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# **THE IMPACT OF EMERGING TECHNOLOGIES OF THE FOURTH INDUSTRIAL REVOLUTION ON THE QUALITY OF ACCOUNTING DISCLOSURE IN FINANCIAL REPORTS: A FIELD STUDY ON A SAMPLE OF IRAQI PRIVATE BANKS LISTED IN THE IRAQ STOCK EXCHANGE**

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## **Abstract**

The research aimed to study and analyze the impact of Fourth Industrial Revolution technologies on the quality of accounting disclosure through the information disclosed by Iraqi banks in their published financial reports, And learn about the most important of these emerging technologies that work to improve the level of disclosure in published financial reports, which contributes to providing opportunities for competition in the stock market. This is done by applying it to a sample of Iraqi private banks. The descriptive analytical approach was adopted and the questionnaire was used as a tool for the study. While the study found a significant effect between the emerging technologies of the Fourth Industrial Revolution and the quality of accounting disclosure at a significance level of (0.01). The study recommended the need to increase awareness among bank managements of the importance of applying these technologies through diversity, volume and speed of data processing, keeping pace with technological progress and the ability to compete in the stock market.

**Keywords:** Emerging technologies, accounting disclosure quality, financial reports, commercial banks.

## **Introduction**

The successive changes and developments in the global and economic environment have made companies work to keep pace with the digital revolution, which provides new opportunities, and this requires searching for the best ways to meet the increasing market requirements with better quality and speed, and developing the main work systems is the key to transforming challenges into opportunities and achieving positive business results for companies, and these developments have become the basics of work in companies and important means that help them survive and continue (Al-Anzi, 2023)

The Fourth Industrial Revolution, through digital technologies, has contributed to an unprecedented ability to process and store large amounts of information and data, which has helped reduce operations costs through speed and accuracy in data processing. (Al-Khasawneh, 2022)

Emerging technologies aim to provide more accurate, faster, comprehensive, transparent and valuable accounting information to internal and external users, as it can enable new ways to create, process and disclose accounting information, specifically on the quality of accounting disclosure (Hamed, 2024). Since financial reports are the only legitimate means of communication between the establishment and its stakeholders, therefore, attention to the quality of the information disclosed in terms of its suitability, objectivity, timeliness, transparency and reliability, In addition to the interest in the extent to which the amount of asymmetry in information can be reduced by taking advantage of modern technologies that may be a means of improving accounting information and enhancing its quality, and thus improving accounting disclosure and enhancing its quality. (Al-Qarawi, 2024)

**The problem of the study is represented by the following question:**

**What is the extent of the impact of the emerging Fourth Industrial Revolution technologies on the quality of accounting disclosure in the financial reports disclosed by private Iraqi banks?**

### **1. The concept of the fourth industrial revolution**

The achievements of the Fourth Industrial Revolution in the field of accounting have brought about a major transformation in how financial data is managed and accounting processes are implemented. This revolution has benefited from digital technologies to enhance the accuracy of financial reports and speed up auditing processes, to enhance the accuracy of financial reports and accelerate auditing processes. Automation and big data analysis have also made it possible to improve the effectiveness of financial planning and enhance strategic analysis. In addition, technology has contributed to enhancing cyber security, which ultimately achieves better protection of financial data. The achievements and importance of the Fourth Industrial Revolution in accounting and auditing constitute a very important step in improving and enhancing the efficiency, accuracy and effectiveness of financial operations management (Abdullah, 2024). Industrial Revolution 4.0 (IR 4.0) is defined as a scientific field that combines engineering, computer science and related disciplines to design machines and programs with human feedback. (Ismail, Marzuki, & Lode, 2024). Researchers believe that emerging technologies such as big data analytics, artificial intelligence, virtual reality,

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machine learning, robotics, and cloud computing have provided many services and products of high quality and efficient business processes, which are widely used worldwide.

### **2.1 The importance of the Fourth Industrial Revolution**

The importance of the Fourth Industrial Revolution is represented in the following: (Al-Anzi, 2023)

- Integrating the fluctuations that emerged in the previous three industrial revolutions in a way that helps remove and address the dividing lines between different fields whether they are physical digital or biological in nature.
- The increase in the volume of information data computing power and communications has led to the emergence of new networks with a wide range and low power.
- Emerging technologies such as advanced robotics and 3D printing are helping bring digital instructions into the physical world.
- Increasing the level of machine intelligence through the continuous accumulation and analysis of data, leads to an unprecedented increase in the ability to process financial data as well as the enormous capacity for storage and knowledge.
- Helping to make transformations that link the physical and virtual digital worlds represented by digital industries for materials, raw materials and resources used in industry, and the smart digital factory and its private warehouses.

