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The Impact of Blockchain on the Quality of Accounting Information: An Iraqi Case Study

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Abstract: This paper aims to investigate the impact of blockchain on the quality of the information in listed and non-listed companies in Iraq; the temporal scope of this study is 2022. The statistical population of this research is divided into two parts: one part is related to the level of familiarity with blockchain technology of accountants, independent auditors, managers, etc., and the other part is related to the effect of blockchain technology on the quality of accounting information. The sample size is determined based on Cochran's formula, among which 1528 respondents were selected as a sample size. The results of the hypothesis testing showed that in both listed and non-listed companies, familiarity with blockchain technology had increased the quality of information. In this way, blockchain technology has positively and significantly impacted the quality of accounting information. This means that the impact of IT (Blockchain) on the quality of accounting information is the same for Iraqi listed and non-listed companies. Since the current research has been investigated in an emerging market such as Iraq, it can bring helpful information to readers in this field.

Keywords: blockchain; quality of accounting information; emerging market; information technology; security

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1. Introduction

IT programs specifically affect the operations of organizations. Organizations must understand the role of IT in various dimensions, including organizational processes (Nissenbaum 1997). Accounting information systems are supported by the same IT programs required to manage current business situations. The quality of accounting information depends on the integrity of the accounting information system related to business areas. Integrated business programs, such as IT programs, help create added business value (Sačer 2013). As a result, the reported information will be integrated, reliable, timely, and accurate. Collecting accounting data using IT often reduces the cost of producing accounting information. Furthermore, it increases the reliability of accounting information, saving time and expenses (Elsharif 2019).

Another line in the literature proposes that IT applications in business units can determine the quality of accounting information systems used for accounting purposes. Additionally, the accounting information system can transform the vital sources of business data and turn them into valuable information from which decisions can be made and legal obligations can be fulfilled (Qatawneh 2021). IT-based accounting information is necessary to provide information about the performance and processes of a business entity when it is helpful to current and potential investors and regulators. Blockchain is one of the main branches of IT that represents IT; therefore, this paper investigates and evaluates the impact of blockchain on the quality of information for listed and non-listed companies in Iraq. This research focuses on the effects of blockchain, i.e., hardware, software, and networks, on the accounting information system's quality features that meet the requirements of the

existing accounting frameworks. In addition, this research seeks to understand the impact of blockchain on the ability of the accounting information system to recognize valuable information and its effect on the internal control system, which can be used to improve decision-making processes. This study explains the impact of blockchain on the qualitative characteristics, fundamental qualities, relevance, and honest representation of business data in the accounting information system to increase its financial reporting quality consistent with accounting regulatory frameworks.

To be more precise, from the point of view of Fatima et al. (2021), four critical success factors for the accounting information system improve organizational performance. These factors include information, service, data, and system quality, which are vital in improving performance. In general, the quality of information relies on a computer-based system in companies designed to collect, store, and process data relating to accounting and financial data based on the accounting information system used in Iraqi listed and non-listed companies. It helps businesses to make good decisions. The main application of the accounting information system is in the development of a traceable IT solution for Iraqi companies. The critical point of the effect of using the accounting information system in Iraqi companies is to measure the performance of financial and nonfinancial data. Yli-Huumo et al. (2016) confirmed the relationship between these two variables by describing important information about the impact of blockchain on information quality. Therefore, the current research suggests that the quality of information should be flexible according to the technology and environment of Iraq. Blockchain is among the most prominent technologies after the internet. This technology is used dominantly in specific areas such as information processing, transmitting, storing, and security, which in turn has the potential to propose the development of a new environment to handle accounting information (Dai and Vasarhelyi 2017; Kokina et al. 2017).

The use of blockchain technology will likely structure an information system for company and market-level communities (Ito et al. 2017). The incremental enjoinment of organizations and individuals to a blockchain network forms an extensive community of various stakeholders, including investors, companies, tax authorities, auditors, and policymakers, all of whom benefit from an environment specified with effective and efficient information flow. Furthermore, to improve the security of information transmission and sharing, the enlargement of a blockchain system may enhance the security of the information flow in the network. An extensive community limits an entity's control over a majority of the network to manipulate the system's contents (Liu et al. 2019). Such a framework helps Iraqi companies effectively form the information environment structure for companies to make decisions flexibly so that they are always ready to adapt to new changes by using the information flow. Supportively, Albashabsheh et al. (2018) have shown that the accounting information system has reduced costs in Jordanian banks, meaning that IT applications improve the quality of financial reports and reduce the costs of information provision. In other words, the accounting information system has a qualitative feature that helps companies to maintain the internal control system. Taken together, the provision of high-quality information is among the most critical needs of financial market efficiency, particularly in emerging markets similar to Iraq, which is suffering from weak corporate governance mechanisms. Since prior studies argue that the application of IT may increase information quality, in general terms, this research aims to answer the research question of whether or not blockchain technology applications can improve the quality of financial reporting. Answering such an important question, especially in Iraq's financial market, is likely to provide vital practical implications for CEOs, investors, regulatory bodies, and auditors to improve the market efficiency as a general objective, as well as improve the provision of firm-level data as a specified criterion of ameliorated performance.

In addition, as productivity is considered one of the main criteria for evaluating effective management in wealth creation, assessing how profit is obtained or how efficiency and productivity are increased are a series of critical questions that can be answered by applying advanced IT elements. In other words, the effective and efficient use of available

resources through the application of advanced IT in companies, wealth creation is plausible. Therefore, we considered it necessary to examine the impact of IT development through blockchain technology on the quality of company information in Iraq.

In other words, this paper is necessary to understand the role of accounting information systems in Iraqi companies. Since this is believed to be a novel attempt to assess the impact of IT, especially hardware, software, and networks, on the effectiveness of the security of accounting information systems on the quality of accounting information in Iraq, it may enable the IT departments of organizations to have effective communication with other departments through effective system interaction. Thus, practically, this investigation's outcome may, for the first time, improve the informational environment related to blockchain technology for Iraqi companies. Several studies have been conducted to analyze the effects of IT in business units around the world, especially in the Middle East region. Studies on implementing information systems, especially accounting information systems, have been carried out in Iraq, but they have not specified the impact of blockchain technology on the information environment. Iraq has several competitive business units operating in different countries. They must be competitive in nature, and the role and analysis of IT to influence efficiency and improve the performance of business units has led to rationalization and innovation (Qatawneh 2021). Since the role of IT in organizations is increasing, this research shows the need, as identified in the literature review, to understand the role of quality, the application of blockchain, and the quality of the information in Iraqi companies, to gain productivity and efficiency.

The rest of the paper is organized as follows. In the following, theoretical foundations, methodology, data analysis, and finally, discussion and conclusions are presented.

2. Theoretical Principles and Hypothesis Development

International Financial Reporting Standards (IFRS) define high-quality information as equitable, relevant, understandable, practical, clear, and transparent. The provided financial information must consistently measure an entity's monetary situation, financial condition, revenue, and variations in its value, which may result in information reliability (Aifuwa and Embele 2019). Customers and other stakeholders are among the bodies that may use reliable and excellent financial information in their decisions and choices (Oji and Ofoegbu 2017). However, the deficit in corporate governance may undermine the quality of prepared financial information. Hope et al. (2013) argued that ownership dispersion may intensify the agency problem, requiring other governance mechanisms to provide higher-quality accounting information. In addition, responding to other stakeholders, such as tax collectors and shareholders, may encourage managers to prepare high-quality reports (Ball and Shivakumar 2005; Burgstahler et al. 2006).

