

## **The impact of the use of block chain technology in improving the efficiency of the Iraqi banking sector**

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### **Abstract**

This research aims to measure the impact of the use of blockchain technology in improving the efficiency of the Iraqi banking sector. And its role in reducing the cost of banking services and developing them in the financial sector, represented by Iraqi banks. The extent to which the research sample accepts the adoption of this technology. The research community represents some Iraqi banks in Baghdad. There are ten banks with various branches, and these banks were represented by the following (five branches of Al-Rasheed Bank. Four branches of Al-Rafidain Bank, and Al-Taif Islamic Bank). The number of questionnaires distributed to auditors was (68), and (64) were retrieved, representing (94.1%). The remainder of the questionnaires, amounting to (4), i.e. (5.9%), are not suitable for statistical analysis and were analyzed using the SPSS statistical program. Where the blockchain technology will increase efficiency and economic returns and reduce costs and financial burdens. The results of the research concluded that blockchain technology represents the best technical solutions currently available. To reduce the material costs of operations in the financial sector. As well as, speeding up financial transactions. While ensuring the safety of financial transactions and transactions, and reducing manual procedures. It Contributes to meeting the needs of the financial sector of banks by eliminating the need for intermediaries, saving a measure of time and money helping reduce the operational cost to the lowest cost and improve the capital. It also contributes to enhancing transparency within the sector. Eliminating opportunities for human error in providing banking services, which ultimately contributes to enhancing operational efficiency and improving the quality of banking services provided to customers. The most prominent recommendations of the research were the need for Iraqi banks to rely on blockchain technology which contributes to reducing the cost of banking services, raising operational efficiency and taking effective measures to support its application.

### **Introduction**

Today, the world is witnessing a rapid and continuous development of electronic technologies, in which information technology and electronic technologies are considered. Specifically, the blockchain is an important resource that is no less

important than human and material resources (Abdulhakeem et al, 2021). This technology is an important tool for checking data automatically as well as ensuring its reliability. They can hold many surprises for many activities in different fields. Including accounting and auditing, and its use prevents fraud and manipulation of information and improves its integrity (Ali et al, 2020).

Blockchain technology is one of the most powerful technologies that revolutionized the world of innovation within the banking sector in the world. Which has received a lot of interest and research recently. It is considered one of the most important technologies affecting the economy (Chang et al, 2020). Where this foundational technology was created to upgrade the infrastructure of financial services to improve the quality of banking services provided to customers. Which has an impact on both local and international transfers, international trade, financing services and other banking transactions (Chen et al, 2020).

The research was divided into four aspects, the first of which included the research methodology. As for the second axis, it dealt with the theoretical aspect of blockchain technology and its use in the banking sector. The third aspect was devoted to analyzing the results and testing the research hypotheses. The fourth aspect included conclusions and recommendations.

### **The first section: research methodology**

#### **First - the research problem**

- 1- The research came to try to answer many of the questions that arise, namely:
- 2- Will blockchain technology find its way into the Iraqi banking sector?
- 3- Does blockchain technology in Saudi banks contribute to enhancing operational efficiency and reducing costs?

#### **Second - research objectives**

The research seeks to achieve some objectives, the most important of which are summarized as follows:

- 1- Understanding the reality of blockchain technology and its impact on the banking sector.
- 2- Review the most important applications of blockchain technology in the banking sector.
- 3- Clarifying the mechanism of blockchain technology and the nature of its positive impact on the banking sector.

#### **Third - the importance of research;**

Many experts believe that the introduction of blockchain technology in the banking sector helps in overcoming challenges related to speed of implementation, transparency of financial transactions, protection of information, preservation of its privacy, and reduction of costs. From this point of view, the importance of the current study stems from highlighting recent trends in banking and researching the

components and requirements for adopting this technology. As well as trying to analyze and evaluate chances for Zafar in its future bets.

#### **Fourth - research hypotheses**

The first hypothesis - there is no statistically significant relationship between the use of blockchain technology and the enhancement of operational efficiency in the Iraqi Egyptian sector.

The second hypothesis - the existence of a statistically significant relationship between the use of blockchain technology and the enhancement of operational efficiency in the Iraqi Egyptian sector.

