

THE IMPORTANCE OF THE INTERNET OF THINGS (IOT) IN IMPROVING THE EFFICIENCY OF FINANCIAL REPORTING FOR PRIVATE COMPANIES

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Abstract: This research aims to demonstrate the importance of financial reporting systems in providing information relevant to economic activity and to highlight the role of modern technologies, particularly the Internet of Things (IoT). It also examines the impact of IoT technology on improving and developing financial reporting systems in Iraq. Given the potential contribution of IoT to the Iraqi economy, the study explores ways of promoting its adoption in private companies and examines the extent to which company management can benefit from this technology.

The researcher used an inductive approach to review and analyze studies related to corporate financial reporting and the use of the Internet of Things, and a deductive approach based on a field survey of financial managers, information technology managers, and specialists in financial reporting in Iraqi private companies. The questionnaire achieved a response rate of 84%, and the resulting data were used to test the research hypothesis and present the findings.

The researcher concluded that IoT technology can enhance the efficiency and effectiveness of accounting information systems by monitoring, measuring, and recording transactions and by facilitating the preparation of periodic financial reports through digital platforms. Furthermore, the

study found a statistically significant relationship between the application of IoT technology and the efficiency and transparency of financial reporting in private companies.

Keywords: Internet of Things (IoT), efficiency, financial reporting, private companies, international standards.

ЗНАЧЕНИЕ ИНТЕРНЕТА ВЕЩЕЙ (IoT) В ПОВЫШЕНИИ ЭФФЕКТИВНОСТИ ФИНАНСОВОЙ ОТЧЁТНОСТИ ЧАСТНЫХ КОМПАНИЙ

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Аннотация: Данное исследование направлено на демонстрацию важности систем финансовой отчётности в предоставлении информации, значимой для экономической жизни, а также на освещение роли и значения современных технологий, в частности Интернета вещей (IoT). Кроме того, исследование направлено на формулирование вывода относительно влияния технологии IoT на улучшение и развитие систем финансовой отчётности в Ираке. Учитывая важность данной роли, а также необходимость поиска путей и средств, способствующих активизации применения технологий в частных компаниях, рассматривая их как важную поддержку иракской экономики,

исследование также оценивает степень, в которой руководство этих компаний может извлечь из них пользу, включая их применение.

Исследователь использовал индуктивный метод для представления и анализа исследований, связанных с финансовыми отчётами компаний и использованием Интернета вещей, а также дедуктивный метод посредством полевого опроса представителей финансового менеджмента и управления информационными технологиями в частных компаниях, а также специалистов в области подготовки финансовой отчётности. Уровень отклика составил 84%, что позволило проверить гипотезы и представить результаты.

Исследователь пришёл к выводу, что технология Интернета вещей (IoT) эффективно способствует повышению эффективности и результативности функций бухгалтерской системы посредством мониторинга, измерения и регистрации всех операций, а также предоставления периодических финансовых отчётов по ним через веб-сайты и цифровые платформы. Кроме того, была выявлена статистически значимая связь между применением технологии IoT и повышением эффективности и прозрачности финансовых отчётов в частных компаниях.

Ключевые слова: Интернет вещей (IoT), эффективность, финансовая отчётность, частные компании, международные стандарты.

Introduction

Contemporary accounting is facing rapidly evolving technological challenges associated with the Fourth Industrial Revolution. Traditional accounting information systems alone are increasingly insufficient to meet the needs of financial statement users in a dynamic and complex environment. Within this digital transformation, the Internet of Things (IoT) has emerged as an important technological development. By connecting physical assets and operational processes and enabling data to flow automatically to accounting systems, IoT applications can enhance the efficiency and effectiveness of accounting functions through the monitoring, measurement, and recording of economic, environmental, and social transactions, as well as the preparation and delivery of periodic reports through digital platforms.