Several characteristics, such as verifiability, comparability, timeliness, and understandability, are the most important qualitative characteristics of financial reports. These characteristics stress the provision of transparent and reliable data for their users rather than misleading information (Gajevszky 2015). For instance, the usefulness and materiality of financial information are two underlying features of relevant information since useful reports benefit decision makers (Cheung et al. 2010), and it refers to an entity's fair value (Beest et al. 2009). Other qualitative features include the reliability of financial reports that are obtainable by verifiability, faithfulness, and the neutrality of the prepared information (Cheung et al. 2010).

Furthermore, accounting bodies explain comparability as another quality dimension, enabling data users to compare financial reports, mainly the financial position, condition, and cash flow of a given company with that of its counterparts (Cheung et al. 2010). For instance, two companies competing in the same industry might be more comparable due to sharing similar market conditions, such as economic, GAAP, and industry-operating rules (De Franco et al. 2011). The comparability may assist managers in transferring the knowledge of their competitors into their company (Beatty et al. 2013) through reviewing, analyzing, note-taking, and learning from the financial statements of competitors (Durnev

and Mangen 2009). Additionally, comparability is proposed to preclude the additional cost of recording and analyzing information, enhancing the quantity and quality of information (Chen et al. 2018; De Franco et al. 2011). Chen and Gong (2019) showed that comparability between different fiscal years in a given firm correlates to a higher quality in financial reporting, explaining the managerial forecast with accuracy and precision. In addition, timely financial reports might be counted as high-quality information (Nelson and Shukeri 2011) since it is willing to mitigate the information asymmetry. The value of timelier information comes from its capability to significantly influence the decision-maker's preference of choice (Financial Accounting Standards Board 2010). Feltham (1972) argued that a decision-maker's selection and possible payoffs will likely be determined by timely information. Givoly and Palmon (1982) and Kross and Schroeder (1984) suggested that companies providing delayed financial reports are less likely to experience abnormal returns. Therefore, the timeliness of financial reports is considered critical in determining the quality of accounting information.

IT and extensive IT systems are common topics in financial fields such as accounting (Shanker 2020). The biggest impact of IT on accounting is the ability of companies to develop and use computer systems to track and record financial transactions. Using multiple technologies leads to faster and more accurate results, so IT increases the speed of obtaining, processing, and analyzing information. Meanwhile, blockchain is one of the subbranches of new digital technologies (Carson et al. 2018; Ruzza et al. 2020), attracting the attention of many researchers and is of great interest in various fields today. Therefore, research on blockchain and its advantages and disadvantages has increased widely in recent years. There is a growing interest in studying the outcomes and experiences of business units following the implementation of blockchain-related technologies (Casino et al. 2019; Schmitz and Leoni 2019).

The use of blockchain in accounting and auditing can reduce accounting and auditing costs (Xu et al. 2019); however, more research is still needed in this field. For example, Kokina et al. (2017) state that research on the ownership of accounting data and transparency in decentralization brought about by blockchain needs further investigation, as definitions of blockchain and its applications are still unclear. It is unclear in the field of accounting (Kokina et al. 2017; Schmitz and Leoni 2019; Bonsón and Bednárová 2019). Many studies have investigated the effects of blockchain on the accounting and auditing profession (Coyne and McMickle 2017; Demirkan et al. 2020; O'Leary 2017; Marrone and Hazelton 2019). Arnaboldi et al. (2017) suggested that the revolution of new information technologies will significantly impact organizations, individuals, and professions, including accounting.

2.1. Explaining the Relationship between Blockchain and the Quality of Accounting Information

Technological advancements over the past few decades have greatly increased the competitive nature of the business world. Companies may use software, hardware, and the internet to transform their businesses from being local and traditional organizations to competing in global markets. Many of these companies have responded to these changes by automating their business processes, gathering industry-related information, and using it to their advantage. Computers have changed the nature of accounting and turned it into a fast-paced and dynamic profession. The change in accounting technology began with simple spreadsheet programs that upgraded companies from manually calculated spreadsheets. Because of these automated programs, accountants have more time to interpret data, provide sound financial advice, suggest smarter business decisions, and contribute more to their client's businesses. Accountants are now expected to recommend best practices to management and suggest ways to reduce costs while improving profits. Information is described as a form of data that is processed and specifically organized and structured in data applications, which enhances the quality and reliability of data in listed and non-listed companies, resulting in increased comprehensibility and the guarantee of reducing uncertainty (Surbhi 2018).

IT provides better and faster access to information. In other words, technology has changed the way of doing things and has made what was once a paper-based platform now an electronic platform, through which we can refer to technological developments in the processes of using blockchain, the internet of objects, cloud accounting, and big data in the form of automation and accounting. In this way, blockchain can play a role wherever there is hierarchical information and data and where trust and security are considered. Blockchain can create integration between the accounting information systems of other parties and the contracts with listed and non-listed companies. Since the process of receiving, recording, and systematic processing of information in the blockchain began, human errors that previously existed in traditional systems have been minimized, increasing the quality of the information provided. In this regard, Garanina et al. (2022) state that by using the blockchain, the owners of the business unit can benefit from more accurate information in the financial field. One of the characteristics of information quality is accuracy; therefore, increasing the accuracy of financial information will increase the quality of information.

Dai and Vasarhelyi (2017) stated that blockchain protects data integrity, facilitates the instant sharing of necessary information, and the programmed and automatic control of processes can facilitate the development of a new envy ecosystem. Like any innovation, blockchain can be interpreted as an opportunity. According to Hernandez (2017), blockchain can make accounting information more reliable and can save time by providing a better alternative to current accounting and auditing systems. Since the primary purpose of accounting has always been to create and present information to internal and external decision makers (Janvrin and Wang (2019)), accountants tend to focus on the accuracy and value of information collection. Blockchain is a technology that helps accountants collect and prepare valuable and effective information since the basis of blockchain work is the accurate preparation and reporting of information at the right and appropriate time. Therefore, it can be said that blockchain can improve the quality of companies' accounting information.

Companies applying blockchain with optimal contracts are likely to enhance compliance risk management and effectiveness. For instance, optimal contracts may optimize companies' functions for following different laws and regulations (Pilkington 2016). In this sense, pre-identifier schemes might be implemented in blockchain to recognize unsure transactions in a timelier manner. Such pre-identifiers may also be applied to monitor a company's financial well-being and assist decision makers in developing fresh and effective internal controls (Psaila 2017). In addition, the blockchain may suggest new working spaces to auditors, including reviewing specific transactions, identifying the presence of digital assets, and assessing the consistency between information in the physical world and what exists on a blockchain. These recommended working spaces may create some challenges for auditors, especially when centralized administrations are lacking on the blockchain. However, auditors might be required to improve their IT expertise to develop novel procedures to cover the recognition of ownership. In addition, the application of blockchain may significantly alter the auditing process. Since recorded transactions are stored completely on a blockchain, there is less likelihood of requesting and waiting on data and documents from auditors. Blockchain applications may free up auditors' resources which were previously dedicated to the collection, verification, and presentation of evidence.