#### **Fifth - Description of the research sample**

The research community represents some Iraqi banks in Baghdad. It has ten banks with various branches, and these banks were represented by the following (five branches of the Rasheed Bank, four branches of the Rafidain Bank, and the Islamic Spectrum Bank). The number of questionnaires distributed to auditors was (68), and (64) were retrieved, representing (94.1%). As for the remaining (4) questionnaires, which is (5.9%), it is not suitable for statistical analysis.

#### **The second aspect: the theoretical framework of the blockchain technology and its implications for the banking sector**

##### **First - the concept of the blockchain:**

Blockchain definitions are divided into three groups. The first group of researchers defined the blockchain from the technical side by explaining its components and mechanisms of action. It is a long string of encrypted data distributed to millions of computers and people around the world. This allows information to be entered and verified by many parties (Chen et al, 2019). As for the second group of authorities and researchers, they tended to link it more to encrypted currencies. Due to its appearance being associated with the emergence of cryptocurrencies. Garg, et al (2020) defined it as an ever-growing list of records called the blockchain. The third group of researchers defined the blockchain from the accounting side mixed with some technological concepts. Where (Govindan et al, 2022) defined it as a giant spreadsheet that accounting records all forms of assets by all parties participating in the network.

##### **Second - the importance of the blockchain:**

The blockchain works to achieve greater value for economic units by solving problems and trying to maintain the consistency of records (Hooper et al, 2020). Increasing coordination between stakeholders as well as improving information exchange, leads to a reduction in the time required and thus speeding up operations.

The most important aspect of the blockchain, which made it an unusual addition at present, is a database that is owned and managed by one party (Khalil et al, 2021). Concerning these aspects, they can be summarized as follows: -

1. Spread: There are many copies of the public ledger built on blockchain technology. Since there is no master copy, all participants have access to the full copy of the registry, and all these copies are identical and equal, and no party can control the registry.
2. Consistency: keeping an owned copy of the general ledger record with each subscriber. Operations cannot be changed and can only be added in the sense that the records of the blockchain are immutable.
3. Programming: Blockchains allow code to be stored on them. In addition, the ledger entries result in the preparation of daily entries automatically at run time. These are called smart contracts.

### **Third - Applications of Blockchain in Banks:**

Digital transformation has become a necessity for all banks that seek to develop and improve their services and facilitate their access to beneficiaries. This does not only mean the application of technology within the bank, but rather it is a comprehensive program that touches the institution and touches the way and method of its work mainly internally. One of the most important applications of this technology in banks is electronic exchange devices (ATM) (Kwok et al, 2019). Various smart applications via mobile phones for paying bills and purchases, using electronic payment cards, issuing credit cards, etc. (Martino, 2019)

According to the reports and recommendations of private international organizations and relevant governmental bodies. The following terms have been used to define distributed ledger technology tools since 2013 (tokens, coins, virtual currencies, cryptocurrencies, and digital financial assets) and the following have been introduced (Martino, 2021; Muminova et al, 2020):

1. Bank transfers: As digital currencies rely on, this technology can benefit traditional banks by increasing the speed of completing financial transactions and better verifying customers' identities (Naheem, 2019). Also, about digital currencies, there is cooperation taking place in this field with some banks, such as the technology on which the currency (ripple) relies. Which has become accepted by several foreign and Arab banks such as the Emirates Exchange Corporation.
2. Smart Contracts: This is a type of contract that can be executed automatically without the need for a trusted third party and the smart contract. It processes the value of transactions based on digital assets. When a smart contract is concluded in blockchain technology, a code is generated that manages and executes the operations according to the preconditions (Pal et al, 2021). There are a lot of smart contract applications, including what (Visa) created its cards for different categories of customers and exceeded the limits.

### **Fourth - The importance of applying blockchain technology in banks:**

The blockchain contributes to linking the governmental or private sectors to each other so that joint work can be carried out with high flexibility and harmony. The

need has become more urgent than ever before for the digital transformation of banks. This is mainly due to the rapid development in the use of information technology means and tools in all aspects of life. Whether it is related to transactions with the government sector or the private sector, or it is related to individuals (Perera et al, 2020).