### **2.2 Fourth Industrial Revolution Technologies**

Digital technologies are considered the appropriate and modern environments for accounting work, as technological systems have become characterized by high accuracy, complexity and progress, as these systems include a group of numerous technologies that can be explained as follows: (Al-Khasawneh, 2022)

- **Big Data:** The huge amount of data that is generated, processed, and then stored through emerging technologies, and this data is used to make sound decisions. (Alkhafaji, et al, 2024).
- **Blockchain:** It is a technology that helps accountants accurately prepare accounting information, disclose it in a timely manner, and collect and prepare accounting information that is characterized by value and high quality. (Al-Khafji and Dashtbayaz, 2023).
- **Cloud computing:** Cloud computing aims to strengthen the links between the organization, customers, suppliers and other relevant stakeholders, facilitating the transfer, exchange and communication of data between different departments and branches within the organization. Moreover, it allows users to collect, analyses, process and store data. (Almanaeseh, et al., 2024).
- **Artificial intelligence:** Artificial intelligence is "the science of teaching programs and machines to complete tasks that usually require human intelligence (Osamor & Adeniran, 2020), Which enhances artificial intelligence for the sustainable and efficient use of resources, as companies can rely on this data to help users in the process of forming accurate predictions to make wise decisions. (Shiyyab, & et al, 2023).

Researchers believe the importance of companies adopting emerging technologies because of their major role in the field of accounting and commercial business and because they allow

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companies to remain able to keep pace with developments and work in financial markets and remain competitive.

## **2. Quality of accounting disclosure**

The quality of accounting disclosure plays an important role in highlighting the value and usefulness of accounting data and information and is used in making various decisions related to investment and financing. It also contributes to achieving the effectiveness and efficiency of exploiting the economic resources available to the organization.

### **2.1. What is the quality of accounting disclosure**

Accounting disclosure changes with the change in the concept and requirements of the environment in which it operates according to a set of different factors. The degree of disclosure also depends on the objective of the financial reports and the quantity and quality of information included in these reports and various lists and levels of accounting disclosure, which has affected the multiplicity of trends in defining accounting disclosure. (Hassan, 2016).

Accounting disclosure is defined as “providing information and data to users in a secure, correct and appropriate manner to help them make decisions, so it includes both internal and external users.” (Rahmon, 2019).

The quality of accounting disclosure is defined as “the quantity and content of accounting information that is relevant, reliable and comparable and reflects the events and transactions that have taken place and have been disclosed to help the beneficiary parties to help them in making decisions.” It is the expression of the future visions and goals of the economic unit to shareholders and parties related to the economic unit, which encourages the creation of value for the economic unit. (Zahid and Ismail, 2023).

The quality of accounting disclosure is very important because it helps reduce the risk of financial errors and makes it easier for users to compare, analyze, predict and invest. Among the users interested in accounting information are investors, lenders, regulators, analysts, auditors and others who rely on accounting disclosure to assess the organization's financial performance and position. (Hamed, 2024).

### **2.2. The importance of accounting disclosure quality**

Financial data is the main source for users to make decisions, and there are many entities that use this data, so disclosure must be honest and fair to meet all the needs of users from lenders, investors, government agencies, researchers, etc. Accounting disclosure is defined as the process of disseminating financial and non-financial information in a timely manner, which results in making this information contained in financial reports clear, understandable, non-misleading and relevant to users and third-party stakeholders to help them make sound decisions regarding the company. (Al-Tamimi, 2020).

Researchers believe that adopting accuracy in applying the qualitative characteristics of accounting information contributes to increasing the quality of accounting disclosure, and the business environment plays an important and major role in the ease of applying these characteristics in order to enhance accounting disclosure and improve its quality.

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### **2.3. Methods of measuring the quality of accounting disclosure:**

There are several methods for measuring the quality of accounting disclosure and will be discussed as follows - (Zahid and Ismail, 2023):

- Meeting users' needs: The quality of disclosure is measured by the extent to which the information meets the needs of users and stakeholders, and it is criticized according to the different points of view of its users, some of whom view it from a quality perspective and from another user's point of view not.
- Disclosure of specific and highly influential items: This method relies on the method of focusing disclosure on a set of specific information in the financial report that is considered influential on investors' decisions. One of its drawbacks is that it does not reflect the complete picture of measuring the quality of accounting disclosure.
- Quantity of disclosed information: The quality of accounting disclosure increases as the quantity of disclosed information increases.