The Internet of Things (IoT) philosophy in the organizational environment is based on connecting physical devices and equipment to a digital network that enables data exchange without human intervention, creating an integrated information environment that merges operational and financial aspects. This technological integration primarily aims to address the shortcomings of traditional accounting models that rely on historical and periodic data, and to shift towards a "continuous accounting" model. This ensures the flow of high-quality financial information at a lower time cost. The importance of studying the impact of the Internet of Things on financial reporting is highlighted through two main axes: the first relates to the quality of accounting information; this technology contributes to enhancing the characteristics of relevance and honest representation by reducing human error and providing accurate measurements of inventory, production costs, and depreciation of fixed assets based on actual use rather than time estimates. The second relates to the efficiency of financial reports and their ability to support decision-making; real-time monitoring allows management and investors to access timely performance indicators that reflect the company's actual financial condition at a given time, thereby reducing the information gap between stakeholders.

However, adopting IoT in financial reporting raises important questions concerning data security, privacy, and the ability of existing accounting standards to accommodate the large volume and variety of data generated by connected devices. Accordingly, this research explores the relationship between the use of IoT technologies and the efficiency of financial reporting, with particular attention to their potential role in improving financial transparency and confidence in accounting information. The research problem therefore concerns how IoT can be implemented, the challenges associated with its adoption, and its potential relationship with the efficiency of financial reporting. The study aims to determine the extent to which IoT technology affects the efficiency and quality of financial reporting in Iraqi private companies and to assess its potential contribution to the national economy.

Research hypothesis: The study is based on the following hypothesis: IoT technology has a statistically significant effect on the efficiency of financial reporting in private companies.

The theoretical background of the research:

Internet of Things (IoT)

The Internet of Things (IoT) is one of the most prominent technological transformations in the digital age. It refers to an interconnected network of physical devices equipped with sensors and software that enable them to collect, exchange, and analyze data over the internet without direct

human intervention [1]. The core idea is to transform traditional objects (industrial equipment, meters, vehicles, and machines) into smart companies capable of communicating, interacting and making semi-autonomous decisions based on the data flowing to them, and thus the role of the information system information system can move beyond merely recording events toward managing operations in a real-time and continuous manner [2].

The Internet connects people through social and commercial networks and through systems that facilitate business transactions, such as online banking and e-commerce [3]. In contrast, the Internet of Things connects machines and systems through sensors and actuators, enabling them to collect useful information and perform actions that can improve productivity and efficiency. IoT therefore extends the concept of connectivity beyond people to physical objects and operational systems. The technology has the potential to reduce waste, costs, and inconvenience while improving efficiency and the quality of services [4].

Objectives of the Internet of Things (IoT):

The objectives of the Internet of Things (IoT) are to integrate the physical and digital worlds in order to improve operational efficiency and information quality. A primary objective is to reduce operating costs through continuous process monitoring and the early detection of errors or deviations, thereby enabling rapid corrective action. IoT can also improve productivity by optimizing resource use and reducing waste and losses [5]. In accounting and finance, IoT can improve the accuracy and timeliness of accounting measurements by automating transaction recording and reducing the risk of human error. It can also provide real-time information to support decision-makers in assessing financial and operational performance [6].

In the Iraqi context, these objectives can contribute to supporting administrative and financial reform plans, especially given the need to improve transparency and oversight. Linking production systems to accounting enables the tax administration to access more accurate information about the volume of economic activity. Furthermore, IoT can support broader digital transformation by generating large datasets that can be analyzed using data analytics and artificial intelligence. This may improve market efficiency and reduce information gaps among stakeholders. Therefore, the objectives of IoT extend beyond process improvement to include strengthening trust in the wider economic environment [7].

Benefits of the Internet of Things: It offers many benefits, including: [8]

- Using smart technology in homes and offices can lead to reduced energy expenses, alter the interiors of buildings as per requirements of residents, offer safe

security by way of consistent monitoring, and use proactive means such as informing the police authorities in case of a security risk.

- Remote patients and use of technology to provide better healthcare services.
- Reiteration of some assignments like the payment of utility bills and parking payment.
- Establishment of automatic streetlights and signals.
- Remote monitoring of production site can ensure improved productivity, dependability, and safety in manufacturing.
- Smart vehicles that can notify about potential troubles while also regulating the speed of the car as per environmental conditions.

