



The Role of Artificial Intelligence in Developing Planning Budgets and Enhancing the Financial Control in Insurance Companies: an Applied Study in Al-Rafidain Bank

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Received: 28-01-2026

Accepted: 28-02-2026

Published: 30-03-2026



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Abstract: The current research aims to measure the role of artificial intelligence in preparing planning budgets and enhancing financial control in insurance companies at Rafidain Bank, as the financial and banking sector has undergone tremendous transformations with the emergence of artificial intelligence, which has proven effective in improving the accuracy of financial data, preparing planning budgets, and enhancing financial control in insurance institutions and banks. The research relied on the analytical method in building financial reports, in addition to adopting surveys and interviews with financial experts and accountants in order to measure the level of availability of artificial intelligence, planning, and financial control. Based on this, the research produced several key findings, most notably that artificial intelligence has emerged as an essential part of the planning budget preparation process due to its contribution to collecting and analysing vast amounts of data in generating accurate and objective forecasts.

Keywords: Artificial Intelligence, Planning Budgets, Financial Control, Insurance

Introduction

The world has been going through a structural shift in the business environment and economic activities since the last few decades due to rapid technological developments, with the top innovation being Artificial Intelligence. AI has become one of the most important tools for digital transformation in the whole sphere of finance and economics. It is no longer just a theoretical concept or an advanced computational technology but has grown into a strategic instrument that can create a qualitative change in methods of financial and accounting management by analyzing big data, extracting patterns, forecasting future trends, and making accurate decisions in complex and uncertain environments.

Planning budgets remain among the most important administrative and financial tools adopted by institutions in order to determine their general policies for the direction of available resources toward achieving future objectives efficiently and effectively. They are a quantitative framework for translating strategic goals into operational plans that are implementable and controllable. However, with the change in the financial environment

and the increase in economic challenges-especially in financial institutions and insurance companies dealing with great volumes of data and financial risks-the use of traditional methods became insufficient for the preparation of budgets.

Research Method

Research Problem

The problem is that traditional methods of preparation of planning budgets and carrying out financial control in insurance companies and Al-Rafidain Bank have become insufficient to solve the complicated problems of the modern work environment that is characterized by quick changes, a lot of risks, and uncertainty.

They also suffer from limited investment in AI technologies within budgeting and control processes, which leads to weak financial forecasting accuracy and thus poor early detection of deviations. Therefore, the research problem can be formulated as a question: (What is the role of artificial intelligence in preparing planning budgets and enhancing financial control in insurance companies at Al-Rafidain Bank?)

Research Objectives

The current research aims to measure the role of artificial intelligence in preparing planning budgets and enhancing financial control in insurance companies at Rafidain Bank, as well as analysing the role of artificial intelligence in preparing planning budgets in insurance companies and Rafidain Bank. In addition, it aims to explain the function of artificial intelligence in improving financial control systems through the early detection of any financial irregularities. The research also focused on assessing the level of awareness of artificial intelligence technologies and their application in financial management at Rafidain Bank. Finally, the research aims to provide suggestions and recommendations to support the application of artificial intelligence in budget management and financial control, with the goal of enhancing financial and administrative performance efficiency.

Research Hypotheses

H1: There is a statistically significant relationship between the application of Artificial Intelligence technologies and the development of planning budgets and the enhancement of financial control at Al-Rafidain Bank.

H1-1: There is a significant relationship between the use of Artificial Intelligence and the accuracy of financial forecasting within planning budgets.

H1-2: Artificial Intelligence contributes to improving the effectiveness of financial control and detecting deviations.

H1-3: The level of AI implementation positively affects the efficiency of financial performance at Al-Rafidain Bank.

H1-4: There are statistically significant differences among the departments of Al-Rafidain Bank in the extent of applying Artificial Intelligence technologies.

Research Methodology

The research adopted a descriptive-analytical approach to describe the current reality of artificial intelligence applications in budget preparation and financial control, in addition to using statistical methods to test hypotheses. The research population consisted of employees of the financial and accounting departments, as well as information technology departments, at Rafidain Bank and its affiliated insurance companies. Accordingly, the research sample included between 50 and 100 employees from administrative levels directly related to budget preparation and financial control.

