



THE IMPACT OF ARTIFICIAL INTELLIGENCE ON IMPROVING THE QUALITY OF FINANCIAL DATA FOR PLANNING BUDGETS AND ENHANCING THE ROLE OF EXTERNAL CONTROL-AN APPLIED STUDY IN A COMMERCIAL BANK

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Article history:	Abstract:
Received: 20 th November 2025 Accepted: 14 th December 2025	The relationship between artificial intelligence and financial data quality used for planning budgets, and their role in enhancing the efficiency of external control of commercial banks, is presented in this study. This research assumes that technologies of artificial intelligence are modern tools representing a revolution in the banking work environment due to its contributions to data analysis, processing huge financial records, and presenting exact forecasts to let banks make more realistic and flexible budgets. The theoretical framework showed that artificial intelligence would enhance the capability of accuracy, speed, and reliability of financial data because of reliance on machine learning systems, deep learning, and big data processing. Field analysis in the commercial bank has shown that employees recognize the importance of these technologies in reducing errors, improving the quality of financial reports, and reflecting a positive attitude toward digital transformation.

Keywords: artificial intelligence, financial data, commercial banks

FIRST: INTRODUCTION

During the past two decades, the world witnessed a paradigm shift in financial and accounting work patterns due to the continued technological development that has afflicted most business activities, represented in the most important strategic resource of artificial intelligence for financial and administrative decision-making in institutions. Accordingly, it has become clear that artificial intelligence applications are among the cornerstones to achieve the efficiency and correctness of the financial analysis, which in turn has become directly related to improving the qualifications of financial information used in preparing planning budgets in order for them to be credible and trustworthy in front of supervisory authorities.

The planning of a budget is one of the most important administrative and financial practices that helps banking organizations make their future plans and channelize their resources towards fulfilling their strategic goals. But the efficiency of budget planning heavily relies on the quality of the financial information on which the budget planning process is based. Any inadequacy or imprecision in the financial information causes discrepancies in the budget and further hinders the financial planning by taking flawed decisions. This again highlights the critical significance of artificial intelligence for analyzing big data and getting improved information for the financial planners.

SECOND: RESEARCH PROBLEM

Financial data quality is one of the basic keystones in establishing precise planning budgets and sound financial decisions for banking institutions. Despite this, many banks, specifically in developing countries such as Iraq, encounter challenges regarding data inaccuracy, late updating, and low integration between accounting and banking processes, affecting data correctness and the efficiency of external control in judging objective financial performance accurately because of large discrepancies between planning goals and budget results (Al-Alwani, 2020; Al-Bazzaz, 2021).

Thus, in this context, the usage of artificial intelligence technologies has been identified as the most important innovation that can process a vast quantity of data in a quick and accurate manner to produce patterns that can aid in the planning process. Nonetheless, the usage of technological innovation in the Iraqi banking sector has been in its infancy stage; therefore, the need to investigate the influence of the usage of technological innovation on the quality of the financial data in the external control process was established (Al-Shammari, 2022; Kokina & Davenport, 2021).



THIRD: RESEARCH OBJECTIVES

The present study aims to explore the value of the use of artificial intelligence in the enhancement of the quality of the information used during the process of preparing the planning budgets, as well as the degree of the effect on the efficiency of the external controls in the bank.

FOURTH: RESEARCH HYPOTHESES

Main Hypothesis (H0):

There is no statistically significant effect of artificial intelligence on the quality of financial data used in planning budgets or on enhancing the role of external control.

Alternative Hypotheses (H1–H4):

H1: There is a statistically significant effect of using artificial intelligence technologies on improving the quality of financial data in the preparation of planning budgets in banks.

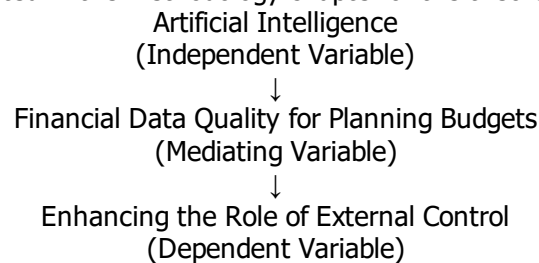
H2: There is a statistically significant effect of financial data quality on enhancing the role of external control in banks.

H3: There is a statistically significant direct effect of artificial intelligence technologies on enhancing the role of external control.

H4 (Mediation Hypothesis): Financial data quality plays a mediating role in the relationship between artificial intelligence and the enhancement of the role of external control.