These statistics illustrate the growth of the IoT market. The global private-market segment was valued at US\$17.85 billion in 2018 and was projected to reach US\$116.27 billion by 2026, representing growth of 26.5% during the forecast period. The Asia-Pacific region accounted for an 18.77% share of the global market in 2018. The increasing use of cloud-based IoT platforms is expected to accelerate IoT adoption across many financial sectors [9].

The Internet of Things consists of financial companies. In this case, it indicates the network of smart connected devices, including phones, household helpers, and pay systems, among others. These smart devices ensure improved payment and banking service provided to customers. The devices have efficient sensors integrated with the Internet infrastructure. The Internet connection is responsible for sending/receiving messages from these devices to each other through one platform.

Moreover, IoT solutions include hardware and software components that facilitate the transmission and receipt of relevant data between financial institutions and customers. These solutions can be used to understand customer demand, analyze customer behavior, and provide real-time analytics related to services such as credit and lending [10].

In banking, financial service providers can use IoT solutions to improve service availability and operational efficiency. For example, banks can monitor ATM usage in different locations and use this information to support decisions about whether to install, relocate, or remove ATMs. Non-bank financial companies (NBFCs) may also use IoT solutions to reduce operating costs [11].

Limitations of Internet of Things (IoT) Use:

Despite these benefits, the use of IoT also raises concerns about security and privacy. Smart meters, for example, can track the presence or absence of people in a home and can automatically control energy-consuming devices [12]. If such information falls into unauthorized hands, however, it may create significant security risks. Monitoring patients or older adults may also raise privacy concerns. More broadly, IoT can have unintended social consequences and may affect people's behavior. Questions therefore remain regarding what data are collected, who can access them, and how they are used.

Concerns about privacy are not unique to IoT or other emerging technologies. Similar concerns have accompanied the introduction of new digital technologies, including email and cloud computing. How companies and organizations that provide IoT technologies address privacy and security concerns will significantly influence the outcomes of their adoption.

Components of the Internet of Things

An IoT system consists of interconnected components that work together to achieve specific objectives. The first component comprises smart devices and sensors, which collect data from the surrounding environment, including financial, production, and environmental data. These sensors initiate the information cycle and are essential for obtaining data that accurately reflects real-world conditions. The second component comprises communication networks, which transmit data from connected devices to processing centers. These networks include the Internet, wireless networks, and other modern communication technologies. In Iraq, developing communications infrastructure is an important condition for successful IoT implementation, as unreliable connectivity can hinder the effective transmission of data [15].

The third component consists of data-processing and analytics platforms, where raw data are transformed into useful information. Big data analytics can be used to derive financial indicators that support financial reporting. Finally, application systems present the results to decision-makers and support appropriate action. In accounting, these applications can be integrated directly with accounting information systems to facilitate automated reporting [16]. Through the integration of these components, IoT can become a strategic tool for improving the efficiency and transparency of financial reporting in Iraq.

The Concept of Financial Reporting:

Financial reports are defined as the final output of an accounting information system, and they aim to communicate the results of accounting measurements to stakeholders in a clear and organized manner. They do not simply present figures, but

also include interpretation and analysis that help users understand the financial position and economic performance of the entity. In the Iraqi context, financial reports are of particular importance due to the reliance of tax authorities and investors on them for decision-making. However, challenges facing the accounting system, such as weak disclosure or delays in reporting, affect the quality of available information [17].

Financial reporting is viewed as a means of achieving transparency and accountability, enabling external parties to assess management's efficiency in resource utilization. It also serves as a tool for measuring compliance with laws and regulations, including tax laws. Therefore, developing a financial reporting system in Iraq requires improving data quality and accuracy, which can be achieved through the integration of modern technologies such as the Internet of Things [18].

From the foregoing, financial reporting can be understood as more than the disclosure of financial statements. It also encompasses related disclosures, mechanisms for verifying the accuracy of reported information, and the provision of information that helps users make decisions. Accordingly, financial reporting is an important part of the broader organizational environment and is closely linked to the culture and ethical practices within it [19].