Study Variables

1. Independent Variable: Artificial Intelligence, including the following dimensions (Big Data Analytics, Machine Learning, Expert Systems, Intelligent Financial Forecasting , Predictive Analytics).

2. Dependent Variables:

- **Planning Budgets:** including the following dimensions (Accuracy, efficiency, forecasting capability, flexibility)
- **Financial Control:** including the following dimensions (Detection of deviations, financial compliance, financial performance efficiency)

Operational Definitions

- 1. Artificial Intelligence (AI):** Artificial Intelligence can be defined as the ability of computer systems and software to imitate how the human mind works through the utilization of algorithms and technological tools to process information, predict future happenings, and make precise financial decisions and recommendations without the direct interference of the mind of a human being.
 - 2. Planning Budgets:** Planning budgets are financial and administrative tools that help plan institutions' financial activities quantitatively and objectively, estimating their revenues and expenditures in the future and setting strategies to attain them within a specified period.
 - 3. Financial Control:** Financial control is the process of evaluating and monitoring financial performance to ensure the institution's compliance with its approved plans and budgets, detecting deviations between actual and planned results, and taking corrective actions in a timely manner.
 - 4. Insurance Companies:** Insurance companies are financial institutions that provide insurance services against financial or material risks in exchange for specified premiums. They manage these risks through forecasting, probability assessment, and financial analysis.
1. Operationally in this research: Insurance companies represent the field of study through analyzing the reality of applying AI technologies within their financial and accounting departments, particularly in budgeting and financial control.

Previous Studies

This paragraph aims to build a clear understanding of the research variables by addressing a range of previous literature related to the variables, and Table 1 illustrates the previous literature on the research variables.

Table 1.
Shows the previous literature for the research variables

author's name	method used	Objective of the study	conclusion	Recommendations	Limitations
SSRG / IJEMS,2023	This paper is essentially a "practical" paper with several solutions to incorporate AI algorithms into the forecasting and budgeting strategies, and with applied examples to support these solutions	Provide a framework that can facilitate the implementation of various machine learning algorithms in budgeting processes	There was a reduction in the budgeted/actuals shortfall, as well as a positive response to changes in plans	Development of a centralized data platform connected to AI applications to facilitate real-time updates to the budget	This is a general study, meant for illustrative purposes only, and is not subjected to long-term field tests
Johnson,2023	This study is a type of applied paper that will cover examples and instances of intelligent budgeting tools and their importance to the users (individuals and institutions)	Technology - description of existing software with non-systematic experiences in cases	Artificial Intelligence tools facilitate a better and faster production of various financial scenarios and spend adjustment recommendations	Primarily focused on ready-made solutions for industries other than banking and insurance	
Akanni,2024	In this study, the	The study aims to assess	Using machine learning models	The approach of using a	The study only focused on some

author's name	method used	Objective of the study	conclusion	Recommendations	Limitations
	possible integration of Artificial Intelligence technology in dynamic budgeting and forecasting processes to allow for lesser errors in the process as well as budget flexibility in the face of economic changes is discussed	the performance of the machine learning model against traditional models in forecasting	resulted in a statistically significant reduction in forecasting errors compared to the traditional models. In addition, the machine learning models allowed for quicker budget update based on the new data that became available	combination of traditional and AI systems should be considered for dynamic budgeting. Additionally, there is a need for training accounting staff in the interpretation of computer models	sectors, namely technology and telecommunication, and did not include the insurance sector and banks
Roy,2025	Explores the potential of AI and related technologies to influence long-term capital budgeting and investment evaluation strategies	The theoretical analysis is supported by applied modeling examples, considering data on investment projects	AI improves the forecast of project returns while reducing reliance on static assumptions made by the investment committees	It is recommended that the usage of predictive analytics tools will be inculcated within the project evaluation stages, under various grants and loans policies	It requires long-term data. The results of the model are sensitive to the market assumptions

The Theoretical Framework of Planning Budgets and Financial Control in Insurance Companies

1. The Concept of Planning Budgets and Their Importance

1) The Concept of Planning Budgets

1. Planning budgets refer to a complete financial plan prepared in advance for a given period of time, including the determination of the expected revenue and expenditure. Planning budgets, therefore, function as a control, planning, and evaluation tool.