Despite the abovementioned merits of the application of blockchain, auditors are required to assess client motivation, and the quality of blockchain's code, protocol, and power dedication among peers can cover the potential deficits. Agrifoglio and de Gennaro (2022) first explore the topic of blockchain adoption in the accounting field by emphasizing the relevance of this fresh technology for accounting professionals and companies and the related limitations of its adoption. Secondly, they provide an overview of the process of blockchain technology adoption by addressing the questions of "how" and "why" accounting professionals and companies might apply blockchain. Murodovich and Ziyadullaevna (2022) believe that there is a need for the formation of skills in digital technologies and the

introduction of accounting digitization by accountants and auditors. Therefore, by reducing the workload of auditors, which in turn provides them more time to implement additional analysis and the improvement in the flow of information inside and outside of the companies through sharing information in a secure environment, blockchain applications can ameliorate financial reporting quality both at the firm-level and market-level. Supportively, Hongdan et al. (2023) argue that agency theory and stakeholder theory are applicable to advance how using blockchain may mitigate information asymmetry and improve stakeholder collaborations. Kitsantas and Chytis (2022) argue that blockchain technology can alter today's enterprise resource planning system architecture and rectify these centralized systems' limitations. They also recommend a private, permission-based blockchain through which only authorized entities can cooperate in triple-entry accounting. Using optimized contracts in a secure environment might be plausible for providing high-quality information. Wang (2022) shows that blockchain technology is beneficial to ensure audit information security and can improve audit quality by 20%. Kabir et al. (2022) demonstrated that internal audit quality and integrity substantially influence internal audit quality. The potential application of blockchain is identified to rectify the association between integrity and internal audit quality. Daemigah (2020a) documents in a meta-analysis that auditors' characteristics are likely to determine the quality of financial reports. Bocean and Vărzaru (2022) show that security and trust are the ethical requirements of digital technologies that influence the perception of financial and managerial accounting. Among the quality requirements, the most critical influence on the perception of accountants is reliability. The research conducted in this field can also confirm this claim, which now follows.

Thoa and Nhi (2022) investigated the impact of improving the quality of accounting information on financial independence using a questionnaire that included 164 Vietnamese public organizations with different levels of financial independence. The obtained results indicate that improving the quality of accounting information leads to an increase in the financial independence of government organizations.

Abdelraheem et al. (2021) assessed the effect of using IT on the quality of accounting information by studying the dimensions of IT (collecting, processing, storing, and sending data and information) with a field study at the Nile Bank in Sudan. The researchers followed the descriptive analytical approach to conducting the field study. Researchers distributed 120 questionnaires and collected 104 questionnaires. This study concluded that the dimensions of IT (collection, processing, storage, and transmission of data and information) affect accounting information quality (relevance, reliability, comprehensibility, consistency, and comparability).

Abdul-Ghani (2019) found a solution to the problem presented in determining the effect of IT in accounting maintenance on the qualitative characteristics of accounting information and examined the effect of IT on the qualitative characteristics of accounting information. In this context, and to achieve these goals through inferential statistics, information was collected using a questionnaire distributed among a sample of academicians and accounting professionals in Aum al-Bawaghi state. The hypotheses were examined using the binomial test, which showed the direction of positive and negative signs regarding the answers of the sample members. One of the most important results obtained was the inevitability of the dependence of current institutions on IT, which is the determining factor in distinguishing between the results of accounting information and honest representation. It is also considered one of the most critical factors that can help an institution obtain high-quality accounting information.

Khorashadi et al. (2017) investigated the impact of IT on the quality of accounting information in 2013, which examined 425 CEOs of companies listed on the Tehran Stock Exchange using Cochran's formula and a simple random sampling method, and 84 managers of such companies were considered as the sample size. Data collection methods were based on an IT questionnaire; some standardized IT impact questions, and questions based on existing components. After distributing and collecting the questionnaires, analyzing the data, and testing the hypothesis using Smart PLS2 structural equation modeling, the

software scaling of the model and structure was carried out in two parts. In the first part of the questionnaire, technical features, including reliability, validity, convergence, and validity of the PLS variable, were confirmed. In the second part, significant coefficients were not used to check the research hypotheses. The results showed that IT and its dimensions (timeliness, relevance, accuracy, adequacy, and actual conversion rate) affect the quality of accounting information of companies admitted to the Tehran Stock Exchange.

Wisna (2013) assessed the extent of the impact of IT on the quality of an accounting information system (honest representation, appropriate timing, flexibility, and development) and determined the effect of the use of IT on the quality of accounting information (appropriateness, accuracy, completeness) of a study community consisting of universities, institutions. With significant changes in the quality of financial and accounting information and the use of IT leading to more timely financial disclosure, IT also greatly affects the quality characteristics of accounting information.

Therefore, according to the discussion, the first hypothesis is as follows:

H1. *The application of blockchain IT has a positive impact on the quality of accounting information in listed and non-listed companies.*

2.2. Explaining the Relationship between Blockchain and the Quality of Accounting Information in a Stock Market Is Stronger Than the Non-Listed Market

The increased volume of capital market transactions over the past years has led to software development in this market. Every new software or tool also has an instruction that before its approval and approval, it must obtain the security approval of the stock market information security monitoring center. In line with the development of this market, software changes and financial tools in the financial markets have resulted in ease of access for capital market activists and audiences. Before the penetration of new information technologies, the big problem for the capital market was that different people entered the stock market with different capitals and participated in large economic activities. What should such people do when they sell their shares and capital at the right price? This issue has been resolved in the shadow of the stock exchange in such a way that the stock exchange has designed a mechanism so that any person with any number of shares, who decides to sell his shares every day, can be informed of the price of his shares, or even if he has not decided to sell, he may know the daily price of his shares. On the other hand, the stock market index represents the results of stock market shares (Lucas et al. 2009). But in non-listed companies, there is no mechanism and supervision. Therefore, this is another disadvantage of the non-listed market. The infrastructures and systems of all companies under the supervision of the Securities and Exchange Organization, including IT units, have a comprehensive security check and periodic auditing at specific time intervals based on the information security requirements document and the information security monitoring center of the listed companies in the capital market. The capital market information security monitoring center's general mission is to improve the security level of capital market IT systems and infrastructures, identify and fix vulnerable issues, and manage cyber security risks to protect investors' interests against cyberspace security threats (Demirkan et al. 2020). In these evaluations, each control and item is given a weight and score; every year, companies must improve in their fields and achieve a higher score. Currently, the security assessment indicates a company's acceptability status. Since there is no such center for monitoring information security in non-listed companies, we expect that the spread of IT will have a greater impact on the information security of listed companies than non-listed ones. Therefore, according to the discussion, the second hypothesis is as follows:

H2. *The impact of the application of blockchain IT on the quality of accounting information is stronger in listed companies than in non-listed companies.*

3. Research Methodology

The survey method is applied to investigate the hypotheses. The gathered data were analyzed using PLS3 and SPSS statistical software. By applying and analyzing the collected information, the validity of the test research hypotheses and findings might be broadened to the whole statistical population. The scientific method depends on the research's objective, nature, and main subject. Regarding implementation logic, this study was in the category of inductive analysis. The researcher must collect data through experimental observations and then specify their relationships. In the next step, by using the data analysis techniques available in econometrics, claims are confirmed or rejected and a conclusion is reached. In this kind of research, the researcher talks about what is, not what should be, and uses descriptive theories for this purpose. In accounting, most of the conducted studies are through evidence-behavioral studies. In terms of the time dimension, the present research is included in the series of temporal studies since its data were extracted through a questionnaire and in a specific and short period. In terms of objective, it is also in the category of descriptive-survey research. The questionnaires used in the present research were standard questionnaires. The questionnaire questions were also based on the research topic: the extent of IT on the quality of accounting information in Iraq. These questions were prepared on a 5-point scale (Likert scale). PLS statistical software was used to analyze the collected data. To measure the variables for the quality of information from the standard questionnaire on information quality, which has five items and one component, the rest of the questions were made by the researcher with a five-point Likert scale (completely disagree to completely agree), where each item had a value between 1 to 5. The content measures the quality of the information with questions such as: (The information systems of this office are designed in such a way that I can obtain correct and valid information related to my work). Moreover, the NAP questionnaires used in this research were standard questionnaires.

