World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 48, July, 2025
ISSN: 2749-3628,

ENHANCING FINANCIAL STATEMENT UNDERSTANDING USING ARTIFICIAL INTELLIGENCE APPLICATIONS (CHATGPT)

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Article history:

Received: 6th June 2025
Accepted: 4th July 2025

Abstract:

This research aims to explore the role of artificial intelligence, specifically the ChatGPT model, in enhancing the understanding and analysis of financial statements using innovative and advanced methods. It highlights how this technology can be utilized to analyze financial data and extract strategic insights that contribute to enhancing the quality of financial and administrative decisions.

The research relies on an in-depth analytical methodology that combines theoretical studies and practical applications of the use of artificial intelligence tools in processing financial statements. The results showed that the use of artificial intelligence significantly contributes to improving the accuracy of financial analysis, accelerating processes, and revealing financial patterns and trends that may not be apparent using traditional methods.

It also enhances organizations' ability to predict financial performance and plan strategically more efficiently. The research recommends investing in the development and adoption of artificial intelligence technologies in financial analysis and raising awareness among institutions and academic institutions of their importance and pivotal role in achieving transparency, reducing human error, and enhancing the efficiency of financial resource management.

Keywords: Financial statements, artificial intelligence, financial forecast, decision making, efficiency.

INTRODUCTION

Financial statements are one of the primary sources of information used by various organizations and external users (investors, creditors, and auditors) to analyze financial performance and make important decisions. Despite the simplicity of audit procedures for preparing these reports, auditors—especially given the complex nature of business processes and models—find it difficult to identify the quantitative and qualitative indicators that truly impact financial soundness and profitability.

Thanks to recent technological advancements, artificial intelligence (AI) has become a promising tool for improving the accuracy of financial statement analysis. Technologies such as machine learning and deep learning enable the identification of hidden patterns, identification of risks, and classification of situations based on key performance indicators (KPIs), rather than relying solely on traditional manual methods. Natural language processing (NLP) helps extract the best information from data and results for reporting purposes, increasing reliability and enhancing comprehension.

This study aims to evaluate the most common AI products used in financial reporting analysis, assess their effectiveness in improving the quality of financial decisions made by stakeholders, identify the technical and legal challenges associated with the application of this technology, and provide recommendations for improving the integration of mathematical knowledge and digital technologies. Through this research, we hope to highlight the powerful capabilities

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that intelligent tools offer to support more informed and accurate decision-making and provide a framework to help organizations build new and accurate investment analysis systems.

First: The Research Problem

The problem under study is the obsolescence of the methods and techniques currently used to conduct financial analysis of published accounting data, and their declining role in measuring and evaluating the performance of commercial companies operating in the local environment, revealing the true nature of their financial situations, and their usefulness in making sound investment and credit decisions. Financial statements without an analysis of the meaning of the numbers they contain may be difficult to utilize, given the difficulty of understanding the news content of the facts contained in these statements. Consequently, it is difficult to obtain indicators to identify the strengths and weaknesses in the performance and future of these companies.

Second: Research Objectives

The research aims to identify the potential of leveraging modern artificial intelligence applications to support and enhance the effectiveness of financial statement analysis processes. It also aims to draw the attention of commercial companies operating in the local environment to this new type of knowledge and provide them with the opportunity to experience its results. This will enable us to verify its feasibility. Consequently, we will focus on highlighting the importance of such modern applications as reliable tools that can be used in several fields, and the exciting implications and repercussions that result from them in improving decision-making processes, tightening control, and evaluating performance in commercial companies.

Third: The importance of this research

The importance of this research lies in the fact that artificial intelligence is linked to financial transactions, which in turn are positively linked to financial performance. Given the size and complexity of the financial sector, it is essential to have tools and processes to manage this data effectively. Artificial intelligence has proven its ability to predict future events and monitor changes and imbalances in financial transactions. This study highlights the importance of using technology to improve financial reporting for financial professionals. It also enhances technical and financial awareness, reduces costs and time, and improves project quality.

