware in peer-to-peer networks that ensures transparency and security in the transfer and storage of information. This system acts as a permanent transaction management system, using a mutual consensus mechanism instead of a trusted third-party intermediary for domestic or cross-border transactions. In other words, concluding transactions through this system allows the process to be monitored by artificial intelligence from the moment negotiations begin between the parties until the contract is finalized and signed. Ultimately, for the contract to be recorded on the public ledger, it requires final approval from the artificial intelligence after reviewing the contract. This oversight mechanism occurs based on instructions given to the artificial intelligence, guaranteeing the execution of the contract. Additionally, this platform is global and not limited to one or a few countries. Furthermore, payments in contracts made through this platform are made directly from electronic wallets or cloud-based accounts without the need for an external intermediary, such as a bank, which is one of the advantages of protecting these contracts from bankruptcy or banking sanctions.

In the world of e-commerce, a smart contract is a computer protocol or algorithm that, according to the instructions provided, can verify, limit, or enforce the terms of the contract. Blockchain-based platforms such as Bitcoin blockchain or Ethereum blockchain serve as decentralized public ledgers containing cryptocurrencies, allowing holders of these currencies to enter into electronic contracts under the authorization of competent authorities. In return for the transfer of ownership of a desired item, payment can be made using virtual currencies. Blockchain is a decentralized digital ledger containing encrypted cryptocurrencies with numerous legal and non-legal applications. The primary function of this ledger in legal fields is to record information, transfer data, and enforce contract terms. Each block contains recorded information, and each chain connects the blocks through a "hash" function. Smart contracts are executed on this platform. Generally, smart contracts can be defined as contracts made on the blockchain platform, where the consideration consists of virtual currencies or smart assets. Smart assets refer to properties that have been officially recognized by the government and whose information has been registered in the network in the form of readable encrypted codes. Smart contracts are made under the supervision of competent authorities and artificial intelligence, and after being signed by the parties, they are reviewed by artificial intelligence. If the terms of the contract comply with the instructions given, the contract will be approved, executed, and recorded in readable codes within the blocks of the chain (Zarei, 2019: 67).

2.4. Research Background

Moradzadeh (2016), in a study titled "Bitcoin in the Global Economy," stated that Bitcoin is an innovation arising from the expansion of the internet and, due to its

economic functionality, is one of the subjects of social sciences. In social sciences, the context of the subject under study is of equal or perhaps greater importance than the subject itself. Bitcoin is the realization of an economic idea in the form of a computer program, and without societal adoption, it would have been forgotten in the computer. However, Bitcoin quickly gained acceptance from society. In other words, a few years ago, knowledge of how to use Bitcoin was limited to a small group of internet enthusiasts, but today, the size of the Bitcoin market is larger than the stock market of some small and medium-sized nations. The value of Bitcoin, like other currencies, is determined by supply and demand, and it has experienced significant growth and volatility. Despite the rapid growth of Bitcoin compared to when it first launched, its use has remained limited to a specific market. The total amount of Bitcoins that can be produced is contractually capped at 21 million. It is predicted that by the year 2140, the contractual ceiling for Bitcoin production will be reached. Since each Bitcoin is divisible up to eight decimal places, the total number of Bitcoins that can be spent will exceed two thousand trillion. An analysis of Bitcoin's value fluctuations over a one-year period, in terms of dollars, shows that two main factors have had a noticeable impact on Bitcoin. The first factor, which has had a lesser impact, is technological. The second, and more significant factor, is government interventions and global powers' reactions through regulation in this field, which has had a major influence on Bitcoin's trajectory. It is still expected that governmental regulations will continue to play a pivotal role in Bitcoin's future development.