3.1. Data Collection Methods

The information used in this research is divided into two categories. The first is information related to theoretical foundations and research literature provided by studying domestic and foreign sources, and the second is information collected through a questionnaire. The research implementation year was 2022, and in two parts; the first division is related to the level of familiarity of accountants, independent auditors, managers, etc., based on Mai (2021) and Abu Afifa et al. (2022). The second part related to the effect of blockchain technology on the quality of accounting information in Iraqi listed and non-listed companies. Information quality was based on Al-Dmour et al. (2018), Kieso et al. (2020), and Alrabei and Ababnehi (2021), and the blockchain questionnaire was based on information quality from Abu Afifa et al. (2022).

In this study, the abovementioned questionnaires were employed due to the familiarity with blockchain technology (Mai (2021) and Abu Afifa et al. (2022)). However, it is worth mentioning that to control the responses received for the level of familiarity with blockchain, extensive analysis was conducted; for example, four groups of respondents (auditors, accountants, managers, etc.) will be compared in terms of the level of familiarity with blockchain. To ensure the familiarity of participants, control mechanisms were used. In this way, the questionnaire was prepared and tested to measure the familiarity of the studied community groups with blockchain technology, including auditors, accountants, managers, etc., to assess its effects, advantages, and disadvantages in the accounting and auditing profession to obtain the necessary basis for testing the main hypotheses of this research. In this way, we measured the familiarity of accountants, auditors, managers, etc., of listed and non-listed companies. The scope of this questionnaire was measured from very high to very low on the Likert spectrum scale. Then, our analysis was based on the level of familiarity of our four sample groups to find out which group was more familiar with blockchain and its effects on accounting information quality. Then we analyzed the results of the main research questionnaire.

3.2. Population under Study

The statistical population of this research included the level of familiarity of individual participants, consisting of accountants, auditors, managers, and other practitioners, with the effect of blockchain technology on the quality of accounting information in all Iraqi listed and famous non-listed companies. To obtain the opinion of respondents, the questionnaires were initially sent to individual accountants, financial managers, auditors, and those working in financial-related occupations inside the companies. The questionnaires were typically sent to all of the listed companies and the famous non-listed companies in two forms; a paper version, which was mostly sent to companies whose headquarters are located in the capital city of Baghdad, and an electronic version, which was sent to companies whose headquarters are located in other cities of Iraq. Notably, the electronic version was sent to the respondents of other cities with limitations for physical reference. Once the completed questionnaires were collected, they were divided into two categories—listed and non-listed companies. The number of considered questionnaires received from listed companies was 686 (45%), and from non-listed companies, 842 (55%). In the next stage, the data were entered into Excel spreadsheets in preparation for transmission to the statistical software. Finally, the selected sample was submitted for statistical analysis based on the types of companies. For this purpose, the validity of the sample size was calculated through Cochran's formula as follows:

The main formula for calculating Cochran's sample size is as follows:

$$n = \frac{\frac{Z^2 pq}{d^2}}{1 + \frac{1}{N}\left(\frac{Z^2 pq}{d^2} - 1\right)}$$

where n is the statistical sample size, N is the size of the statistical population, d is the permissible error (usually considered equal to 0.05), Z is the value of the normal variable with a confidence level of α-1, p is the proportion of possessing the desired attribute (for example, male population), $q = 1 - p$ and is the proportion of not having the desired attribute (for example, female population). Usually, p and q are considered to be 0.5. In the two-domain test, the z value for the 95% confidence level is 1.96, and for the 99% confidence level, it is 2.58.

3.3. Research Variables

Dependent variable: the quality of accounting information, as measured by the standard accounting information quality questionnaire based on Al-Dmour et al. (2018), Abu Afifa et al. (2022), and Alrabei and Ababnehi (2021).

Independent variable: Blockchain is the independent variable of the research, which is measured by the standard questionnaire based on Al-Dmour et al. (2018) and Abu Afifa et al. (2022).

It is noticeable that the abovementioned questionnaires are employed since they were formerly used or developed in emerging markets, which may share similar characteristics with Iraq's financial market; therefore, these questionnaires might be the most fitting for the Iraq statistical population. Furthermore, such a claim is supported by the strong coefficients of Cochrane Alpha and the goodness of fit of the questionnaire.

4. Data Analysis

4.1. Descriptive Statistics

Table 1 shows the frequency of demographic data (the general part of the questionnaire). As shown in the table, more than half of the questionnaire respondents (more than 57 percent) were men. It can be said that most people with experience of 6 to 10 years had completed the answer sheet of this paper. Most people (more than 40 percent) had a bachelor's degree. Additionally, over 50% of participants had obtained accounting and auditing degrees, most of whom are accountants.

Table 1. The descriptive statistics of the respondents.

	No.	Percentage		No.	Percentage
Gender			**Work Experience**		
Male	873	57.13	5 years and less	470	30.76
Female	655	42.87	6–10 years	524	34.29
Age			11–15 years	355	23.23
20–25 years	586	18.72	More than 15 years	179	11.71
26–30 years	236	15.45	**Education**		
31–35 years	616	40.31	Less than a bachelor's degree	397	25.98
35 years and above	390	25.52	Bachelor's degree	626	40.97
Field of study			Masters	343	22.45
Accounting and auditing	800	52.36	Ph.D	162	10.60
Economy	249	16.30	**Job title**		
Financial management	267	17.47	Manager	363	23.76
Other	212	13.87	Accountants	572	37.43
Type of company			Auditor	353	23.10
Listed	686	44.90	other	240	15.71
Non-listed	842	55.10	Total	1528	100

In this research, to investigate the impact of blockchain systems on the quality of accounting information in Iraqi listed and non-listed companies, a questionnaire was completed by 1528 people, and more than 55% of these companies were listed companies. The designed questionnaire consisted of 96 questions in two main parts: familiarity with blockchain and quality of information. Each of these sections was formed through several subsections. The options provided for the first seven questions regarding the level of familiarity with blockchain technology were different from the rest of the sections. For other sections, the options in front of each question included completely agree, agree, have no opinion, disagree, and completely disagree, coded with numbers 1 to 5, respectively. Next, in the first part, the descriptive statistics for different questionnaire parts are presented separately for listed and non-listed companies.

4.2. Inferential Statistics

Cronbach's alpha is a measure to assess the internal consistency and the reliability of the employed questionnaire. The alpha coefficient is always between 0 and 1, which equals 0.918 for this paper, implying that the questionnaire was appropriate. In addition, to assess the validity of the construct, the mean-variance measure was extracted, for which the Fornell and Larcker criterion was applied. The AVE measure in Table 2 states that the mean-variance captured for each model aspect has a value greater than 0.5; therefore, the convergent validity of the questionnaire was accepted. According to Table 2, the AVE value for the variables of both models was higher than 0.5, so it can be said that the convergence validity of the measurement models was used from the sharing index.