On the other hand, some believe that the task of financial accounting does not stop at producing accounting information, but rather it must deliver this information to the beneficiaries in a way that makes it easier for them to understand it, because it is not expected that all of those parties will have knowledge of accounting rules and terminology. This additional task of financial accounting is what is called financial reporting. The researcher believes that financial reporting refers to accounting for the financial performance of economic units, especially companies, and the process of delivering it to the parties interested in the performance evaluation process, assuming that the information recorded in the report is for making decisions related to investment, borrowing, or acquisition to provide financial assistance. It also relates to the amount of taxes due on those economic units [20]. Reporting is not an end in itself, but rather a means of delivering data and information related directly or

indirectly to the outputs of the accounting system. This gives the dynamic (non-stability) character to the objectives sought from financial reporting.

Financial reports are an important source of information for investors, creditors, and regulatory bodies when making decisions. They support assessments of profitability, liquidity, and solvency and can help users estimate future cash flows. In Iraq, financial reports are also important for determining the tax base because tax authorities rely on reported information when assessing taxable income. Consequently, weaknesses in the accuracy or transparency of financial reports may result in inaccurate or unfair assessments [21].

Financial reports also contribute to building trust between organizations and their stakeholders by demonstrating compliance with applicable accounting standards. Improving reporting quality through advanced digital systems may reduce opportunities for fraud and manipulation and may enhance the credibility of financial information in the Iraqi market.

Types of Financial Reports: International Accounting Standard (IAS) 1 specifies presentation requirements for financial statements and the information that should be included. The study identifies the following statements and disclosures [22]:

- Statement of Business Results (Income Statement), sometimes called the Profit and Loss Statement, shows the result of the company's business at the end of the fiscal year, whether it is a profit or a loss, according to generally accepted accounting principles and according to the accrual basis and matching the revenues of the financial period with its expenses.

- The statement of profit and loss distribution: Sometimes called the statement of retained earnings, it is considered an appendix to the income statement. The purpose of preparing it is to show how profits and losses are distributed, and to show that part of them that has not been distributed, which is called retained earnings, or carried forward to the next year.

- Statement of Financial Position (Balance Sheet). This includes the classification of assets and liabilities: the company must present a detailed classification of the balance sheet based on current and non-current assets and liabilities. If presenting the balance sheet based on the degree of liquidity of assets and liabilities provides more relevant and reliable information, the current and non-

current categories can be omitted. In all cases, the company must separate items expected to be recovered within (12) months or paid after (12) months. This list shows the company's assets and liabilities at a specific point in time, which is the end of the financial year, and it must be balanced by applying the balance sheet equation: $\text{Assets} = \text{Liabilities}$ or $\text{Assets} = \text{Liabilities and Equity}$.

- Statement of Changes in Financial Position: Sometimes called the statement of sources and uses of funds, it shows all the changes that have occurred to the elements of the financial position, whether increases or decreases. These changes are classified into sources of funds and their uses. This classification may be according to the effect of these changes on net working capital (the difference between current assets and current liabilities), and it must also be balanced [23].

- Notes: The notes should disclose the basis for the preparation of the financial statements, significant accounting policies, information required by International Financial Reporting Standards (IFRS) but not disclosed in the statements themselves, and additional information contained in the statements but required for further understanding. Notes should be presented regularly, and a reference should be made to the relevant note for each item in the statements.

The Impact of the Internet of Things on the Efficiency of Financial Reporting in the Iraqi Environment:

Implementing the Internet of Things (IoT) improves the efficiency of financial reporting by recording transactions instantly and reducing reliance on manual data entry. This minimizes errors and enhances data reliability. It also helps reduce information asymmetry, as different parties can access up-to-date and accurate data simultaneously. In Iraq, where institutions are striving to enhance transparency, this aspect is a crucial factor in building trust [24].

IoT can also support internal control systems through continuous monitoring of operational processes, potentially reducing opportunities for manipulation and fraud. Linking operational activities with accounting systems may improve the accuracy and timeliness of information used for tax assessment. Therefore, integrating IoT into the Iraqi business environment may contribute not

only to technological improvement but also to institutional development, greater tax-system efficiency, and broader digital transformation [25].

The practical aspect of the study:

Population and Sample: The study population comprised individuals working in the technology sector and in financial reporting within Iraqi private companies. A total of 178 questionnaires were distributed, of which 150 were completed and returned, yielding a response rate of 84%.