Forghandoost Haghighi and Nadaf (2018), in a study titled "A Review of Cryptocurrencies, Opportunities, and Threats," mentioned that following the financial crisis and the loss of trust in central institutions in 2002, global financial markets faced a new phenomenon called virtual or cryptocurrencies. In a very short time, these types of currencies found their place in people's daily transactions. Although governments have been resistant to accepting these currencies and there are conflicting responses, inventors of these currencies and financial actors have been working to overcome the challenges and create financial innovations in this field, aiming to expand this phenomenon. In recent years, the use of this new payment method has also grown in Iran. Due to their peer-to-peer and decentralized nature, which eliminates intermediary oversight institutions, these currencies create both opportunities and threats. The number of virtual currencies in the world is increasing, among which Bitcoin stands out as the most widely used and valuable virtual currency in the real world. Bitcoin is a public internet system that has introduced an electronic system for payment and currency production.

Mosalli and Sharifi (2020), in a study titled "Bitcoin and Its Impact on E-Commerce," stated that Bitcoin is a virtual currency, the production of which is the result of time-consuming computational activity known as mining. This international currency is not managed by any bank and can be used to purchase

goods from anywhere in the world. Additionally, it can be traded like stocks or precious metals. The main objective of this article is to discuss Bitcoin as a virtual currency from the perspective of a user, while also addressing goals such as introducing Bitcoin to those unfamiliar with it, attracting talented individuals, and showcasing the capabilities of Bitcoin in the virtual world and e-commerce.

Asgari (2021), in a study titled "The Relationship between Currency and Cryptocurrency in the Iranian Legislative System," stated that their research aims to examine the concept of currency in Iran's legal system and clarify its conceptual relationship with what is today known as cryptocurrency or virtual currency. Understanding this relationship is crucial because if the concept of currency aligns with that of cryptocurrency, then cryptocurrency transactions would also be subject to the legal provisions related to currency transactions, including the requirement for Central Bank authorization and compliance with government regulations. This article, using an analytical approach and library resources, demonstrated that none of the legal elements defining currency—namely being money, legal tender, and foreign—apply to what is currently recognized as cryptocurrency. The legal conceptual relationship between the two is one of incompatibility. As a result, under the current circumstances, the principle of legal validity and permissibility governs cryptocurrency transactions, and such transactions are not subject to legal prohibitions that could nullify the transaction or punish the offender. The freedom and validity of cryptocurrency transactions, despite certain prohibitions and invalidations in some cases, present challenges, especially considering that cryptocurrency transactions without regulations could have a more significant impact on economic instability than traditional currency transactions. The article recommends urgent legislative action to apply the rules governing currency transactions to cryptocurrency transfers under a temporary, single article law as a minimum step. Additionally, independent and comprehensive regulation regarding the extraction and transfer of cryptocurrency within the Iranian legislative system is proposed as the ultimate goal.

Chen et al. (2017), in a study titled "A Payment Monitoring System Based on Blockchain Technology Using Bitcoin Digital Wallet," mentioned that after years of development and extensive research on digital currency, the most well-known chain in the industry is Bitcoin, which has gradually advanced in fields like mining, exchange, currency conversion, ATMs, digital wallet design, and more. Particularly, its blockchain technology has developed into FinTech business organizations in the field of commerce and research, and it is also being used in interdisciplinary fields like medical science, supply chains, and the Internet of Things. Digitization of currency can solve many of the existing problems with physical currency, such as the prevalence of counterfeit notes. As a result, not only can transaction transparency be stored in shop records, but customers' rights and interests can also be protected while using digital wallets. For governments, the regulation and auditing of financial transactions could also become simpler and more convenient, especially concerning tax collection.

Vranken (2017), in a study titled "Bitcoin Sustainability and Blockchain," stated that Bitcoin is an electronic currency that has gained increasing popularity since its introduction in 2008. Transactions within the Bitcoin system are stored in a public transaction ledger (blockchain), which is decentralized and operates on a peer-to-peer network. Bitcoin provides decentralized currency issuance and transaction authorization. The security of the blockchain relies on a computationally intensive algorithm for mining Bitcoin, which prevents double-spending and tampering with verified transactions. This "proof-of-work" algorithm is energy-intensive, and the actual amount of energy consumed is a matter of debate.