Table 2. The reliability and validity findings of the research.

Cronbach's Alpha	Composite Reliability Coefficient	AVE
0.918	0.873	0.699

For the goodness of fit criteria of the questionnaire, the null hypothesis indicates no difference between the fitted model and the sample covariance matrix. The critical point is

that this index is affected by the sample size: when the sample size is large, it will show a small difference, which indicates a good fit. To adjust the index, for instance, chi-square is used on the degree of freedom along with other goodness of fit indices, which include 1—the goodness of fit index (GFI), 2—the adjusted goodness of fit index (AGFI), 3—the comparative fit index (CFI), 4—the Tucker–Lewis index (TLI), 5—the root mean square of standardized errors (SRMR), and 6–the root mean square error of approximation (RMSEA), where a value less than 0.08 indicates reasonable errors to approximate in society. The goodness of fit indices of measurement models are reported separately in Table 3. It can be concluded that the model fitting is suitable for each data group obtained, and, therefore, its results are reliable.

Table 3. The goodness of fit criteria of the questionnaire.

Index	Sign	Calculation	Acceptable	Ideal
χ^2 significance	χ^2	<0.001	$0.05 < p \leq 1.00$	$0.01 < p \leq 0.05$
Optimized chi-square	χ^2/df	1.345	$0 < \chi^2/df \leq 5$	$0 \leq \chi^2/df \leq 3$
good of fit	GFI	0.975	$0.80 \leq GFI < 0.95$	$0.95 \leq GFI \leq 1.00$
Adjusted goodness of fit	AGFI	0.903	$0.80 \leq GFI < 0.95$	$0.95 \leq GFI \leq 1.00$
Residual root mean square	RMR	0.042	$0 < RMR \leq 0.10$	$0 \leq RMR \leq 0.05$
Comparative fit index	CFI	0.974	$0.90 \leq CFI < 0.97$	$0.97 \leq CFI \leq 1.00$
Root mean square of the estimation error	RMSEA	0.028	$0.05 < RMSEA \leq 0.08$	$0 \leq RMSEA \leq 0.05$

As was stated earlier, in order to investigate the impact of blockchain expansion on the quality of accounting information in Iraqi listed and non-listed companies, 88 questions, including demographic information, the level of familiarity with blockchain technology, and the quality of information, were evaluated. Table 4 shows the named components and the number of questions that make up each. In addition, Cronbach's alpha of each part of the questionnaire was calculated. The questionnaire had a suitable internal structure because Cronbach's alpha was calculated between 0.785 and 0.989.

Table 4. The components, number of questions, Cronbach's alpha, and factor analysis results.

Components	Question	Cronbach's Alpha	Factor Analysis
1. Familiarity with blockchain technology (total questions)	41	0.785	0.792–0.887
A. Familiarity with blockchain technology, part 1	7	0.836	0.792–0.887
B. Familiarity with blockchain technology, part 2	9	0.883	0.879–0.997
C. Blockchain applications for accounting	20	0.915	0.772–0.934
C1. Hope (expectation of) to perform	4	0.921	0.883–0.957
C2. Hope to try	4	0.842	0.705–0.898
C3. Job communication	4	0.895	0.781–0.905
C4. Confidence	5	0.989	0.879–0.998
C5. Compatibility	3	0.859	0.772–0.914
D. Blockchain applications for auditing	5	0.902	0.883–0.957
2. Quality of information (total questions)	39	0.889	0.762–0.911
Relevance	7	0.941	0.883–0.928
Faithful representation	5	0.902	0.835–0.917
Comparability	6	0.899	0.805–0.815
Timeliness	1	0.974	0.872–0.989
Verifiability	3	0.912	0.874–0.943
Understandability	7	0.879	0.809–0.907
Blockchain on the quality of information	10	0.908	0.887–0.946

In order to create hidden variables, the component of each part was first obtained through averaging using the factor analysis method. Then, the two main components, familiarity with blockchain technology and the quality of information, were obtained similarly. In Table 5, the descriptive statistics of the hidden variables of the data of the listed companies are presented. Among the application variables of blockchain for accounting, the hope (expectation of) performance has the lowest average; therefore, this variable is expected to have the greatest impact on the BAA variable. The blockchain variable has the lowest average on information quality among the information quality variables. Therefore, this variable is expected to have the greatest impact on the BAQ variable

Table 5. The descriptive statistics of hidden variables for stock exchange company data.

Components	Latin Equivalent	Observations	Mean	Standard Deviation	Minimum	Maximum
1. Familiarity with blockchain technology (total questions)	FCT	842	2.695	0.326	1.544	3.635
A. Familiarity with blockchain technology, part 1	FAT	842	2.434	0.399	1.286	3.714
B. familiarity with blockchain technology, part 2	FBT	842	2.26	0.522	1.000	4.444
C. Blockchain applications for accounting	BAA	842	2.862	0.549	1.150	4.550
C1. Hope (expectation of) to perform	HPA	842	2.475	0.950	1.000	5.000
C2. Hope to try	HTA	842	2.611	0.926	1.000	5.000
C3. Job communication	JCA	842	2.819	0.781	1.000	5.000
C4. Confidence	TCA	842	3.148	0.684	1.000	5.000
C5. Compatibility	HAA	842	3.29	0.828	1.000	5.000
D. Blockchain applications for auditing	BSA	842	3.221	0.733	1.000	5.000
2. Quality of information (total questions)	BAQ	842	3.188	0.573	1.224	4.697
Relevance	BRQ	842	3.181	0.739	1.000	5.000
Faithful representation	BFQ	842	3.224	0.861	1.000	5.000
Comparability	BCQ	842	3.215	0.793	1.000	5.000
Timeliness	BNQ	842	3.178	1.074	1.000	5.000
Verifiability	BOQ	842	3.227	0.811	1.000	5.000
Understandability	BSQ	842	3.203	0.645	1.000	5.000
Blockchain on the quality of information	BBQ	842	3.086	0.823	1.000	5.000

Table 6 shows the descriptive statistics for non-listed company variables. Among the application variables of blockchain for accounting, the hope (expectation of) performance has the lowest average; therefore, this variable is expected to have the greatest impact on the BAA variable. The blockchain variable has the lowest average on information quality among the information quality variables. Therefore, this variable is expected to have the greatest impact on the BAQ variable.

Tables 7 and 8 display the correlation between the hidden components of the research, including the main variables of familiarity with blockchain technology and the quality of information, obtained for listed and non-listed companies, respectively. For both groups of listed and non-listed companies, the five components of blockchain applications for accounting, include hope (expectation) for performance, hope for effort, job relationship, trust (assurance), and consistency of positive effect at the 99% level. They have significant confidence. Among these five components, the variables of hope for performance and hope for effort have the highest correlation with the BAA variable for listed companies. HAA has

the lowest correlation with the variable of blockchain applications for accounting. For non-listed companies, the effort variable has the highest correlation with the BAA variable, and the adaptability variable (HAA) has the lowest correlation with the blockchain application variable for accounting.

Table 6. The descriptive statistics of the data for non-listed companies.