Fourth: Research Hypothesis:

To achieve the research objectives, the following main hypothesis will be tested: (Most managements of commercial companies operating in the local environment currently show no interest in modern applications of artificial intelligence and financial statement analysis processes, nor in utilizing their results to improve decision-making processes, strengthen control, and evaluate performance.)

Section One
Theoretical Framework

First: The Concept of Artificial Intelligence

Artificial intelligence is defined as the ability of computer systems to perform tasks that require human intelligence, such as learning from experience, recognizing patterns, and making intelligent decisions. Artificial intelligence can be divided into several categories, including weak artificial intelligence, strong artificial intelligence, machine learning, and artificial neural networks. Accounting information is considered one of the fundamentals that support sound financial and economic decision-making processes within institutions and companies.

Second: The Goals of Artificial Intelligence (https://bakkah.com/ar)

The ultimate goal of AI is to simulate human interaction with machines, allowing them to perform complex tasks and make autonomous decisions. The principles of AI applications can be summarized as follows:

1- Problem Solving and Decision Making: AI creates systems capable of analyzing massive data sets and making decisions, enabling problem-solving in various industries.

2- Enhancing Creativity and Innovation: Many AI-powered tools have the potential to stimulate creativity and innovation in writers, artists, and designers, beyond the limits of human imagination.

3- Planning: Planning is one of the most important aspects of AI applications. Programming helps AI systems define goals to achieve their objectives, goals that enable humans to anticipate the future.

4- Social Intelligence and Computation: Through social intelligence and computation, a system understands how to respond to social behaviors and situations that mimic human behavior. The system is also programmed with psychological and cognitive behavior to achieve this goal.

5- Knowledge Engineering: An AI system obtains the information it needs to solve a problem through AI, which understands the system's purpose and goal.

Third: AI can make a significant contribution to improving the usefulness of accounting information through (Al-Jaber, 2020, 24):

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1. Improving the accuracy of financial forecasts: AI models can predict companies' future financial behavior based on current and historical financial data, which aids in making strategic financial decisions.
2. Analyzing larger and more complex data: AI can process massive amounts of data quickly and efficiently, enabling it to detect patterns and trends that may not be apparent to traditional financial analysts.
3. Data Collection and Processing

Artificial intelligence (AI) is revolutionizing the field of financial analysis, enabling analysts to analyze data more accurately and quickly than ever before. Financial analysis relies on processing massive amounts of financial data, and this is where AI comes in to analyze this data in an efficient and accurate manner (Hasan, 2021: 453).

4. Financial Data Collection

Artificial intelligence (AI) is revolutionizing financial data collection, representing a radical shift in how data is collected and used in the financial sector. AI improves data collection processes by leveraging a wide range of sources, including historical financial data, social media tweets, news, company reports, and more (Kang et al., 2020:1).

For example, AI can analyze companies' financial data and uncover hidden relationships between different variables, helping to make smarter investment decisions. AI can also be used to identify weaknesses in companies' performance and anticipate potential financial crises.

5. Data Filtering and Preparation

Financial data filtering using AI can help analyze data efficiently and provide accurate insights into financial performance and future trends. AI techniques such as machine learning and big data analytics can be used to filter and organize financial data more accurately and quickly than humans can (Al-Jaber, 2020, 24).

6. Data Integration and Transformation

AI-derived financial data integration helps analyze financial data efficiently and quickly, facilitating data-driven financial decision-making. This integration can involve combining data from multiple sources, such as bank accounts, invoices, financial reports, and others, and converting it into an analyzable and usable format (Reisenhofer, 2021:19).

7. AI Techniques for Financial Analysis

There are several AI techniques used in financial analysis, including:

1. Machine Learning: Used to analyze financial data and predict market trends.
2. Artificial Neural Networks: Used to detect complex patterns in financial data.
3. Natural Language Processing: Used to analyze financial reports and extract key information.
4. Classification and Clustering Techniques: Used to classify financial assets and risks.

7. Natural Language Processing (NLP)

Natural Language Processing (NLP) is a branch of artificial intelligence that focuses on how computers interact with human language in a natural way. NLP includes text analysis, machine translation, information extraction, text synthesis, speech recognition, and human-machine interaction (Hasan, 2021: 453).