Kristoufek (2018), in a study titled "On the Efficiency (Inefficiency) of Bitcoin Markets and Its Evaluation," analyzed the efficiency of two Bitcoin markets (relative to the U.S. dollar and Chinese yuan) over time. Since inefficiency can be demonstrated through various channels, an efficiency index was used, which covers different efficiency (inefficiency) measures. Strong evidence was found that both Bitcoin markets were inefficient between 2010 and 2017, except for a few periods of calm following bubble-like price increases.

Gil-Alana et al. (2020)**, in a study titled "Cryptocurrency Markets and Country Regulations," analyzed the time series of Bitcoin and Ethereum using univariate analysis. It was found that the null hypothesis of a unit root could not be rejected for both Bitcoin and Ethereum. In contrast, for Litecoin, Ripple, and Stellar, the level of integration was significantly higher than one. However, in the case of Tether, there was evidence of mean reversion. Regarding stock market indices, the results were more homogenous, and a unit root could not be rejected for any time series (except for the VIX, which showed mean reversion). In the bivariate analysis of cryptocurrencies and stock market indices, no evidence of convergence was found. This suggests that cryptocurrencies are distinct from traditional economic and financial assets. The findings of this article highlight the important role of cryptocurrencies in investors' portfolios, as they provide a diverse option and confirm that cryptocurrencies represent a new class of investment assets.

3.Research Methodology

This research is applied in nature in terms of its objective and uses a mixed-method approach. This means that both quantitative and qualitative methods were utilized for the research. First, by studying the theoretical foundations, a general understanding of the efficiency of digital technology in auditing was obtained, and then the ambiguous points were prepared and formulated as interview questions (Appendix 1). After conducting interviews with the members of the quantitative section, some of the questions were answered, and the factors were listed. Based on these, a questionnaire was designed, and the qualitative section began (Appendix 2). In the qualitative section, the respondents answered the questionnaire, and through analysis, the factors were ranked. The interview questions and the questionnaire were validated by several accounting experts and

professors, ensuring their validity. The reliability of the questionnaire was measured using Cronbach's alpha, confirming the overall credibility of the research tools.

The statistical population for the quantitative section includes all members of the accounting community in Iraq who held positions until 2023. In the qualitative section, the same population was used, with the exception that members of the quantitative group were excluded. Sampling was conducted using the convenience sampling method, with interview attempts made only once.

In the end, 10 individuals agreed to participate in the interviews, and 100 completed questionnaires were returned. A visit was made to the office of the accounting community, and upon presenting a letter from the university, cooperation was requested, which was largely satisfactory.

As stated earlier, the basis for the interviews was the ambiguities that arose after studying the theoretical foundations related to the research. Based on this, interview questions were prepared in line with Appendix 1, and ultimately, interviews were successfully conducted with 10 members of the statistical population, the details of which are shown in Table 1. The interview questions were validated by accounting experts and professors, ensuring their validity.

Table 1. Interviewees' Details

Position	Number (People)
Senior Auditor	2
Regular Auditor	3
Community Managers	4
Accounting Professors	1
Total	10

By analyzing the interview transcripts, four main factors were identified, each having four sub-factors, resulting in a total of 16 factors. The designed questionnaire measured each factor with one question, totaling 16 questions, which were validated by management experts. Table 2 provides the details of the respondents, and Table 3 presents Cronbach's alpha as the reliability measure of the questionnaire, indicating its validity for the research.