### **2.4. Factors affecting the quality of accounting disclosure:**

The quality of disclosure is affected by several factors, and these factors can be divided into: (Hamed, 2024)

- Factors related to the economic institution, such as its size, activity, ownership, performance, risks, and level of control and maintenance.
- Factors related to the type of users and the nature of their needs, such as their interests, goals, knowledge, experience, preferences, and requirements.
- Factors related to the bodies responsible for setting disclosure standards, such as accounting, financial, legislative, regulatory, professional, academic, and financial market bodies.
- Factors related to international organizations and institutions, such as the International Federation of Accountants, the International Accounting Standards Board, the World Bank, the International Monetary Fund, and the International Organization for Integrated Financial Reporting.

Through this study, we will show the impact of emerging technologies (artificial intelligence, big data, blockchain) on the quality of accounting disclosure and how to benefit from these technologies in enhancing the quality of accounting disclosure.

## **3. Emerging technologies and their relationship to the quality of accounting disclosure in financial reports**

The impact of Fourth Industrial Revolution (4IR) technologies on the financial performance of companies listed on the Egyptian Stock Exchange. The study sample consisted of analyzing annual reports, financial statements, and sustainability reports from 14 prominent Egyptian companies. The results indicate that companies with higher levels of disclosure of Fourth Industrial Revolution technology generally show stronger financial performance (Farid, 2024). One study showed that big data analytics can directly impact financial scheduling procedures and prepare financial reports faster, leading to increased transparency and reliability in these reports. These precise measures can therefore enhance investor and



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stakeholder confidence in financial information that accurately represents a company's performance. (Alkhafaji & et al, 2024).

The study (Shen, 2023) found that big data technology helps improve the validity, usefulness, and comparability of the information disclosed by companies. A study (Zaqeeba, & et al, 2024) found that by measuring block chain technology in commercial banks' financial reporting, it has the potential to improve financial market efficiency, trust, and transparency. Accounting academics, block chain engineers, regulators, and business professionals will need to work collaboratively to address these issues and advance our knowledge of how block chain impacts the accuracy of financial reporting.

As for the study (Alkafaji & Dashtbayaz, 2023), it aimed to demonstrate the impact of blockchain technology on the quality of computer information. The study found that blockchain technology has a positive impact on the quality of financial reports, meaning that companies that invest heavily in information technology applications can obtain high-quality reports.

As for the study (Shiyyab et al. 2023), which examines the impact of disclosing terms related to artificial intelligence on financial performance, the study found a steady increase in the mention of disclosing terms related to artificial intelligence, and the results indicate that disclosing keywords related to artificial intelligence has an impact on performance. Financial banks.

While the study (Jejenywa, & et al, 2024) showed the role of artificial intelligence in improving the quality and timeliness of information in financial reports in creating comprehensive and useful financial reports. Which also enhances the communicative value of financial information to stakeholders.

The study (Almanaeseh et al., 2024) also aimed to demonstrate the impact of cloud technology on the integrity of the financial statements of Jordanian industrial companies across a group of variables (financial position, income, cash flow, and equity). The investigation included employees from the finance and internal audit departments, including various job titles. The study found that there is an impact of cloud accounting on the quality of financial statements according to the dimensions of (balance sheet, income statement, cash flow statement, and owner's equity list).

The study (Kamal, 2023) examined the impact of cloud computing on the quality of accounting information and the extent of its compliance with international financial reporting standards. The study concluded that there is a positive impact of the use of cloud computing on the quality, reliability and credibility of accounting information.

From the above, researchers believe that emerging technologies have an important role in improving the quality of accounting disclosure, as the presence of these technologies has significantly reduced the risks that banks may be exposed to by providing high-quality financial reports that contribute to helping users make sound decisions. In order for financial reports to be sound and useful to users, these reports must meet their needs for the information they contain, taking into consideration the extent to which this information has the characteristics of accounting information, which must be represented faithfully, comparable, understandable, and timely. All of this enhances the usefulness of financial information.

**From the above, the following hypotheses can be formulated:**

- H1 There is a significant effect between the emerging technologies of the Fourth Industrial Revolution and the quality of accounting disclosure in financial reports in Iraqi commercial banks.
- H2 There are significant differences between the paragraphs of the research sample regarding the impact of emerging technologies on the quality of accounting disclosure of financial reports.
- H3 There are significant differences between the paragraphs of the research sample regarding the importance of disclosure quality indicators in financial reports.

**4. Field study:**

**Statistical analysis results:** Statistical analysis can be performed through several steps that can be explained as follows:

**First: Study population and sample**

The study population represented the Iraq Stock Exchange, while the study sample was represented by private banks listed on the market. A questionnaire form was prepared and distributed electronically to the study sample. The number of responses reached 80 questionnaires and was analyzed using the SPSS program.