Sample Characteristics: Table 1 presents the characteristics of the research sample.

Table (1) Properties of the research sample

Characteristics	Numerical	%
Gender		
Male	66	44%
Female	84	56%
Experience		
Under 5	23	16%
5–10	44	29%
11–25	62	41%
Over 25	21	14%
Education		
Bachelor's	111	74%
Diploma	18	12%
Master's	16	11%
PhD	5	3%

- **Gender:** The results of the study indicate that the number of males was (66), which is 44% of the study sample, and the number of females was (84), which is 56% of females, which indicates that most of the employees in companies represented by banks are females.

- **Number of years of experience:** Regarding the number of years of experience, 41% of the study sample have 11–25 years of experience, and the lowest percentage, 14% of the study sample, has more than 25 years of experience. This indicates that experienced individuals are relied upon to perform duties in order to avoid any errors.

- **Educational attainment:** Those with a bachelor's degree constituted 74% of the study sample, representing the highest percentage, followed in second place by

those with a diploma and a master's degree at 12% and 11%, respectively, and then a doctorate at 3%.

This can be represented as follows:

Figure 2: Description of the study sample

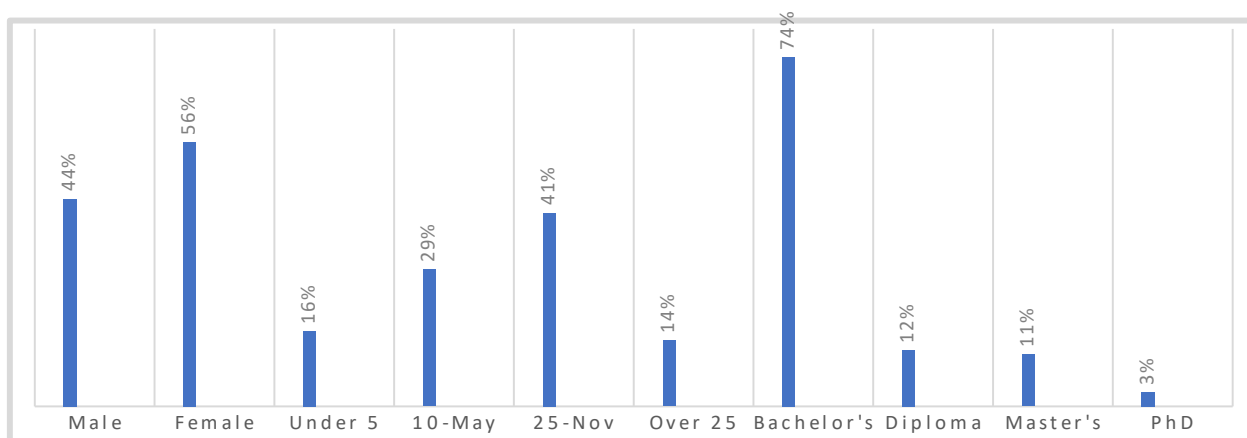


Table 2 presents the extent to which company management is interested in adopting Internet of Things (IoT) technology, based on respondents' answers to the questionnaire items.

Table 2: Analyzing the Results of the Importance of the Internet of Things

Number	Paragraph	Arithmetic Mean	Standard Deviation
1	The need for technology stems from the fact that the current systems and regulations prevailing in the company do not help to streamline performance and control its movement.	3.50	0.820
2	Adopting Internet of Things technology in all aspects of the work, where the company's management is keen to provide information and knowledge to stakeholders.	4.13	1.074
3	The company's current traditional systems do not help achieve speed of completion and economic performance.	4.00	0.695
4	The company's management sets expectations for changes in automation and the adoption of new technologies, including the Internet of Things.	3.80	0.925
5	Company management allocates a sufficient balance for research and development activities and the use of technology.	3.43	0.890
6	The company's management places great importance on research and development and the use of technology in order to design and develop its processes, products, and services to meet customer expectations.	4.07	0.907
7	The company's management is keen to identify the training needs of employees by relying on modern scientific methods of the Internet of Things.	3.73	1.015

Number	Paragraph	Arithmetic Mean	Standard Deviation
8	The company's organizational structure allows for a rapid response to changes in different circumstances, reflecting its high flexibility due to the availability of a specialized technology department.	4.10	0.607

The table shows that Item 2, concerning the adoption of IoT technology across all aspects of work and the provision of information and knowledge to stakeholders, received the highest mean score (4.13) with a standard deviation of 1.07. This suggests a relatively high level of interest in adopting IoT technology and automating work processes. By contrast, Item 5, concerning the allocation of an adequate budget for research and development and technology, received the lowest mean score (3.43) with a standard deviation of 0.89. This suggests that greater attention may be needed for technological investment and support.