Components	Latin Equivalent	Observations	Mean	Standard Deviation	Minimum	Maximum
1. Familiarity with blockchain technology (total questions)	FCT	686	2.708	0.319	1.544	3.634
A. Familiarity with blockchain technology, part 1	FAT	686	2.434	0.392	1.285	3.571
B. familiarity with blockchain technology, part 2	FBT	686	2.259	0.499	1.000	4.444
C. Blockchain applications for accounting	BAA	686	2.862	0.563	1.150	4.550
C1. Hope (expectation of) to perform	HPA	686	2.489	0.970	1.000	5.000
C2. Hope to try	HTA	686	2.576	0.956	1.000	5.000
C3. Job communication	JCA	686	2.775	0.797	1.000	5.000
C4. Confidence	TCA	686	3.164	0.668	1.000	5.000
C5. Compatibility	HAA	686	3.304	0.819	1.000	5.000
D. Blockchain applications for auditing	BSA	686	3.276	0.722	1.000	5.000
2. Quality of information (total questions)	BAQ	686	3.225	0.578	1.224	4.697
Relevance	BRQ	686	3.203	0.747	1.000	5.000
Faithful representation	BFQ	686	3.282	0.868	1.000	5.000
Comparability	BCQ	686	3.278	0.801	1.000	5.000
Timeliness	BNQ	686	3.212	1.078	1.000	5.000
Verifiability	BOQ	686	3.269	0.814	1.000	5.000
Understandability	BSQ	686	3.244	0.639	1.000	5.000
Blockchain on the quality of information	BBQ	686	3.090	0.856	1.000	5.000

The level of familiarity with blockchain technology consists of four subsections: part (a), part (b), blockchain applications for accounting, and blockchain applications for auditing. For both listed and non-listed companies, all four components were estimated to be positive and significant at the 99% confidence level. Further, blockchain applications for accounting have the highest correlation, and part (a) of the questionnaire has the lowest correlation with the variable of familiarity with blockchain technology (FCT). Information quality (BAQ) is also formed through seven subindices. For both groups of listed and non-listed companies, these seven subindices have a positive and significant effect on the quality of information at the 99% confidence level. For listed and non-listed companies, comparability (BCQ) has the highest correlation, and the relevance variable (BRQ) has the lowest correlation with the BAQ variable.

For non-listed companies, the level of familiarity with blockchain technology has a positive effect on the quality of information at the 99% confidence level. The correlation coefficient between these two variables is equal to 0.11. On the other hand, the correlation between quality variables and information security has also been obtained at a 95% confidence level equal to 0.05.

Table 7. The correlation matrix of hidden research variables for listed companies.

	FAT	***FBT***	***HPA***	***HTA***	***JCA***	***TCA***	***HAA***	***BAA***	***BSA***	***FCT***	***BRQ***	***BFQ***	***BCQ***	***BNQ***	***BOQ***	***BSQ***	***BBQ***	***BAQ***
FAT	1.00																	
FBT	0.13 ***	1.00																
HPA	0.05	0.36 ***	1.00															
HTA	−0.01	0.31 ***	0.74 ***	1.00														
JCA	0.01	0.15 ***	0.50 ***	0.57 ***	1.00													
TCA	0.08	−0.05	0.08 **	0.09 ***	0.18 ***	1.00												
HAA	0.02	−0.01	0.07 **	0.01	0.06 **	0.46 ***	1.00											
BAA	0.04	0.26 ***	0.78 ***	0.78 ***	0.72 ***	0.50 ***	0.46 ***	1.00										
BSA	0.03	−0.06 *	0.06 *	−0.01	0.01	0.39 ***	0.59 ***	0.30 ***	1.00									
FCT	0.39 ***	0.52 ***	0.52 ***	0.44 ***	0.37 ***	0.43 ***	0.53 ***	0.70 ***	0.67 ***	1.00								
BRQ	0.06	−0.03	0.01	−0.03	0.06	0.14 ***	0.09 **	0.07 **	0.10 ***	0.09 ***	1.00							
BFQ	0.003	0.02	−0.06	−0.05 **	0.01	0.05	0.04	−0.01	0.02	0.02	0.09 ***	1.00						
BCQ	0.01	0.02	−0.04	−0.05	0.01	0.03	0.03	−0.01	0.01	0.01	0.10 ***	0.77 ***	1.00					
BNQ	−0.03	0.01	−0.04	−0.04	−0.02	0.04	0.06 *	−0.01	0.04	0.01	0.07 **	0.57 ***	0.64 ***	1.00				
BOQ	0.03	−0.01	−0.05	−0.04	−0.01	0.08	0.07 **	0.004	0.06 *	0.04	0.11 ***	0.63 ***	0.66 ***	0.62 ***	1.00			
BSQ	−0.04	−0.005	0.01	0.01	−0.02	0.09 ***	0.12 ***	0.06 *	0.13 ***	0.09 **	0.11 ***	0.44 ***	0.45 ***	0.43 ***	0.55 ***	1		
BBQ	−0.03	0.02	−0.05	−0.02	−0.05	−0.04	−0.04	−0.06 *	−0.05	−0.05	0.05	0.33 ***	0.36 ***	0.35 ***	0.32 ***	0.51 ***	1.00	
BAQ	**−0.001**	**0.01**	**−0.05**	**−0.05**	**−0.01**	**0.08**	**0.07**	**0.01**	**0.06 ***	**0.04 ***	**0.29 ***	**0.80 ***	**0.83 ***	**0.80 ***	**0.81 ***	**0.69 ***	**0.60 ***	**1.00**

Note: *, **, and *** indicate significance levels of 90%, 95%, and 99%, respectively.

Table 8. The correlation matrix of hidden research variables for non-listed companies.

	FAT	*FBT*	*HPA*	*HTA*	*JCA*	*TCA*	*HAA*	*BAA*	*BSA*	*FCT*	*BRQ*	*BFQ*	*BCQ*	*BNQ*	*BOQ*	*BSQ*	*BBQ*	*BAQ*
FAT	1.00																	
FBT	0.17 ***	1.00																
HPA	0.05	0.31 ***	1.00															
HTA	0.02	0.30 ***	0.78 ***	1.00														
JCA	−0.02	0.16 ***	0.58 ***	0.63 ***	1.00													
TCA	0.04	−0.06 *	0.08 **	0.09 **	0.10 **	1.00												
HAA	−0.01	−0.004	0.07 **	0.03	0.03	0.44 ***	1.00											
BAA	0.03	0.24 ***	0.81 ***	0.82 ***	0.73 ***	0.45 ***	0.44 ***	1.00										
BSA	−0.002	−0.06	0.06	0.002	−0.05	0.38 ***	0.61 ***	0.27 ***	1.00									
FCT	**0.38** ***	**0.52** ***	**0.53** ***	**0.49** ***	**0.35** ***	**0.40** ***	**0.53** ***	**0.70** ***	**0.66** ***	**1.00**								
BRQ	0.001	−0.05	−0.01	−0.03	−0.02	0.01	−0.02	−0.02	0.01	−0.02	1.00							
BFQ	−0.04	0.02	−0.07 **	−0.04	−0.05	−0.08 **	−0.09 **	−0.10 **	−0.11 ***	−0.11 ***	−0.02	1.00						
BCQ	−0.04	−0.005	−0.08 **	−0.06	−0.05	−0.09 **	−0.07 *	−0.10 ***	−0.10 ***	−0.12 ***	−0.01	0.79 ***	1.00					
BNQ	−0.07 **	0.01	−0.07 *	−0.06	−0.09 ***	−0.08 ***	−0.04	−0.10 **	−0.05	−0.09 **	−0.02	0.58 ***	0.69 ***	1.00				
BOQ	−0.01	−0.01	−0.08	−0.04	−0.08 **	−0.07 *	−0.06	−0.10 **	−0.05	−0.08 **	−0.01	0.62 ***	0.66 ***	0.64 ***	1.00			
BSQ	−0.10 **	0.01	−0.001	0.02	−0.06	−0.003	0.03	−0.002	0.04	−0.01	0.02	0.42 ***	0.43 ***	0.43 ***	0.56 ***	1.00		
BBQ	−0.06	0.02	−0.08 **	−0.04	−0.06 *	−0.06	−0.03	−0.08 **	−0.06	−0.08 **	0.06	0.41 ***	0.41 ***	0.40 ***	0.39 ***	0.56 ***	1.00	
BAQ	**−0.07** *	**0.003**	**−0.09** **	**−0.05**	**−0.09** **	**−0.08** **	**−0.06**	**−0.11** ***	**−0.07** **	**0.11** ***	**0.19** ***	**0.80** ***	**0.84** ***	**0.81** ***	**0.81** ***	**0.68** ***	**0.67** ***	**1.00**