**Second:** A statement of the measurement, stability and validity of the questionnaire phrases that were relied upon in collecting data using Cronbach's alpha coefficient, where the results shown in Table (1) appeared as follows:

**Table (1) Value of validity and reliability for the research variables**

Variables	( $\alpha$ ) Cronbach's alpha reliability coefficient	Reliability coefficient
Impact of emerging technologies of the Fourth Industrial Revolution	0.763	0.869
Quality of accounting disclosure in financial reports	0.734	0.847

**Source:** Prepared by researchers based on statistical results.

It is clear from Table No. (1) that the Cronbach's alpha values ranged between (0.734 - 0.763), and since the test statistic is supposed to be no less than (0.7), it can therefore be said that these values are acceptable and reflect the extent of stability and confidence in the variables specific to the research, which confirms their validity for the rest of the analysis stages.

**Third: Descriptive statistical analysis**

The results of the descriptive statistical analysis of the research sample according to demographic characteristics were as follows:

**Table (2) Demographic description of the sample items.**

variable	Category	Repetition	p.c.
Academic achievement	Higher degrees	36	45%
	Bachelor's	44	55%
Function	manager	12	15%
	programmatic	17	21.25%
	accountant	29	36.25%
	Auditor	22	27.5%
Years of experience	Under 10 years	27	33.75%
	10 years and less than 20 years	23	28.75%
	20 years and more	30	37.5%

**Source:** Prepared by the researchers based on the results of the (Descriptive statistics - Frequencies) test.

**Table No. (2) shows the following:**

- Regarding the academic qualification, the percentage of bachelor's degree holders was (55%) of the total sample, followed by higher degrees at (44%) of the total sample.
- Regarding the job, the researchers found that (36.25%) of the total sample size were accountants, while the percentage of auditors was (27.5%), while the percentage of programmers was (21.25%), while the percentage of managers came in last place with a value of (15%).
- As for the number of years of experience for the research sample, it was found that (37.5%) of the total sample size had more than 20 years of experience, while the percentage of those with less than 10 years was (33.75%), while the percentage of those with years of experience ranging between 10 and less than 20 years was (28.75%).
- From the above, it can be said that the study sample contains a group of scientific and practical competencies that enable it to answer the questionnaire paragraphs in a manner that is characterized by objectivity and accuracy.

#### **Fourth: Testing the study hypotheses**

**H1:** There is a significant effect between the emerging technologies of the Fourth Industrial Revolution and the quality of accounting disclosure in financial reports in Iraqi commercial banks.

The results of the statistical analysis to test the above hypothesis were as follows:

**Table (3) Results of analyzing the impact of using emerging technologies on the quality of accounting disclosure (first hypothesis).**

Independent variable	Dependent variable	F (Sig)	(Sig) T	$\beta = (R)$	R <sup>2</sup>
Impact of emerging technologies of the Fourth Industrial Revolution	Quality of accounting disclosure in financial reports	56.917 )0.000(	7.559 )0.000(	0.645	0.428

**Source:** Prepared by researchers based on statistical results.



**The previous table No. (5) shows the following:**

- The stability of the regression model is noted, as the value of (F) reached 56.719, which is statistically significant at a significance level of less than 0.01.
- The significance of the regression coefficients for the requirements of applying financial inclusion and the fixed limit is stable, as the value of (t) for the requirements of applying financial inclusion reached 7559 at a significance level of (0.01).
- It is noted that the values of (R) and ( $\beta$ ) reached (0.645), indicating that there is a significant positive impact of emerging technologies on the quality of accounting disclosure of financial reports with a regression coefficient of (0.656) at a significance level of (0.01).
- The value of  $R^2$  (0.428) was , which indicates that emerging technologies explain 43% of the changes that occur in the level of accounting disclosure quality of financial reports, while the rest of the percentage is due to other variables that were not addressed by the model.

From the above, it is clear that there is a significant effect between emerging technologies and the quality of accounting disclosure in financial reports, which confirms the role of these technologies in enhancing and improving the quality of accounting disclosure.

**H2:** There is a significant difference between the paragraphs of the research sample regarding the effects of emerging technologies on the quality of accounting disclosure in financial reports.