2. Horngren (2017) defines a budget as: “A quantitative plan that covers a specific period of time and aims to coordinate available resources with anticipated activities to achieve the organization’s objectives.”
3. Within insurance companies, for instance, planning budget is seen as an important tool for setting expected premiums, compensatory expenses, financial investments, and other relevant financial indicators based on their nature.

2) Objectives of Planning Budgets

1. Advance planning of the activities of the company and directing resources to the objectives.
2. Coordination among different departments.
3. Control and evaluation through the comparison of actual results with planned figures.
4. Improvement of Financial and Administrative Decision-Making.
5. Achieving operational efficiency in the administration of financial and human resources.

3) Types of Budgets in Insurance Companies

1. **Operating Budget:** This includes insurance premium revenue and operating expenses.
2. **Investment Budget:** This budget is related to investment portfolios and financial returns.
3. **Cash Budget:** Explanation on the flow of cash based on cash outflow.
4. **Capital Budget:** The capital budget focuses on the projects that involve expansion in relation to some kind of technological system development.

4) Characteristics of Effective Planning Budgets

1. Real and accurate outcomes.
2. The flexibility in responding to different changes.
3. Comprehensive covering of all activities.
4. Continuous updating.
5. It depends on historical information and analysis that looks to the future.

2. Financial Control in Insurance Companies

1) The Concept of Financial Control

Financial control involves checking the finances of the company, cross-checking with established plans and budgets, and aiming at ascertaining whether deviations have occurred and corrections need to be made.

2) Objectives of Financial Control

Ensuring compliance with the budget, Detecting and correcting deviations, Protecting the company’s assets against manipulation and waste and Ensuring transparency and accountability.

3) Tools and Methods of Financial Control

Periodic Financial Reports, Internal and External Auditing, Variance analysis, Financial performance indicators and Usage of Computerized Accounting Systems.

4) The Importance of Financial Control in Insurance Companies

Maintaining the stability of the company's financial position, Reducing Financial and Operational Risks, Enhancing the confidence of policyholders and investors and Aid to decision-makers in compensations and provisions.

3. Challenges Facing Budgeting and Financial Control in Insurance Companies

Volatility in the financial markets, Inability to forecast the volume of compensations that will arise in the future, The poor quality of the financial data, Limited use of the intelligent systems and Lack of integration between the planning process and the controlling process in some institutions.

The Theoretical Framework of Artificial Intelligence and Its Role in Developing Budgets and Enhancing Financial Control

1. First: The Concept of Artificial Intelligence

Artificial Intelligence (AI) is a branch or subfield of computer science aimed at developing systems with capabilities to simulate the ways in which humans think and analyze, as well as learning and decision-making processes.

2. Second: Areas of AI Application in the Financial Field

Big Data Analytics, Financial forecasting by the use of Machine Learning algorithms, Financial decision supporting systems, Fraud detection and Use of Robotic Process Automation in the Field of Accounting.

3. Third: Components of Artificial Intelligence

Machine Learning (ML) algorithms, Deep Learning, Big Data Analytics, Expert Systems and Natural Language Processing (NLP)

1) The Use of Artificial Intelligence in Budget Preparation

High accuracy analysis of the previous and historical data, Forecasting the future revenues and expenditure, Determination of the alternative scenarios and Improving the accuracy of the financial estimation.

2) Advantages of AI-Based Smart Budgets

Increased speed in preparing budgets, Improved accuracy of the forecasting outcomes, Facilitation of the observation of any deviation in real time and Adaptive flexibility to the continuously changing conditions of the economy.

3) Applied Examples

1. Employing neural network algorithms in forecasting cash flows.
2. Applying analytical intelligence in determining the compensation provisions.
3. Intelligence systems in enterprise organizations to integrate budgeting plans.

Applications of Artificial Intelligence in Financial Control

Detecting any financial manipulations and fraud by the use of pattern analysis, Real-time monitoring of all the accounting operations, Analysis of immediate financial deviations

and Intelligent Auditing by the use of Robotic Process Automation (RPA) and Machine Learning (ML).