Note 1: *, **, and *** indicate 90%, 95%, and 99% significance levels, respectively. Note 2: FCT is familiarity with blockchain technology (total questions); FAT is familiarity with blockchain technology, part 1; FBT is familiarity with blockchain technology, part 2; BAA is blockchain applications for accounting; HPA is hope (expectation of) to perform; HTA hopes to try; JCA is job communication; TCA is confidence; HAA is compatibility; BSA is blockchain applications for auditing; BAQ is quality of information (total questions); BRQ is relevance; BFQ is faithful representation; BCQ is comparability; BNQ is timeliness; BOQ is verifiability; BSQ is understandability; and BBQ is blockchain on the quality of information.

Next, the effect of explicit and implicit variables of the research was drawn for the data group of listed and non-listed companies. Figure 1 defines the creation of two main research variables, FCT and BAQ. Familiarity with blockchain technology itself is formed through four subsections. These four components have a positive and significant effect on the FCT variable. Meanwhile, the BAA variable itself is formed through five subindices, all of which positively and significantly affect the BAA variable. Meanwhile, the variable of information quality (BAQ) is also formed through six subindices, all of which have a positive and significant effect on the variable of BAQ. The three main variables of the research also positively affect each other for listed companies and at the 99% confidence level. In non-listed companies, according to Figure 2, similar results have been obtained from stock companies, with the difference being that the relationship between the quality of information is significant at the 95% level.

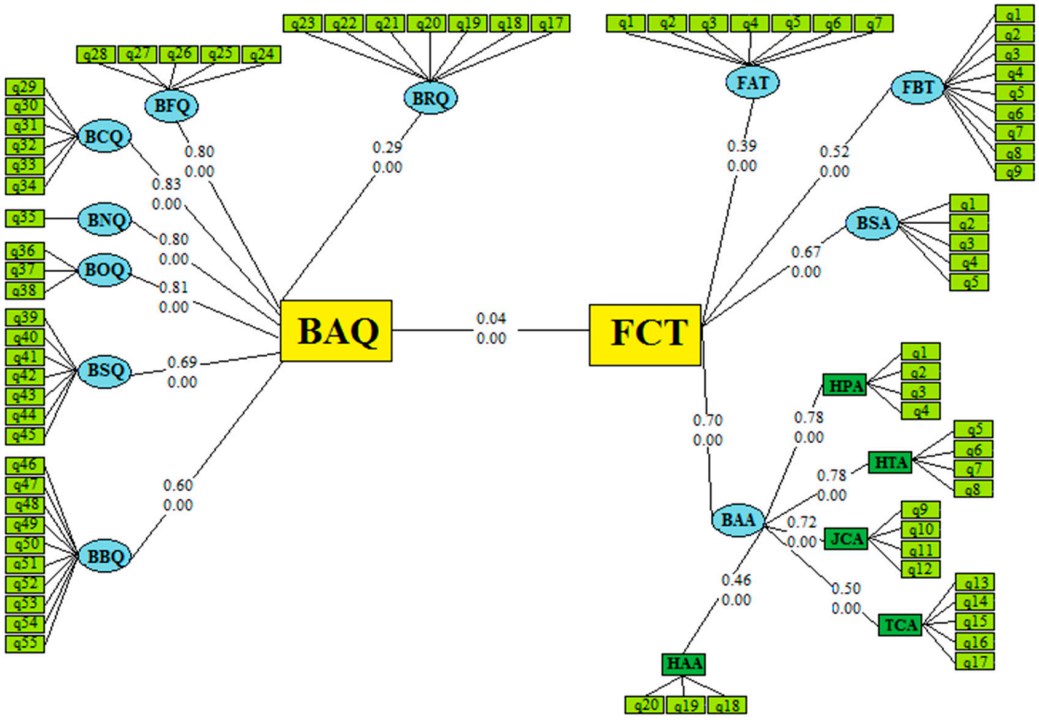

Figure 1. The effect of implicit and explicit variables on stock exchange data. Note: FCT is familiarity with blockchain technology (total questions); FAT is familiarity with blockchain technology, part 1; FBT is familiarity with blockchain technology, part 2; BAA is blockchain applications for accounting; HPA is hope (expectation of) to perform; HTA hopes to try; JCA is job communication; TCA is confidence; HAA is compatibility; BSA is blockchain applications for auditing; BAQ is quality of information (total questions); BRQ is relevance; BFQ is faithful representation; BCQ is comparability; BNQ is timeliness; BOQ is verifiability; BSQ is understandability; and BBQ is blockchain on the quality of information.