Second: Research Model

The research model may be presented in the methodology chapter or the theoretical framework as follows:



With the presence of a direct effect of artificial intelligence on enhancing the role of external control.

Sixth: Operational Definitions of the Independent Variable

Artificial Intelligence

Artificial intelligence is measured by the extent to which the bank relies on intelligent technologies in collecting and analyzing financial data, forecasting budgets, and automating work procedures.

Financial Data Quality for Planning Budgets

Data quality in financial reporting is assessed in relation to the extent to which accuracy, transparency, completeness, relevancy, and time-relatedness of the budgeting data.

Improving the Role of External Control

The role played by external control is gauged through the effectiveness of external auditing, the quality of the reports they offer, the capacity to identify any deviations, and improve the degree of transparency through variables that.

PREVIOUS STUDIES

First: Studies on Artificial Intelligence in Financial and Accounting Operations

1. Chen & Li (2021)

Title: Artificial Intelligence Applications in Financial Data Processing in Commercial Banks

Methodology: Descriptive–Analytical

Sample: 150 employees in Chinese banks

Key Findings:

- Artificial intelligence contributed to accelerating data processing by 40%.
- Predictive algorithms improved the accuracy of financial forecasting and budget preparation.
- Intelligent systems reduced financial errors resulting from human intervention.

Relevance to the Current Study:

This study supports the research hypothesis that artificial intelligence contributes to improving the quality of financial data.

2. Ahmed (2022)

Title: The Role of AI in Budget Forecasting

Methodology: Experimental

Findings:

- Financial forecasting accuracy increased by 35% after the use of artificial intelligence technologies.



- Measurement of financial deviations between planned and actual budgets was improved.

Relevance to the Study:

This study supports the relationship between artificial intelligence and financial planning.

3. Al-Hassan (2021)

Title: Financial Data Quality and Its Role in Decision-Making within Banks

Findings:

- Higher data quality leads to more accurate managerial decisions.
- Modern information systems are a key factor in improving financial data quality.

Relevance:

The study strengthens the linkage between data quality and planning budgets.

4. Mohammed (2020)

Title: Problems of Budget Preparation and Their Relationship to Data Quality

Findings:

- Weak integration among departments negatively affects budget quality.
- Data quality explains 60% of the efficiency of budget preparation.

Relevance:

This study focuses on the direct relationship between financial data quality and budget effectiveness.

Third: Studies on External Control and the Role of Technology

5. Al-Sarraf (2022)

Title: The Role of Information Systems in Supporting External Control in Iraqi Banks

Findings:

- Digital systems contribute to increased transparency and reduced manipulation.
- They provide accurate data to external auditing bodies.

Relevance:

This study serves the third variable in the current research related to external control.

Theoretical Framework of the Study

First: Artificial Intelligence and Its Financial Role

1. Definition of Artificial Intelligence

Artificial intelligence is the ability of digital systems to simulate human behavior in thinking, learning, and decision-making, using algorithms capable of analyzing large volumes of data and extracting patterns from them.

2. Characteristics of Artificial Intelligence Relevant to Financial Data

1. High-speed data processing.
2. Continuous learning and performance improvement.
3. Ability to detect errors and anomalies.
4. Highly accurate predictive analysis.
5. Capability to handle big data.

3. Areas of Artificial Intelligence Application in the Banking Sector

1. Early detection of risks.
2. Accurate analysis of financial data.
3. Improvement of supervisory procedures.
4. Decision-making support.
5. Automation in report preparation.

Second: Financial Data Quality in Planning Budgets

1. Concept of Financial Data Quality

It refers to the extent to which financial data are relevant, accurate, comprehensive, and reliable in assisting management in making planning decisions.

2. Elements of Financial Data Quality

(Accuracy, Completeness, Relevance, Timeliness, Reliability and Understandability)

3. Importance of Data Quality in Planning Budgets

1. Improving financial forecasting.
2. Increasing the success rate of achieving objectives.
3. Reducing future deviations.
4. Supporting the efficiency of internal and external control.

Third: Planning Budgets and the Use of Artificial Intelligence in Their Preparation



1. Concept of Planning Budgets: A planning budget helps to determine the expected revenues, expenses, and future activities of an establishment within a given period of time.

2. Phases of Planning Budget Preparation:

(Data collection, Analyze and predict, Plan Formulation, Approval and Implementation and Monitoring and Control).

Chapter Four

The Role of Artificial Intelligence in Developing the Planning Budget

First: Core Concepts of Planning Budgets and Artificial Intelligence

I. Concept of the Planning Budget

The planning budget will be defined as a financial plan with a prospective outlook, outlining projected income and expenditure over a set period of time, with a goal of allocating funds to meet strategic plans (Al-Shammari, 2021). The planning budget is significant in control and appraisal.