The importance of applying blockchain technology in banks can be identified as follows:

1. Speed: banks tend to digital transformation and take advantage of artificial intelligence, blockchain technology and smart applications to facilitate and accelerate banking operations. Especially since customers prefer digital services, intending to improve the level of banking services. and increase its turnout.
2. Transactions: The main objective of the banking sectors of digital transformation and the benefit from artificial intelligence and the blockchain is to reduce the scope of bank transactions by modifying products and communication strategies to serve customers. Consequently, banks can no longer be satisfied with traditional services, but rather they must continue to develop to keep pace with customers' requirements. This casts a shadow over the future of banks in light of the increasing growth, as well as the speed of innovations and technological solutions in providing many digital financial services.
3. Transparency in service provision: Complete transparency within electronic organizations is a result of the presence of electronic monitoring, which ensures periodic monitoring of all services provided (Rijanto, 2021). E-management reduces expenditures in following up on the various management operations and reduces decision-making obstacles by providing a database linking it to decision-making centers and employing information technology. To support and build a positive institutional culture for all employees (Zachariadis et al, 2019).
4. Reducing administrative complexities: Electronic administration has contributed to radical changes in the level of procedures by converting it into a technical and reductive process that does not require much effort and time (Rijanto, 2021). This is done by providing the service continuously through the Internet, especially since this possibility is not restricted by time and place.

### **The third aspect is analyzing the results of testing the research hypotheses**

#### **First - Tests of validity and reliability of the questionnaire**

The application of validity tests the efficiency and accuracy of the research questionnaire paragraphs is the best representation, using the method of content validity by peripheral comparison. The researcher applies the reliability test to the data based on Cronbach's Alpha stability coefficient to confirm the reliability of the data obtained from the sample's answers to the research questionnaire paragraphs. Especially since the condition of skipping the data for the tests of validity and reliability. It is one of the most important conditions that must be met in the



paragraphs of the research questionnaire to be valid for the adoption of its results in scientific research. The results of applying these tests were as follows: Testing the validity of the content in a peripheral comparison of the use of blockchain technology in the banking sector.

The content validity method was applied by terminal comparison to prove the validity of the items of the examination questionnaire in representing what was set for the best representation. This method is based primarily on the method (T-TEST) related to the comparison between two averages. After arranging the data either in descending or ascending order, 27 per cent of the data was withdrawn from the top and bottom of the data according to the requirements of the steps of the method of validating the content in the peripheral comparison. The validity condition will be fulfilled in the examination questionnaire data when the calculated T value is significant. This is if the probability value is less than or equal to the significance level of (0.05). It benefits from the method of validity of the content by the peripheral comparison to confirm that the twenty paragraphs in the research questionnaire represent the use of blockchain technology in the banking sector as the best representation.

**Table 1. The results of the content validity test by terminal comparison**

Explanation	Expected value	T-TEST	Variable
The condition of validity of the content was achieved by using a series technique effect of blocks on improving efficiency The banking sectors	0.00	10.654	The impact of using blockchain technology in improving efficiency in the sector Iraqi banker

## 2. - Test of stability of the questionnaire

**Table 2. The results of the reliability test (Cronbach's Alpha) for the research questionnaire items**

Explanation	Stability coefficient	Variable
Overcoming the dimension of using blockchain technology in the banking sector Iraqi for stability test successfully	0.755	Use of block chain technology Iraqi banking sector

Table (2) confirms that the value of the stability coefficient (Cronbach's Alpha) for the total items using blockchain technology in the Iraqi banking sector has recorded a stability coefficient of (0.755), which is more than (0.700). This confirms the existence of high stability in the paragraphs of using the block chain technology in the Iraqi banking sector.

Third - the descriptive analysis of the level of the sample's responses to the paragraphs of the effect of using the block chain technology in improving efficiency in the Iraqi banking sector.

For an interpretation of the data of the statistical analysis of the research (the effect of using the block chain technology in improving efficiency in the Iraqi banking sector).