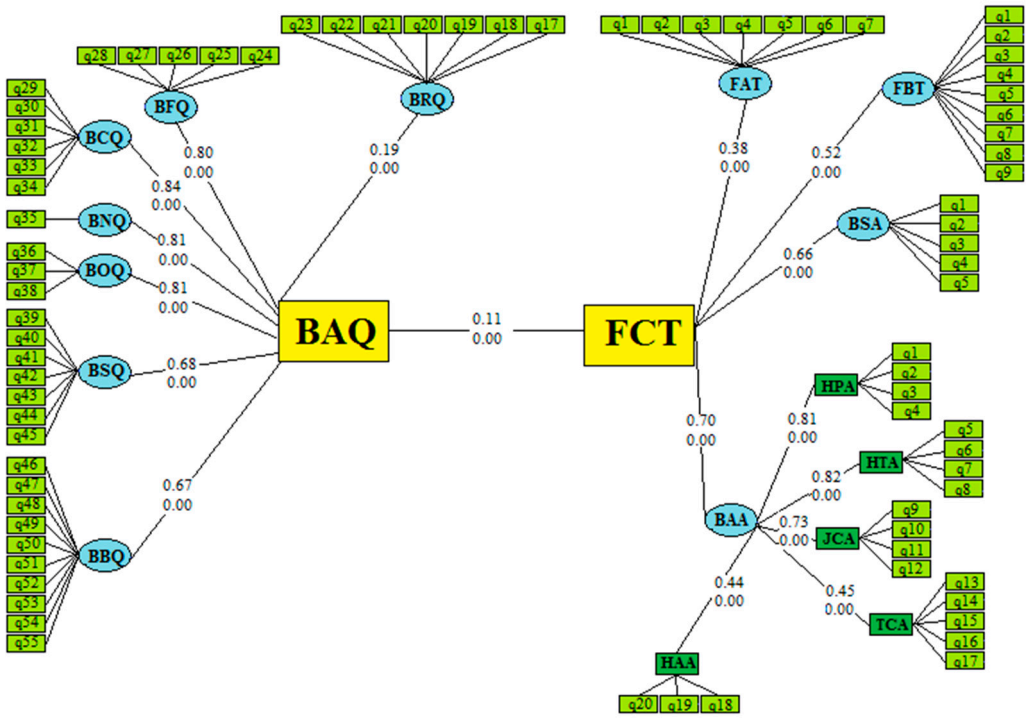

Figure 2. The effect of implicit and explicit variables on non-listed company data. Note: FCT is familiarity with blockchain technology (total questions); FAT is familiarity with blockchain technology, part 1; FBT is familiarity with blockchain technology, part 2; BAA is blockchain applications for accounting; HPA is hope (expectation of) to perform; HTA hopes to try; JCA is job communication; TCA is confidence; HAA is compatibility; BSA is blockchain applications for auditing; BAQ is quality of information (total questions); BRQ is relevance; BFQ is faithful representation; BCQ is comparability; BNQ is timeliness; BOQ is verifiability; BSQ is understandability; and BBQ is blockchain on the quality of information.

The empirical findings are reported in Table 9 as follows.

Table 9. The effect of familiarity with blockchain technology on the quality of information.

Variable	Model 1		Model 2		Model 3	
	Coefficient	*p*-Value	Coefficient	*p*-Value	Coefficient	*p*-Value
FCT	0.849	0.000	0.865	0.000	0.823	0.000
Gender	0.161	0.000	0.139	0.002	0.182	0.000
Age	0.092	0.000	0.084	0.001	0.102	0.000
Education	0.062	0.001	0.077	0.004	0.047	0.062
Major	0.046	0.003	0.065	0.007	0.035	0.095
Position	0.075	0.000	0.057	0.031	0.099	0.000
Experience	0.094	0.021	0.088	0.039	0.075	0.033
F Test	5738.00	0.000	3292.55	0.000	2454.80	0.000
Obs	1528		842		686	
R^2 Adj.	5.750		95.910		95.440	

Note: FCT is familiarity with blockchain technology (total questions); FAT is familiarity with blockchain technology, part 1; FBT is familiarity with blockchain technology, part 2; BAA is blockchain applications for accounting; HPA is hope (expectation of) to perform; HTA hopes to try; JCA is job communication; TCA is confidence; HAA is compatibility; BSA is blockchain applications for auditing; BAQ is quality of information (total questions); BRQ is relevance; BFQ is faithful representation; BCQ is comparability; BNQ is timeliness; BOQ is verifiability; BSQ is understandability; and BBQ is blockchain on the quality of information.

In order to check the demographic variables of the questionnaire and the familiarity with blockchain technology on the quality of the information in Table 9, the first models were used. The second model includes the data for all listed companies, and the data from non-listed companies were used in the third model. According to the results of the first model, familiarity with blockchain technology increases the quality of information. The variable coefficient of FCT is equal to 0.849, which is significant at the 99% confidence level due to the *p*-value of 0.000. It means that for both listed and non-listed companies, this coefficient has been estimated to be significant and positive at the 99% confidence level. Such findings argue that, in general, all companies existing in the Iraq business environment are expected to employ new technology, such as blockchain adoption, which is likely to improve the quality of their financial reporting ecosystem. In addition, according to model 2, which indicates the results of listed companies, the FCT coefficient is estimated to be equal to 0.865 with a *p*-value of 0.000, confirming our preliminary results. Moreover, consistent findings were obtained regarding the coefficient and *p*-value reported for model 3 for the FCT in non-listed companies, which were equal to 0.823 and 0.000. Additionally, the comparison between the coefficients suggests that familiarity with blockchain technology in listed companies has a greater effect on the quality of information compared to non-listed companies. Collectively, these findings propose that our first hypothesis, indicating a significant relationship between blockchain and the quality of accounting information in listed and non-listed companies, is accepted due to the *p*-value of 0.000 for model 1. Our second hypothesis, indicating the relationship between blockchain and the quality of accounting information is stronger in listed companies than in non-listed companies, is also accepted due to the greater coefficient of FCT (0.865) for model 2 in comparison to that of model 3 (0.823).

Finally, the results of other variables, including gender, age, and work experience, also positively and significantly affect the quality of information. It also means that the abovementioned variables are likely to substantially impact respondents' opinions about the quality of accounting information.

5. Discussion and Conclusions

Accounting is one of the sciences that provide the information needed to make decisions about the activities and performance of business units to institutions and businesses. This information is used in economic decisions made by many stakeholders inside and outside of the business unit as effective information based on which stakeholders will achieve profit and success (Abdelraheem et al. 2021). Accounting information will be useful if the information used is relevant and reliable to influence the behavior of decision makers (Norton and Porter 2011). One thing that guarantees the quality of information in today's destructive and high-risk environments is the application and use of IT (such as blockchain) in the information environments of companies. Thus, this study assesses the impact of blockchain applications on the quality of accounting information.

The results of the research hypothesis tests show that blockchain technology will likely positively impact the quality of financial reporting. This means that companies remarkably invested in IT applications are expected to have high-quality reports. In this regard, factors, such as more secure and fluent information flow in the working environment of a company, effectively implemented monitoring policy by authorities, reducing the workload of auditors, which in turn may lead to high-quality audit services and optimal contracts, are among the influential elements (Pilkington 2016) which lower the cost of data processing (Albashabsheh et al. 2018). Additional analyses also show that such an association exists in listed and non-listed companies; this means that factors such as greater environmental corporate governance, regulations, and restrictions governing listed companies compared to non-listed companies are not likely to have a different impact on the quality of financial reporting. Our results are in line with the research results of Thoa and Nhi (2022) and Khorashadi et al. (2017) who stated that IT (Blockchain) has a consistently positive effect on the quality of accounting information.

This study suggests some contributions. According to the outcome of this paper, CEOs, equity owners, accountants, auditors, and policymakers are likely to be benefited. The CEOs and equity owners are aware that the employment of the latest IT, such as blockchain applications, can reduce agency problems through the provision of high-quality financial reports. In addition, accountants and financial managers are aware that gaining the latest knowledge in IT-related fields is likely to provide them with further job opportunities and improve their capabilities in performing occupational tasks. Finally, auditors may use our findings to become familiar with blockchain technology in order to use it for planning and performing audit work, which is documented to reduce their workload. Finally, policymakers and regulatory bodies may use the outcome of our study to improve the market efficiency of Iraq, resulting in improved macroeconomic indicators, as previous findings have documented that microeconomic status has explanatory power to determine the macroeconomic indices such as GDP, growth dispersion (Daemigah 2020b), and unemployment rate (Salehi et al. 2021).

Similar to all the investigations, this study suffered from some limitations. Since blockchain technology is among the latest techniques in IT fields of study, the respondents of this paper, who were mostly financial experts, could not have accurate knowledge about the concept and practice of blockchain technology. Moreover, this paper is limited to the Iraq business environment; thus, its findings are primarily specified in this region, while broadening its domain may lead to different conclusions.

According to this paper's findings and specifications, some doors are open for future research. This could lead to an investigation into the impact of blockchain technology on the financial performance of companies. Furthermore, the influence of blockchain technology on the prevention of fraudulent activities such as money laundering and creative accounting might be plausible academic opportunities to explore.

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