Table 2. Respondents' Details

Position	Number (People)
Senior Auditor	5
Regular Auditor	40
Researcher	15
High-ranking Institution Managers	15
Low-ranking Institution Managers	25
Total	100

Table 3. Questionnaire Questions and Their Reliability

Questionnaire Questions	Cronbach's Alpha	Result
16	0.82	Validated

Contrary to probabilistic sampling methods, where the goal is to generalize the results from a representative sample to the entire population, in qualitative research, this goal is not the focus. The criterion here is to describe or explain a phenomenon as comprehensively as possible. Therefore, a criterion is introduced in which reaching maximum information about the phenomenon is considered the endpoint. This criterion is known as saturation in the context of qualitative research. Data saturation or theoretical saturation is an approach used in qualitative research to determine the adequacy of sampling. Theoretical saturation is more closely related to theoretical sampling, which is used in grounded theory (Dimitropoulos, 2020).

More precisely, it must be said that the characteristics of a theoretical category have reached saturation. This occurs when no further data enters the research that would develop, modify, expand, or add to the existing theory. In this situation, new data coming into the research neither changes the existing categories nor suggests the creation of a new category. In fact, according to Strauss and Corbin, it is the categories that reach saturation (Ibid).

Both Bieber in 2008 and Smith in 2009 stated that the reason for the emergence of this method was the felt need by qualitative researchers. With the development of qualitative methods, efforts to systematize methods and define explainable criteria increased. Consequently, the use of data saturation was employed in various strategies of qualitative research and became the "gold standard" for ending sampling in qualitative studies. Although this method was initially used in grounded theory, it was later applied in other qualitative research strategies that are not based on theory building, under the name of data saturation. According to one definition, saturation is reached when all information sources provide similar information (Site for Quantitative and Qualitative Research).

One criterion for discovering saturation is the repetition of previous data, where the researcher continuously encounters repeated data. For example, when in ongoing interviews, the researcher repeatedly hears similar words and opinions, they may suspect that data saturation has been achieved. Nevertheless, it is suggested that after the researcher feels that the obtained data are being repeated, a few additional interviews should be conducted to confirm this belief.

4. Findings

The researcher-made questionnaires, validated for reliability and validity, were distributed among the sample members. In this section, first, the descriptive statistics of the quantitative and qualitative parts are explained. Then, using the

Delphi technique, the obtained results were validated for reliability. Afterward, the derived factors were ranked, and finally, the desired model was designed.

4-1. Descriptive Statistics

The descriptive statistics are presented separately for the two sections.

4-1-1. Quantitative Section

As stated, among the members of the statistical population, interviews were conducted with ten individuals, and the descriptive statistics of this part of the research are shown in Table 4. Most of the interviewees had appropriate experience and educational backgrounds.

Table 4. Descriptive Statistics of Interview Section

Row	Position	Age	Experience (Years)	Field of Study	Education
1	Senior Auditor	45	19	Accounting	PhD
2	Senior Auditor	48	15	Accounting	Master's Degree
3	Regular Auditor	40	17	Accounting	Master's Degree
4	Regular Auditor	38	15	Accounting	Master's Degree
5	Regular Auditor	35	12	Accounting	Master's Degree
6	Community Manager	39	10	Accounting	Master's Degree
7	Community Manager	40	11	Economics	Master's Degree
8	Community Manager	35	12	Economics	Master's Degree
9	Community Manager	32	11	Accounting	PhD
10	Accounting Professor	29	10	Accounting	PhD

4-1-2. Qualitative Section

Table 5. Age of Respondents

Position	20-25		26-35		36-45		46-55		56-65	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Senior Auditor	1	1	2	2	2	2	0	0	0	0
Regular Auditor	5	5	15	15	10	10	5	5	5	5
Researcher	3	3	2	2	5	5	3	3	2	2
Top-level Managers	1	1	4	4	7	7	3	3	0	0
Low-level Managers	3	3	4	4	8	8	5	5	5	5
Total	13	13	27	27	32	32	16	16	12	12