Fourth: Financial analysis of financial statements and artificial intelligence

Financial analysis actually reflects the continuous evaluation process of the performance of companies, projects, and other related financial entities to determine a better understanding of their financial performance results and the extent to which their results meet established objectives. Financial analysis is typically conducted by examining the evolution of the interconnected relationships between the elements of financial statements. The latter are typically the result of processing the content of accounting records, which provide a detailed and concise history of a company's performance, such as the size and nature of revenue sources, expenditures, expenses, profits, and losses at a given point in time. This information is very useful for comparison with previous data for the same entity or with similar information from similar economic entities (Naqvi, 2020, l).

Fifth: An Overview of Financial Analysis

Preparing the final accounts is not the final step in determining the results of the company's activities and financial position. Such final statements contain many numbers and data that may be incomprehensible to some, especially those unfamiliar with accounting data, such as internal decision-makers within the organization, and external or investment-related decision-makers. Here comes the role of financial analysis in detailing many aspects related to identifying the level of establishments, present and future, through analyzing the data of published financial statements (Qamura and others, 2018, 1:).

Researchers believe that financial analysis is not a simple or easy task that anyone can perform. It requires some knowledge of accounting data and statements. Behind this lengthy and meticulous process lie many objectives that may take time to achieve, such as for companies or accountants to organize these statements and then present them to financial analysts.

Sixth: The Importance of Using Artificial Intelligence Applications in Financial Analysis

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The modern world is witnessing a growing trend toward intelligent digital transformation. This is a world where information is of utmost importance. It is a world where professionals will give anything just to gain additional insight compared to competitors. International commercial organizations have begun to realize the potential of using this information to support their strategies in various areas, one of which is the process of knowledge discovery, often conducted in the form of exploratory data analysis and the extraction of more useful information (Reisenhofer, 2021:19).

Section Two: The Practical Framework

First: The Research Sample and Community: The researcher divided the research community into two categories to serve the purpose of the research. (110) questionnaires were distributed to the research sample, and (102) of them were returned, representing (95.1%) of which were suitable for analysis. The remaining (8) questionnaires were unsuitable for analysis, representing 4.9%. The research sample categories are as follows:

1 - The first category: Auditors: This category includes licensed auditors who work as auditors in the Iraqi financial market. Their number reached 50 certified auditors who audit the accounts of companies operating in Iraq. (46) questionnaires were returned, representing 89.8%. The remaining (8) questionnaires, representing 10.2%, were unsuitable for statistical analysis.

2 - The second category is accountants working in various governmental and private places: The number of questionnaires distributed to auditors reached (60) and (56) were returned, representing (94.1%). As for the remaining questionnaires, which numbered 4, i.e., 5.9%, they are not suitable for statistical analysis.

Table 1 above shows that the value of the KMO scale was recorded for both understanding financial statements 0.457 and artificial intelligence applications 0.672. After ensuring that the sample size is sufficient to apply confirmatory factor analysis, the availability of the second condition that must be present in the research data before applying the confirmatory factor analysis method should be verified, which stipulates the necessity of the presence of significant correlations between the items within (understanding financial statements and artificial intelligence applications), starting from the application of the (Bartlett Test) method.

Table 1: KMO test results

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Vol. 48, July, 2025
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Variables	KMO Scale Value	Interpretation
Understanding Financial Statements	0.457	. All scale values were above 0.600, confirming the possibility of applying the confirmatory factor analysis method to the data obtained from the responses of the studied sample with high efficiency.
Artificial Intelligence Applications	0.672	

KMO: Abbreviation for the Kaiser-Meyer-Olkin Measure

Table 2: Level of answers of the studied sample to the questionnaire paragraphs

symbol	Paragraphs	Weighted Mean	Response Trend	Response Level	Standard Deviation	Relative Importance, %	Coefficient of Variation %
q01	Artificial intelligence contributes to improving the utilization of accounting information published in financial statements and statements.	4.677	Agreement	High	1.343	73.53%	36.55%
q02	Artificial intelligence models can predict the future financial behavior of companies based on current and historical financial data.	3.755	Agreement	High	1.124	81.57%	27.53%
q03	The use of artificial intelligence in accounting systems leads to the availability of sufficiently reliable financial statements.	3.53	Agreement	High	1.336	75.29%	35.50%
q04	Artificial intelligence can process large	3.951	Agreement	High	1.412	68.82%	45.01%