Table 3 presents respondents' assessments of the relationship between IoT technology and financial reporting based on their responses to the relevant questionnaire items.

Table 3: The Relationship of Influence Between Variables

Arithmetic Mean	Standard Deviation	Paragraph	Number
4.23	0.679	Financial reports accurately reflect a company's results, operations, financial capabilities, and creditworthiness.	9
4.13	0.629	The financial report based on Internet of Things technology includes an explanation of the activity map that the company follows and an explanation of each step it takes.	10
4.37	0.809	Internet of Things (IoT) technology helps sustain financial reporting and create competitive value for the company through financial reports prepared accordingly.	11
4.43	0.626	Internet of Things (IoT) technology contributes to the analysis, presentation, and display of data and information in financial reports in a manner convenient for users.	12
4.37	0.809	Companies place paramount importance on the quality and efficiency of financial reporting in order to achieve competitiveness by adopting Internet of Things technology.	13
4.13	0.730	Private companies are interested in developing detailed policies that serve to improve the efficiency of financial reporting as a source of essential information for them.	14
3.37	0.159	Modern technology is influencing changes in the structure of financial reports.	15

The results in Table 3 indicate that Item 12, stating that IoT technology contributes to the analysis and presentation of financial-reporting data in a user-friendly manner, received the highest

mean score (4.43) with a standard deviation of 0.626. This finding highlights respondents' strong assessment of the role of IoT in presenting financial information. Item 15, concerning the effect of modern technology on the structure of financial reports, received the lowest mean score (3.37) with a standard deviation of 0.159. This suggests that respondents perceive the primary effect of technology to be on reporting efficiency rather than on the structure of the reports.

3.4 Corrected Hypothesis Testing (ANOVA)

To test the research hypothesis, a simple linear regression analysis was conducted. Based on the sample size ($N = 150$), the degrees of freedom (df) for the regression model are $k = 1$, for the residual $N - k - 1 = 148$, and total $N - 1 = 149$. The recalculated ANOVA results are presented below:

Table 4: Corrected Hypothesis Testing (ANOVA Table, $N = 150$)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	4.223	1			
Residual	19.165	148	4.223	32.610	0.000
Total	23.388	149	0.1295		

The statistical test yields an F-statistic of 32.610 with a significance level of $p = 0.000$ ($p < 0.05$). Consequently, the null hypothesis is rejected and the main research hypothesis is supported: *IoT technology has a statistically significant positive effect on the efficiency of financial reporting in private financial and banking institutions in Iraq.*

Conclusion

The Internet of Things (IoT) offers a range of potential benefits, including improved customer services, enhanced security, streamlined processes, and data-driven decision-making. As IoT technology continues to develop, its use may increasingly influence financial services by supporting innovation and operational efficiency. For financial institutions, appropriate adoption of IoT can therefore contribute to competitiveness and the ability to respond to changing customer needs in the digital age.

Financial reports also play a vital role in defining and shaping a company's financial policy. Furthermore, financial reporting, as represented by financial reports,

has significantly contributed to the development of accounting by raising companies' awareness of the importance of using the Internet of Things (IoT) through organized training courses. The training explains the requirements and how to use such a mechanism to improve the quality of financial reports and to strengthen investor confidence in it, thereby increasing investment opportunities, especially in a technological environment, as it is witnessing information changes that have led to the emergence of many electronic applications. Business management should give the use of the Internet of Things (IoT) the attention and importance it deserves. This mechanism improves the efficiency of financial reporting, thereby reducing the level of accounting information asymmetry, and this is what the research hypothesis proved.

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