Based on the weighted arithmetic mean scale to diagnose the level of the sample's responses to the paragraphs of the research questionnaire. While the researcher relies on the standard deviation measure to diagnose the extent of the sample's responses being dispersed. To determine the intensity of the sample's answers and the percentage of their agreement on the paragraphs of the research questionnaire, the researcher uses the relative importance scale. While the researcher relies on the standard coefficient of difference for the purposes of comparison between the sixty paragraphs. As for diagnosing the direction of answering the paragraphs (towards agreement on the content of the paragraph or towards disagreement on the content of the paragraph). The researcher uses the hypothetical mean that represents the dividing line between disagreement and agreement within the answers of the research sample and the amount (3) according to the five-point Likert scale adopted in the current research. The researcher also relies on the gradations of the strength of the answer's matrix, which shows the level of respondents' response to the questionnaire items.

**Table 3. The level of the studied sample's responses to the paragraphs on the impact of the use of blockchain technology in improving the efficiency of the banking sector.**

Items	Mean	Std.D	Importance rate %	Deference factor%
The use of the blockchain in banking systems leads to the availability of appropriate audit evidence at the appropriate time due to the immediate availability of information.	3.716	1.479	71.57%	41.33%
Auditing based on blockchain technology improves the auditor's ability to detect bank fraud.	3.814	1.033	82.16%	25.15%
Auditing based on blockchain technology leads to reduced cost and time, better data analysis and leads to faster reporting, so audit quality will improve	3.559	1.361	71.37%	38.13%
Blockchain contributes to increasing the level of audit quality by avoiding manipulation and fraud due to reliable records.	3.912	1.2	77.45%	30.98%
Blockchain availability Super-fast transaction validation	3.745	1.298	77.25%	33.59%
Blockchain contributes to improving the efficiency of financial transactions, assets and data while addressing issues such as privacy and security.	3.677	1.241	76.86%	32.29%
Since the blockchain technology will perform immutable transactions, the auditor may get instant reports.	3.657	1.383	71.18%	38.86%
Blockchain improves the detection of physical faults, finding fraud indicators.	3.373	1.394	73.53%	37.92%
Blockchain technology could fundamentally change the banking books	3.647	1.195	78.24%	30.55%
Because it is a decentralized and immutable ledger.				
The blockchain allows tracking of all transaction steps	4.48	1.187	73.53%	32.29%
Providing audit service with the best quality.				
Blockchain helps with a more comprehensive risk assessment, which helps assessing and addressing problems.	3.559	1.35	72.35%	37.32%
Blockchain helps audit firms find the right solutions problems and generate tremendous value for the services provided by them.	3.667	1.28	76.27%	33.56%
Blockchain allows for the size and scaling of audit evidence to be increased and performed	3.755	1.286	78.04%	32.96%
New analyzes, summarized, explained and utilized.				
The blockchain reduces the issuance of personal judgments and the preparation of estimates by the banker and the auditor due to the increase	3.569	1.323	75.10%	35.24%

in the level of accuracy and confidence.				
Blockchain contributes to positive changes in audit planning risk assessment and analytical audit procedures.	3.618	1.309	73.14%	35.79%
The blockchain improves the quality of audit work through the availability of the features of relevance and reliability, and an increase in the quality of banking information.	3.765	1.214	80.59%	30.13%
Blockchain can automate audit checks and settlement processes	3.637	1.344	73.53%	36.55%
And confirmation and ensure continuous monitoring and traceability.				
Blockchain-based auditing reduces paperwork for auditors, improves visibility, and automates transactions.	3.618	1.421	67.45%	42.12%
Blockchain enables auditors to use better methods of gathering evidence.	3.677	1.285	74.31%	34.58%
Blockchain can reduce the expectations gap between auditors, users of financial statements, and regulators.	3.52	1.348	72.75%	37.07%
Use of blockchain technology Iraqi banking sector	3.698	1.297	74.83%	34.82%