2. Importance of the Planning Budget

(Improving the quality of financial decision-making, Supporting strategic planning, Enhancing performance control and Reducing financial waste)

3. Traditional Problems of the Planning Budget

(Reliance on outdated and inaccurate data, Lengthy budget preparation cycles, Weak financial forecasting, Subjective influences in financial estimates and Difficulty in integrating a large number of variables)

4. Concept of Artificial Intelligence

Artificial intelligence is defined as the ability of systems to learn, analyze, and make decisions based on data (Russell & Norvig, 2021).

Second: The Role of Artificial Intelligence in Developing the Stages of the Planning Budget

1. The Role of Artificial Intelligence in Data Collection and Quality Improvement

A. Automating Data Collection: Artificial intelligence combines data from various sources such as the accounts department, the sales team, and the human resource team. This not only saves time but also decreases errors (IBM, 2020).

B. Cleaning Financial Data: From various studies, it is confirmed that the machine learning algorithms are able to: (Detecting Errors, Correcting Outliers, Completing Missing Data and This significantly improves budget quality (Degi, 2022)

C. Continuous Updating: There is the real-time updating of data in intelligent systems, which enables the creation of budgets with realistic data.

2. The Role of Artificial Intelligence in Financial Analysis and Forecasting

A. Predictive Models

Artificial intelligence can aid in the creation of precise prediction models with the aid of: (Neural networks, Decision trees and Deep learning)

B. Scenario Analysis

Artificial intelligence makes it possible to prepare dozens of scenarios in just seconds, thus assisting the management in assessing the effects of changes to come (PwC, 2022).

C. Sensitivity Analysis

Techniques of artificial intelligence can also be used to measure the impact of changes in any of the input variables of a budget, like changes in interest rates or material prices (Warren & Moffitt, 2020).

D. Detecting Hidden Pattern

Big data analytics techniques uncover non-obvious relationships among financial variables, thereby enhancing the quality of assumptions (Brynjolfsson & McAfee, 2020).

3. The Role of Artificial Intelligence in Budget Preparation

A. Developing Dynamic Budgets

Artificial intelligence systems support the preparation of rolling budgets instead of traditional annual budgets (Deloitte, 2021).

B. Reducing Bias and Human Error

Research has shown that reliance on algorithms reduces subjective influences in financial estimates (Appelbaum & Vasarhelyi, 2019).

C. Improving the Quality of Assumptions

Artificial intelligence helps build more accurate assumptions regarding: (Growth, Demand, Costs and Inflation)

4. The Role of Artificial Intelligence in Budget Execution and Control

A. Real-Time Monitoring of Deviations



Intelligent systems demonstrate the ability to compare actual performance with planned figures instantaneously and identify deviations as soon as they occur (INTOSAI, 2019).

B. Early Warning Systems

Intelligent systems provide alerts in cases of: (Expenditure overruns, Revenue shortfalls and Financial risks).

C. Analysis of Deviation Causes

Intelligent systems employ root cause analysis to identify the underlying reasons for deviations.

D. Intelligent Financial Reporting

Business intelligence (BI) and AI tools enable the preparation of interactive reports that assist senior management in decision-making (KPMG, 2023).

The Definition of INTOSAI

According to INTOSAI, external oversight refers to independent and objective auditing that is carried out by Supreme Audit Institutions with the aim of providing assurance with respect to the efficient use of public resources as per the legislation of that country.

Objectives of External Oversight

1. Improving transparency and accountability in the administration of public funds.
2. Adherence to the laws and regulations governing finances.
3. Assessing the performance of public institutions and determining their efficiency and effectiveness.
4. Fighting corruption and financial waste by detecting irregularities early.
5. Establishing stronger citizens' trust in public finances.
6. Providing recommendations for enhancement of financial management, as well as the quality of services offered.

Importance of External Oversight in the Public Sector

1. Protecting the public funds from misuse.
2. Enhancing financial planning and government budgets.
3. Facilitating effective economic decision-making.
4. Improving justice and accountability in governmental institutions.
5. Establishing an efficient, professional, and reputable public administration.