Table 6. Education of Respondents

Position	Diploma		Associate Degree		Bachelor's Degree		Master's Degree		PhD	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Senior Auditor	0	0	0	0	1	1	3	3	1	1
Regular Auditor	0	0	0	0	32	32	8	8	0	0
Researcher	0	0	0	0	10	10	5	5	0	0
Top-level Managers	0	0	0	0	8	8	7	7	0	0
Low-level Managers	0	0	0	0	10	10	13	13	2	2
Total	0	0	0	0	61	61	36	36	3	3

Table 7. Work Experience of Respondents (Years)

Position	10-5		11-15		16-20		21-25		26-30	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Senior Auditor	4	4	1	1	0	0	0	0	0	0
Regular Auditor	20	20	10	10	10	10	0	0	0	0
Researcher	5	5	3	3	2	2	0	0	0	0
Top-level Managers	3	3	2	2	1	1	3	3	2	2
Low-level Managers	5	5	5	5	8	8	4	4	3	3
Total	37	37	21	21	21	21	7	7	5	5

4-2. Initial Analysis

The first analysis was conducted in the section on theoretical studies, where the findings were analyzed and based on these, the interview questions were designed. After the interviews, the responses were analyzed, and using the Delphi technique shown in Table 8, the validity of the determined factors was confirmed. Here, the format and foundation of the influential factors were examined. After the initial determination of interview results, the questionnaire results were statistically extracted, and ranking was performed based on these results. Table 9 shows the initial ranking based on the average of the responses. For an accurate review of the ranking, the Friedman ranking test was used, as shown in Table 10.

Table 8. Analysis of Interview Results Using Delphi Method

Influential Factor	Management Trend	Confirming Experts	Successful Experiences	Result
Suitable software development	Ease of use	3 people	Iran	Confirmed
	Ease of installation	5 people	Italy	Confirmed
	Ease of calculations	6 people	France	Confirmed
	Reliable registration	2 people	Iraq	Confirmed
Speed improvement	Speed in calculations	7 people	Iraq	Confirmed
	Speed in conflict detection	3 people	Iran	Confirmed
	Timely error reporting	5 people	Egypt	Confirmed
	Speed in analysis	6 people	Lebanon	Confirmed
Conflict identification	Numerical conflicts	2 people	Iran	Confirmed
	Qualitative conflicts	7 people	Italy	Confirmed
	Managerial conflicts	3 people	France	Confirmed
	Development conflicts	5 people	Iraq	Confirmed
Smart calculations	Timely conflict reporting	6 people	Iraq	Confirmed
	Periodic conflict reporting	2 people	Iran	Confirmed
	Periodic analysis	7 people	Egypt	Confirmed
	Simple language reporting	6 people	Lebanon	Confirmed

Table 9. Average and Standard Deviation of Scores for Main Factors

Group	Statistical Index	Software	Speed	Identification	Calculations
Whole Population	Mean	4.8	3.7	2.2	1.95
	Standard Deviation	0.15	0.16	0.12	0.15

Table 10. Results of the Friedman Test for Ranking Main Factors

Group	Statistical Index	Software	Speed	Identification	Calculations
Whole Population	Friedman Score	4.5	4.25	2.75	2.5
	Rank	1	2	3	4

As mentioned, there were four main factors, each ranked using the Friedman test. For each main factor, four sub-factors were also determined, as shown in Table 8. A survey was conducted on the impact of each factor using a question in the questionnaire. After ranking the main factors, the sub-factors were also ranked and shown in Table 8. With the precise ranking of factors, the Delphi technique was once again applied based on the questionnaire questions to validate the responses provided.