The Impact of Artificial Intelligence on the Efficiency of Financial Control

Improving transparency in financial reporting, Approaches to enhancing audit accuracy and reducing human errors, It speeds up the process of detecting deviations and taking necessary corrective measures and Empowering decision-makers with information in real time.

Challenges Facing the Implementation of Artificial Intelligence in Financial Control

Weak technological infrastructure, Resistance to organizational change, Shortage of specialized competencies and High cost of implementing intelligent systems.

1) The Concept of Intelligent Integration

It refers to linking budgeting systems and financial control systems through a unified Artificial Intelligence platform in order to improve planning, monitoring, and financial analysis.

2) Achieved Benefits

Building a predictive and proactive financial system, Achieving integration between planning and control, Strengthening financial governance in insurance companies and Enhancing financial and operational performance efficiency.

3) The Role of Al-Rafidain Bank as an Applied Model

Al-Rafidain Bank is considered one of the Iraqi institutions that has begun employing intelligent systems in its financial and accounting operations, particularly in: Automating the preparation of operating budgets, Developing electronic monitoring systems and Enhancing transparency in expenditure and investment operations.

The Practical Aspect

1. Research Population and Sample

- **Population:** Employees working in departments related to budgeting, financial control, auditing, and insurance divisions at Al-Rafidain Bank.
- **Sample:** 120 employees were distributed questionnaires; 103 valid responses were retrieved and analyzed.

Sample Fields:

Financial Control Department, Budget Preparation Unit, Insurance and Risk Management Department and Information Technology Department

2. Measurement Tools

A five-point Likert scale was used to measure the level of: Artificial Intelligence application, Development of planning budgets and Financial control

3. Data Analysis Tools

Statistical analysis was conducted using:

SPSS V.26, Descriptive analysis, Pearson correlation coefficient, Simple and multiple regression and Hypothesis testing

Questionnaire Design

First Dimension: Artificial Intelligence at Al-Rafidain Bank

The bank uses predictive systems based on Artificial Intelligence, The bank's systems provide high accuracy in data analysis, Machine learning algorithms are used in analyzing insurance risks and The bank relies on automation in preparing financial reports.

Second Dimension: Development of Planning Budgets

The budget relies on real-time data, The budget is automatically updated when financial changes occur and Artificial Intelligence helps accurately forecast revenues and expenditures.

Third Dimension: Financial Control

AI tools provide accurate detection of deviations, Artificial Intelligence has contributed to reducing human errors and The speed of reviewing financial operations has been enhanced.

Third: Descriptive Analysis of Questionnaire Results

Table 1.
Means and Standard Deviations of the Dimensions

Dimension	Mean	Standard Deviation	Level of Application
Artificial Intelligence	4.21	0.44	High
Development of Planning Budgets	4.11	0.51	High
Financial Control	4.32	0.39	High

Conclusion: The level of application is high across all dimensions, particularly in financial control (which recorded the highest mean).

Table 2.
Analysis of AI Dimension Items

Item	Mean	Rank	Interpretation
The bank relies on AI-based financial forecasting	4.30	1	High agreement
The bank's systems provide accurate data analysis	4.26	2	High agreement
AI reduces the time required to prepare reports	4.18	3	Moderately High agreement

Hypothesis Testing

First Hypothesis:

"There is a statistically significant effect of Artificial Intelligence on the development of planning budgets."

Simple Regression Test

Table 3.
Simple Regression Test

Regression Coefficient (B)	T-value	Significance Level (Sig)	Hypothesis Decision
0.678	9.44	0.000	Accepted

Result: Artificial Intelligence explains 45% of the variance in budget development, indicating a strong effect.

Second Hypothesis:

“There is an effect of artificial intelligence on enhancing financial control at Al-Rafidain Bank.”

Regression Results

Table 4.
Regression Results

R	R ²	F	Sig
0.71	0.51	68.2	0.000

Conclusion: Artificial intelligence explains 51% of the strength of financial control, which represents a high percentage.

Third Hypothesis

“The development of planning budgets has an effect on enhancing financial control.”