It is inferred from Table (3) that the value of the weighted arithmetic means of the variable using blockchain technology in the Iraqi banking sector amounted to (3.698). It is greater than the hypothetical mean value (3). The value of the weighted arithmetic means for this dimension came within the category between (from 3.4 to less than 4.2) in the gradients of the respondents' strength matrix. To confirm this, the level of the sample's answers to the overall paragraphs of the impact of using blockchain technology in the Iraqi banking sector. It tended towards an agreement with a high level and a standard deviation of the dimension of the effect of using blockchain technology in improving the efficiency of the Iraqi banking sector (1.297). And a standard difference coefficient amounted to (34.82%). This shows the homogeneity of the sample's answers regarding the paragraphs on using blockchain technology in the Iraqi banking sector. The relative importance of using blockchain technology in the Iraqi banking sector was (74.83%). This shows the agreement of about three-quarters of the research sample that the bankers and auditors of the research sample are convinced of the use of blockchain technology in the Iraqi banking sector. It can also be seen from Table (3) that the levels of importance of the paragraphs within the variable of using blockchain technology in the Iraqi banking sector were distributed among the lowest levels of standard difference recorded by paragraph (2). It reached (25.15%) among all items using blockchain technology in the Iraqi banking sector. It is documented that there is a higher homogeneity between the answers of the sample members regarding paragraph (2) within all the variable paragraphs. With a strong response to paragraph (2), it recorded (82.16%). This confirms the agreement of most of the research sample that auditing based on blockchain technology leads to improving the auditor's ability to detect bank fraud. Table (3) documents that paragraph (18) recorded the largest level of standard difference coefficient (42.12%) among all paragraphs on using blockchain technology in the Iraqi banking sector. This documents the existence of less homogeneity among the respondents' answers regarding paragraph (18), and the intensity of the response to the paragraph was recorded (67.45%). Confirming the agreement of more than two-thirds of the sample studied. Blockchain-based auditing reduces paperwork for auditors, improves visibility, and automates transactions.



It is inferred from Table (3) and based on the rule (the lowest coefficient of difference value is the best when making comparisons, as it documents higher homogeneity in the sample answers). Auditors are moderately interested in the fact that the blockchain provides an opportunity for auditors to provide administrative advice on the ability of this technology to provide complete, accurate, updated and verifiable records. And help the auditor to reduce the issuance of personal judgments and the preparation of accounting estimates. In addition to blockchain technology, the auditor can deal with variable and sometimes conflicting data. And organized and unorganized data at other times. Blockchain technology contributes to reducing the costs of storing financial information by increasing the demand for skilled auditors to perform modern functions affected by this technology. The auditor needs to adapt and upgrade technological skills and prepare for the changes brought about by this technology in the auditing profession. The blockchain also allows checking all customer data instead of the sampling method and leads to the use of the blockchain in accounting systems. The availability of sufficient credible audit evidence, in addition to the blockchain, enables the auditor to use better methods to collect evidence and clues. Improving the susceptibility and ability of auditing firms to audit the various activities in the units. Addressing problems related to the loss of documentary evidence and the lack of an audit trail. Blockchain technology will reduce the role of traditional accounting and help the blockchain with the ability to perform some complex audits more easily.

It is inferred from Table (3) and based on the rule (the lowest coefficient of difference value is the best when making comparisons, as it documents higher homogeneity in the sample answers). Auditors are subduedly concerned that blockchain technology has the potential to reduce auditors' workload. Improving current processes and the possibility of positive change in the roles of accountants and auditors. In addition, blockchain technology affects audit risks by reducing human errors and replacing manual examination with electronic systems. The adoption of the economic units of the blockchain contributes to the achievement of data integrity and a high level of data quality.

## **Conclusion and recommendations**

### **First - conclusions**

- 1-The availability of blockchain technology, speed in activating financial transactions, the absence of mediation, reducing costs, enhancing functionality, and supporting privacy and confidentiality.
- 2- Applications of blockchain technology in the banking field include trade finance, payment systems, money markets, as well as customer recognition.
- 3- The use of blockchain technology in the field of banking contributes to reducing the time and material costs of banks and customers, achieving transparency and security, and reducing fraud.

4- Facing competition between banks in light of modern technological transfers, and strengthening and upgrading banking services.

5- The adoption of blockchain technology in Iraqi banks also contributes to achieving many positive results that will enhance cost reduction, increase the operational efficiency of these banks, and improve and develop their banking services.

## Second - Recommendations

The most important recommendations of the research were:

1- The need for Iraqi banks to rely on the use of blockchain technology, which will contribute to reducing costs related to remittances, and raising the operational efficiency of these banks.

2- Increasing customer dependence on it without resorting to international banks that have already begun to adopt this technology.

3- Take effective measures to support its application, especially in the light of its positive results in improving the quality of service, according to both the global experiences of international banks and the results of the field study in Iraqi banks.

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