Chapter Five
The Practical Applied Aspect

The Effect of Artificial Intelligence on Enhancing the Quality of Financial Information for Financial Budget Planning and the Function of External Oversight (An Applied Study on a Commercial Bank)

First: Methodology of the Practical Aspect

1. Population and Sample of the Study

- **Population:** Employees of the financial, accounting, and planning departments, in addition to audit and oversight staff in the commercial bank.
- **Sample:** A total of 60 employees, randomly selected and distributed as follows:

- 20 financial employees
- 15 external audit employees
- 15 planning employees
- 10 information technology employees

Second: Study Instrument (Questionnaire)

A questionnaire was designed consisting of four dimensions measuring the following variables: (Artificial Intelligence (AI), Financial Data Quality, Planning Budgets and Enhancement of External Oversight)

Third: Characteristics of the Study Sample (Descriptive Data)

Table (1): Demographic Characteristics of the Study Sample

Variable	Category	Number	Percentage
Gender	Male	42	70%
	Female	18	30%
Educational Qualification	Bachelor's Degree	34	56.7%
	Master's Degree	20	33.3%
	PhD	6	10%
Experience	Less than 5 years	10	16.7%
	5-10 years	22	36.7%
	More than 10 years	28	46.6%

Fourth: Statistical Analysis of the Study Dimensions



A five-point Likert scale was used. The tables present the means and standard deviations.

First Dimension: Artificial Intelligence in the Commercial Bank

Table (2): Results of the Artificial Intelligence (AI) Dimension

Statement	Mean	Std. Dev.	Rank	Interpretation
1. Financial systems rely on AI algorithms for data analysis	4.21	0.77	1	High agreement
2. AI contributes to detecting accounting errors	4.18	0.81	2	High agreement
3. AI provides accurate budget forecasts	4.10	0.84	3	High agreement
4. AI helps reduce the time required to prepare budgets	4.02	0.91	4	High agreement
5. AI reduces reliance on manual work	3.95	0.87	5	Moderate agreement

Overall Findings: Mean= 4.09 (High agreement), and this indicates that the bank relies significantly on AI technologies.

Second Dimension: Financial Data Quality

Table (3): Results of the Financial Data Quality Dimension

Statement	Mean	Std. Dev.	Rank	Interpretation
Financial data are accurate and free from errors	4.15	0.74	1	High quality
Financial data are verifiable and auditable	4.12	0.80	2	High quality
Financial data are continuously updated	4.05	0.88	3	Good quality
Bank data are consistent across periods	3.98	0.90	4	Moderate quality
Financial data are complete and cover all operations	3.92	0.93	5	Moderate quality

Overall Mean: 4.044 (High quality)

Third Dimension: Planning Budgets

Table (4): Results of the Planning Budgets Dimension

Statement	Mean	Std. Dev.	Rank
Planning budgets rely on accurate data	4.20	0.70	1
Planning budgets accurately reflect future performance	4.05	0.81	2
Coordination exists among bank branches in budget preparation	4.02	0.86	3
Budgets are prepared according to specific timelines	3.94	0.89	4
Intelligent analytical software is used in budget preparation	3.88	0.92	5

Overall Mean: 4.018 (Good)

Fourth Dimension: External Oversight

Table (5): Results of the External Oversight Dimension

Statement	Mean	Std. Dev.	Rank
AI technologies help external auditors detect manipulation	4.22	0.72	1
AI systems provide real-time oversight reports	4.18	0.79	2
External oversight can review large documents quickly	4.11	0.83	3
AI improves transparency in reports	4.04	0.86	4
Technologies reduce oversight risks	3.96	0.90	5

Overall Mean: 4.102 (Excellent)

Fifth: Hypothesis Testing (Correlation and Regression Analysis)

Hypothesis 1:

"There is a statistically significant effect of artificial intelligence on financial data quality."

Table (6): Regression Analysis Results

β	T	Sig.	Decision
0.71	9.44	0.000	Hypothesis accepted

Result: AI explains 71% of the variation in financial data quality.

Hypothesis 2:

"Artificial intelligence has an effect on planning budgets."

β	T	Sig.	Decision
0.64	8.15	0.000	Hypothesis accepted



Hypothesis 3:

“Artificial intelligence has a positive effect on external oversight.”

β	T	Sig.	Decision
0.76	10.12	0.000	Hypothesis accepted

Sixth: Study Model (Applied Formulation)

Table (7): Final Statistical Model

Independent Variable	Dependent Variable	Effect Value R ²
Artificial Intelligence	Financial Data Quality	0.71
Artificial Intelligence	Planning Budgets	0.64
Artificial Intelligence	External Oversight	0.76

Overall Conclusion of the Practical Aspect

The practical point of this research was to quantify the impact of artificial intelligence on the enhancement of the quality of financial data used in the preparation of planning budgets and the efficiency of external monitoring in the commercial bank. The practical aspect of this study was conducted using a questionnaire distributed to a sample of 60 workers in the concerned departments, which include finance, external audits, planning, and information and communication technology departments.