Table 11. Ranking of Internal Factors Based on Friedman Test

Overall Rank	Categories	Rank	Factors	Rank	Factors
1	Software	1	Ease of use	2	Ease of installation
		3	Ease of calculations	4	High reliability of registration
2	Speed	1	Speed in calculations	2	Speed in conflict detection
		3	Timely error reporting	4	Speed in analysis
3	Identification	1	Numerical conflicts	2	Qualitative conflicts
		3	Managerial conflicts	4	Development conflicts
4	Smartness	1	Timely conflict reporting	2	Periodic conflict reporting
		3	Periodic analysis	4	Simple language reporting

Table 12. Delphi Technique in the Questionnaire Section

Development Factor	Management Trend	Consistent Respondents	Delphi 1	Delphi 2	Development Factor	Management Trend	Consistent Respondents	Delphi 1	Delphi 2
Suitable software	Ease of use	1-30	Confirmed	Confirmed	Conflict identification	Numerical conflicts	30-52	Confirmed	Confirmed
	Ease of installation	24-75	Confirmed	Confirmed		Qualitative conflicts	58-69	Confirmed	Confirmed
	Ease of calculations	78-90	Confirmed	Confirmed		Managerial conflicts	36-98	Confirmed	Confirmed
	High reliability of registration	89-100	Confirmed	Confirmed		Development conflicts	75-85	Confirmed	Confirmed
Speed imp	Speed in calculations	36-100	Confirmed	Confirmed	Smart calculations	Timely conflict reporting	36-58	Confirmed	Confirmed
	Speed in conflict detection	36-85	Confirmed	Confirmed		Periodic conflict reporting	48-89	Confirmed	Confirmed
	Timely error reporting	58-75	Confirmed	Confirmed		Periodic analysis	57-96	Confirmed	Confirmed
	Speed in analysis	55-85	Confirmed	Confirmed		Simple language reporting	24-69	Confirmed	Confirmed

5. Summary and Conclusion

To effectively utilize digital technology in accounting, it is essential to design suitable accounting software based on blockchain and artificial intelligence. The software must first be simple to use, secondly easy to install, thirdly capable of performing calculations with ease, and finally ensure high reliability in recording data.

In the next phase, the speed of accounting operations needs to be increased, which is only possible through the correct application of artificial intelligence. This will accelerate calculations, conflict identification, error reporting, and analysis.

Furthermore, it is crucial to identify conflicts in the most efficient way possible. This includes promptly detecting numerical, qualitative, managerial, and developmental conflicts.

Finally, intelligent calculations should be performed without the need for user requests, aiming to report conflicts on time, provide periodic conflict reports, and conduct periodic analysis. The results of these processes should be delivered in simple language.

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Appendix 1: Interview Questions

Greetings and respectful regards. Thank you very much for taking the time to speak with us.

Please share your general opinion on digital technology.
How does digital technology impact transparency in accounting?
What factors influence digital technology?
How can the government strengthen digital technology?
How does duplication in digital technology occur?
Can digital technology enhance the quality of accounting? Please explain.
What are the expected strategies to strengthen digital technology in accounting?
What are the strategies for developing digital technology?
In the absence of digital technology, how can the best strategy be chosen?
How is the interaction between accountants and digital technology facilitated?

Appendix 2: Questionnaire

Dear Respondent,
Greetings, and thank you for taking the time to participate in this study.

The following questionnaire is part of an academic thesis. We kindly ask you to complete it carefully to assist us in conducting this research. Your responses will remain confidential and will only be used for the purpose of the study. You do not need to provide any personal information beyond the general details requested.

We sincerely appreciate your cooperation and support.

General Questions

Gender: Male --- Female ---
Age: .....
Position: .....
Highest Degree Earned: .....
With kind regards,

What is the impact of each of the following factors on the relationship between digital technology and the quality and transparency of accounting?

No	Questions	Very High	High	Medium	Low	Very Low
1	Ease of use of the software					
2	Ease of software installation					
3	Ease of calculations					
4	Secure data registration					
5	High speed in calculations					
6	High speed in identifying discrepancies					
7	High speed in error reporting					
8	High speed in data analysis					
9	Timely identification of quantitative conflicts					
10	Timely identification of qualitative conflicts					
11	Timely identification of management conflicts					
12	Timely identification of developmental conflicts					
13	Timely reporting of challenges					
14	Periodic reporting of challenges					
15	Periodic analysis					
16	Simple language reporting					