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	amounts of data, which aids in making strategic financial decisions.						
q05	Artificial intelligence contributes to discovering patterns and trends that may not be apparent to traditional financial analysts.	4.439	Agreement	High	0.801	79.02%	15.27%
q06	Artificial intelligence applications contribute to their ability to reduce the workload on accountants and improving existing processes.	4.431	Agreement	High	1.392	72.35%	35.52%
q07	Artificial intelligence applications contribute to enhancing the understanding of financial statements in an effective manner.	3.216	Neutrality	Moderate	1.447	70.39%	41.11%
q08	Artificial intelligence contributes to financial analysis and improving market forecasts and investment guidance by analyzing historical data and predicting future trends.	4.735	Agreement	High	1.335	73.73%	41.21%

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q09	**Artificial intelligence can analyze companies' financial data and discover hidden relationships between different variables, helping make smarter investment decisions.**	**4.569**	**Agreement**	**High**	**1.352**	**73.33%**	**36.88%**
q10	**Artificial intelligence contributes to enhancing financial information.**	**3.873**	**Agreement**	**High**	**1.233**	**76.86%**	**32.08%**
X1	**The impact of artificial intelligence in enhancing the understanding of financial statements**	**4.561**	**Agreement**	**High**	**1.132**	**73.40%**	**44.91%**

Second: Descriptive analysis of the level of the sample's answers to the questionnaire paragraphs: It is concluded from Table 2 that the value of the weighted arithmetic mean for the variable reached 4.561, which is greater than the value of the hypothetical mean (3). The value of the weighted arithmetic mean for this variable was within the category between (3.4 to less than 4.2) in the gradations of the sample individuals' response strength matrix, to document that the level of the sample's answers to all the questionnaire paragraphs tended towards agreement at a high level and with a standard deviation of (1.132), and with a standard coefficient of variation whose value reached (44.91%), which shows the degree of homogeneity of the sample's answers regarding the questionnaire paragraphs. The relative importance of the questionnaire paragraphs constituted 73.40%, which clarifies the agreement of the research sample individuals that the accountants and auditors of the research sample are greatly interested in the necessity of employing artificial intelligence in the accounting and auditing specialization.

It is also concluded from Table (3) that the levels of importance of the paragraphs within the questionnaire variable were distributed between the lowest level of standard coefficient of variation recorded by paragraph (5), which amounted to (15.27%) among all the questionnaire paragraphs, which documents the existence of a higher homogeneity between the answers of the sample members regarding paragraph (5) among all the questionnaire paragraphs, and with a strong response to paragraph (4), which recorded (68.82%), which confirms the agreement of more than 4/3 of the research sample members that artificial intelligence contributes to financial analysis and improving market expectations and investment directions through analyzing historical data and predicting future trends.

Paragraph (3) recorded the highest standard deviation coefficient of difference (57.50%) among all questionnaire paragraphs, documenting the presence of less homogeneity among sample members' responses regarding paragraph (8). The response to paragraph (73.73%) confirmed that more than half of the sample members studied agreed that the use of artificial intelligence in accounting systems leads to the availability of sufficiently reliable financial statements.

Table 3: Results of testing the first main hypothesis

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Independent variable	Dependent variable	Correlation coefficient between two variables	Interpretation	Z-test Interpretation		Interpretation
Understanding financial statements	**Artificial intelligence applications**			**Calculated Z-value**	**Probability value**	
		0.676**	**There is a strong direct correlation between the two variables**	**7.479**	**0.00**	**Accepting the first main hypothesis**

****. Correlation is significant at the 0.01 level (2-tailed).**
***. Correlation is significant at the 0.05 level (2-tailed).**

Third: The impact of artificial intelligence on enhancing the understanding of financial statements

The research utilizes the F-TEST method to demonstrate the acceptance or rejection of the hypothesis of the impact of artificial intelligence on the understanding of financial statements. The impact hypothesis will be accepted when the probability value corresponding to the calculated F value is equal to or less than the significance level (0.05), thus documenting the acceptance of the hypothesis with a percentage (95% to 99%). Meanwhile, the impact hypothesis will be rejected when the probability value corresponding to the calculated F value is greater than the significance level (0.05), thus documenting the rejection of the hypothesis.