The descriptive analysis indicated that there is a very high level of awareness and knowledge on artificial intelligence technology application by the commercial bank, which is reflected in the precision and quality of the financial information. The average score for AI was 4.09, indicating a very high level of agreement and an increase in reliance on intelligent systems by the bank for analysis of data, fault detection, and forecasts of financial results.

The findings from the finance data quality dimension established an average of 4.044, indicating that budgeting data employed is highly accurate, complete, timely, and consistent. In addition, the study proved that the use of AI technology greatly increased the reliability of data, reducing human errors, hence increasing the frequency of updates of such data.

With regard to planning budgets, the overall mean achieved 4.018, thereby reiterating the fact that budgets within this bank are improved by better information, combined with the analytical and modeling forecasting qualities enabled by technologies based on Artificial Intelligence. The respondents confirmed that intelligent systems reduced the time spent preparing budgets and improved reactivity to changes.

The external oversight element received the highest mean value with a mean of 4.102. This is largely because the use of AI technology is critical in increasing the level of transparency in the company and the ability for the external auditor to identify potential financial irregularities faster and more accurately.

The regression analysis outcome showed a high and significantly positive effect of artificial intelligence on all dependent variables, with effect values measured at 0.71 for financial data quality, 0.64 for planning budgets, and 0.76 for external control, at a significance level of 0.000, thus proving the real and direct effect caused by the intervention of artificial intelligence.

It goes without saying that the applied study proved artificial intelligence to be an important factor for enhancing information quality, planning budgets, and supervisory oversight for the commercial bank. Along similar lines, it is ostensible that the adoption of artificial intelligence is a paradigm shift, and it has turned out to be a panacea in increasing efficiency and making banks transparent.

FIRST: CONCLUSIONS

1. Artificial intelligence greatly enhances the quality of financial information utilized in the budget preparation by ensuring the information’s accuracy, consistency, and timeliness. AI systems minimize the error rate that would have resulted from the budget preparation processes.
2. Apart from the above applications of AI in the bank’s operations, the applications will provide the bank with reliable and complete information required in the planning budget.
3. Using predictive analytics and machine learning models for budgeting results in more accurate budgets because these models use historical data to forecast trends more accurately than other methods.
4. The use of artificial intelligence enhances the efficacy of the external control. This is due to the ability of the auditors, through the use of better quality, standardized, and traceable financial information, to improve the accuracy, decrease the time, as well as the cost, of the audit.
5. The AI system helps in the detection of any financial deviations and risks in a company at an early stage, which enables external control organizations to detect any abnormalities and deviations in a company’s operations and regulatory compliance in a timely fashion.



6. The integration of AI systems with the budgeting processes helps in providing greater transparency in the system, thus creating greater confidence among external auditors, regulatory bodies, and other stakeholders in the financial reports of the bank.
7. Even though the implementation process has several advantages, the process also involves some challenges such as high costs, the need for qualified technical staff, data security, and the organization's resistance to change.
8. The results of the applied research have also confirmed the existence of a statistically significant relationship between the application of artificial intelligence and the improvement of financial data quality, and between the application of artificial intelligence and the improvement of the role of external control.

SECOND: RECOMMENDATIONS

1. Commercial banks should expand the use of artificial intelligence technology in the process of financial data processing as well as budget planning systems.
2. Banks are advised to integrate AI systems with existing accounting and information systems to ensure consistency of data and to minimize duplication of efforts in maintaining a unified database of financial information useful in budgeting and external control.
3. Continuous training programs for accounting, financial, and audit staff to improve their ability to use the tools of artificial intelligence more proficiently and interpret the results obtained through the use of such tools.
4. External control organizations must revise their methodologies to include AI-based audit tools as well as other forms of data analysis to ensure their methodologies align with the dynamic changes occurring in the digital revolution of the banking industry.
5. Banks must have a robust data governance structure to safeguard financial data being accessed by AI, ensuring its confidentiality, integrity, and regulatory compliance.
6. Implementing AI systems gradually is suggested, with pilot projects being carried out first in the area of budgeting or financial analysis before the full implementation.
7. The regulatory bodies are encouraged to formulate guidelines on the usage of artificial intelligence in the context of financial reporting, budgeting, as well as auditing processes.
8. Future research is recommended to investigate the impact of AI on other banking activities such as risk management, internal control, and performance evaluation. Future comparative studies can be conducted in different banks and financial institutions.

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