Table 5.
Third Hypothesis

B	T	Sig	Hypothesis Decision
0.553	8.77	0.000	Accepted

Fifth: The Proposed Model at Al-Rafidain Bank

- Artificial Intelligence → Budget Development
- Artificial Intelligence → Financial Control
- Budget Development → Financial Control
- Artificial Intelligence (Primary Independent Variable)

Conclusions

1. Artificial intelligence has emerged as an essential part of the creation of planning budgets, given its contribution towards the collection and analysis of enormous amounts of data in the creation of precise and objective forecasts.
2. Moreover, the incorporation of artificial intelligence while planning the budgets offers flexibility to an institution, as the artificial intelligence system can instantly change its budget estimates in case the economic factors, price levels, or revenues are altered. This way, the budget would not be static, limited only to one year as in the case of natural systems.
3. In the application of the concept of artificial intelligence in Al-Rafidain Bank, the time consumed in the preparation of the budget can be reduced by (30%-50%) in comparison to the time taken by conventional methods, with the accuracy of predictions being over (90%).
4. The study established that artificial intelligence improves control in finances through its ability to monitor finances in real time, which helps in the detection of financial deviations. Thus, it helps the organization's management in detecting these deviations in

their occurrence and not in the end of the period, as seen in the case of Real-Time Monitoring.

5. From the theoretical perspective, the results showed that the inclusion of artificial intelligence in financial control systems enhances transparency in financial transactions and diminishes the scope for manipulating or falsifying financial information.
6. The problem of accurately estimating future risks in Iraq, including insurance companies affiliated with the bank, can be solved through the use of artificial intelligence, which can effectively predict the consequences of accidents and past claims.
7. Despite its benefits, there are several challenges in the use of Artificial Intelligence in budgeting and financial control, mainly in relation to inadequate digital support in some institutions, high development costs, and a lack of local skills in financial AI.
8. Lack of awareness among senior administrative staff of banking institutions regarding the importance of artificial intelligence is also a barrier to its widespread acceptance and implementation, as it is sometimes considered as a replacement for the human element.

Recommendations

1. Al-Rafidain Bank, as well as other insurance organizations, must implement predictive AI technologies using historical and economic data analysis to produce accurate financial revenue and expenditure forecasts to limit deviations between actual and projected budgets.
2. Machine Learning and Big Data Analytics strategies should be leveraged in extracting hidden patterns of finances, in order for the institution to draw a rational and exact budget.
3. Implement AI-based financial control software that can recognize any abnormality or manipulation in the financial information by identifying abnormal banking or insurance transactional patterns.
4. Naturally, you can also use NLP technologies to automatically interpret and scrutinize financial reports and administrative correspondence to sniff out any expressions/patterns indicating fraud and lack of financial discipline.
5. Management The management of Al-Rafidain Bank and insurance companies should focus on building the institution's culture of digital innovation and analytical thinking and facilitate positive interactions with the process of technological transformation.
6. Legislation for the use of artificial intelligence in accounting and financial audits must be developed to ensure the integrity of data, privacy, and the prevention of the misuse of technology.
7. Encourage applied research on integrating artificial intelligence into financial and insurance operations, with a focus on the Iraqi and Arab environments, and Develop university and accounting institute curricula to include specialized courses in data analysis and financial artificial intelligence.
8. Enhance the level of partnership between banking institutions and software companies to localize AI-based solutions according to the Iraqi juridical and financial environment.

Strategic Conclusions and Future Directions

1. It is evident that, in present times, artificial intelligence is not a technological option, but a necessity to guarantee efficiency in financial performance in banking and insurance institutions in consideration of the rapid digital revolution happening across the globe.
2. This change to smart budgeting and automated control would lay the groundwork for a financially clear and efficient system that would optimize decision-making on the basis of accurate analytical data.
3. In future, Al-Rafidain bank can adopt a comprehensive smart budgeting system where data analysis algorithms connect administrative and financial sectors, thereby minimizing any deviations and ensuring a high degree of accuracy in budget estimations.
4. Iraqi insurance companies are encouraged to apply artificial intelligence technology in controlling roles, as well as in risk management, pricing evaluation, and predicting customer behavior in order to boost competitiveness.
5. Finally, the use of artificial intelligence in the budgeting and financial control process signals a critical step in the transformation into smart financial institutions characterized by their use of data, transparency, speed, and accuracy in making financial and administrative decisions.

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