To diagnose the percentage of interpretation of artificial intelligence technology for the changes that occur in enhancing the understanding of financial statements, the researcher benefits from the coefficient of determination (explanation) %R2. In this stage of the analysis, the researcher will test the second main hypothesis, which states (there is a statistically significant moral effect in the impact of artificial intelligence in enhancing the understanding of financial statements.

Table (4) confirms the acceptance of the second main hypothesis with a confidence rate of (95% and up to 99%), as the calculated F value reached (212.3), which is significant, while the value of the coefficient of determination reached (65.1%), which indicates the percentage of interpretation of the impact of artificial intelligence for the changes that occur in enhancing the understanding of financial statements.

Table (4) Results of the statistical analysis to test the second main hypothesis

Independent variable	Dependent variable	Coefficient of Determination R^2 %	Interpretation	F Test		Interpretation
				Calculated F Value	**P-Value**	

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Artificial Intelligence	**Enhanced Understanding of Financial Statements**	**65.1%**	**Percentage of Artificial Intelligence Explanation of Changes in Financial Statement Enhancement**	**212.3**	**0.00**	**Acceptance of the Second Main Hypothesis**

The previous statistical analysis indicates a clear impact of artificial intelligence in enhancing the understanding of financial statements, confirming the potential for the use of artificial intelligence in the accounting and auditing profession, given its many positive outcomes in improving the quality of accounting work.

Section Three: Conclusions and Recommendations

Conclusions

1. There is a statistically significant effect of artificial intelligence in enhancing the understanding of financial statements.
2. There is a statistically significant correlation between enhancing the understanding of financial statements and the applications of artificial intelligence.
3. The relative importance of the questionnaire items resulted in an agreement (73.40%) among the research sample members that the accountants and auditors in the research sample are greatly interested in the necessity of employing artificial intelligence in the accounting and auditing profession.
4. The research sample agreed that artificial intelligence contributes to financial analysis and improving market forecasts and investment trends through analyzing historical data and predicting future trends.
5. The information generated by analyzing financial statements using artificial intelligence applications can help company management better predict the future by providing accurate, multiple, and timely financial indicators, which positively impacts the company's overall future financial performance.
6. Financial statements analyzed automatically using artificial intelligence techniques can provide useful, real-time information that contributes to assessing the efficiency of a commercial company's administrative and organizational performance by comparing its performance over several past periods, distributed according to departments, branches, cost centers, and responsibilities.
7. The use of automated financial analysis can provide shareholders and potential investors with relevant information about the company's level of resource management efficiency and help identify its strengths and weaknesses.

Based on the above findings, we offer the following recommendations:

1. Promote the use of AI technology in financial analysis. Provide advanced training for accountants and professionals on using AI to better analyze and understand financial reports.
2. Develop software specifically designed for financial data analysis. Create AI-based software that demonstrates correlations between financial trends and forecasts to facilitate decision-making.
3. Raise awareness of the importance of AI within organizations. Organize workshops and seminars on the importance of AI and its role in improving the accuracy of financial reporting and data analysis.
4. Use AI to create accurate financial performance indicators. Develop AI models to provide real-time financial metrics that help managers and regulators assess corporate profitability.
5. Create effective AI-powered financial reports. Provide companies with a reporting system that can compare actual performance with previous periods and provide specific recommendations for improvement.
6. Improve the technical infrastructure to support AI. Invest in advanced technological systems to support the automated and efficient collection and analysis of financial data.
7. Promote scientific research in the field of AI and accounting. Support collaborative research projects between universities and companies to explore the use of artificial intelligence in accounting and financial analysis.

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