The results of the statistical analysis to test the hypothesis are shown in Table (3):

**Table (3) Results of testing the second hypothesis.**

Ferry No	Arithmetic average	Standard deviation	T	Morale level	Sign
1	2.7255	0.48567	48.294	0.000	moral
2	2.6525	0.36501	37.079	0.000	moral
3	2.3758	0.70300	32.377	0.000	moral
4	2.5500	0.69468	38.669	0.000	moral
5	2.8000	0.66029	42.104	0.000	moral
6	2.4348	0.72781	31.299	0.000	moral
7	2.5887	0.73280	32.875	0.000	moral
Total	2.5856	0.35067	67.894	0.000	moral

**Source:** Prepared by researchers based on statistical results.

**Table No. (3) shows**

- It is noted that the level of awareness of the research sample was relatively high regarding the implications of emerging technologies on the quality of accounting disclosure of financial reports, as the arithmetic averages reached (2.3758) as the lowest value for paragraph (3), which indicates the awareness of the research sample that these technologies can directly contribute to enhancing and improving the accuracy, comprehensiveness and objectivity of the disclosed financial information, while the standard deviation reached (0.70300), which indicates the existence of a degree of variation in the opinions of the research sample.

- (2.8000) with a standard deviation of (0.66029) for statement No. (5), which states that emerging technologies provide advanced tools for processing and analyzing data more effectively and quickly, which enhances the transparency of accounting disclosure and provides accurate and reliable information to investors, reflecting their approval of it with a very high degree of approval.
- It is also noted that all values of (t) were statistically significant, which indicates that there is a significant difference in the opinions of the study sample regarding the indicators that were used in order to know the extent of their awareness and knowledge of the implications of emerging technologies on the quality of disclosure.

The accounting for financial reports, which came in favor of their approval of the importance of its prominent role in the banking sector at a relatively high degree.

**H3:** There are significant differences between the paragraphs of the research sample regarding the importance of disclosure quality indicators in financial reports.

The results of the statistical analysis to test the hypothesis appeared as shown in Table (4):

**Table (4) Results of testing the third hypothesis**

Ferry No	Arithmetic average	Standard deviation	T	Morale level	Sign
1	2.5150	0.62805	35.444	0.000	moral
2	2.6925	0.588944	41.879	0.000	moral
3	2.7500	0.56589	45.158	0.000	moral
4	2.6225	0.71630	37.311	0.000	moral
5	2.6385	0.75431	30.445	0.000	moral
6	2.4573	0.77148	27.968	0.000	moral
7	2.7800	0.53921	46.778	0.000	moral
Total	2.6350	0.30466	57.154	0.000	moral

**Source:** Prepared by researchers based on statistical results.

Table No. (4) shows

- It is noted that the level of awareness of the research sample was relatively high regarding the indicators of disclosure quality in financial reports, as the arithmetic averages reached between (2.4573) as the lowest value for paragraph (6), which indicates that the respondents have a high awareness that transparency, documentation of information, adherence to accounting standards, and provision of accurate and reliable information are among the most important necessary requirements, while the standard deviation reached (0.77148), which indicates the existence of a degree of variation in the opinions of the research sample.
- And (2.7800) with a standard deviation of (0.53921) for statement No. (7), which states that the existence of continuous monitoring and evaluation mechanisms for accounting disclosure processes can improve its quality, reflecting their approval of it with a very high degree of approval.
- It is noted that all values of (t) were significant, which indicates that there is a large difference in the opinions of the study sample regarding the indicators that were used to

determine the extent of the research sample's awareness of the importance of quality disclosure in financial reports, which came in favor of their agreement on the necessity of its availability in the banking sector to a high degree. relatively.

### **Results and Recommendations**

- Emerging technologies contribute to improving the quality of accounting disclosure in banks' financial reports because they contribute significantly to the possibility of quick, accurate and timely access to accounting information, whether financial or non-financial.
- Emerging technologies are improving the quality of financial reporting disclosure because they significantly contribute to enhancing transparency and ease of understanding for investors and stakeholders and thus helping them make sound decisions.
- The results of the field study showed that there is a statistically significant effect between the study variables represented by the emerging technologies of the Fourth Industrial Revolution and the quality of accounting disclosure at a significance level of (0.01).
- The study sample's awareness of the importance of the implications of emerging technologies on the quality of accounting disclosure of financial reports, in addition to the availability of disclosure quality requirements in financial reports.

### **Recommendations**

- The need to increase awareness among bank managements about the importance of applying these technologies in terms of diversity, size and speed in data processing and to keep pace with technological progress and competitiveness.
- Working on holding workshops and training courses for technology providers and users in the field of technology, in order to recognize its importance in enhancing the quality of accounting disclosure of financial reports.
- The need to work on protecting the confidentiality and security of information by using a specialized team that is distinguished by its efficiency and experience in the field of technology and working on issuing legislation and regulations that contribute to increasing information security.
- The need to invest in the field of emerging technologies as they contribute to processing transactions and improving the quality of disclosure by preparing high-quality financial reports.

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