

The Role of Internal Auditing in Light of Information Technology in Achieving the Dimensions of Sustainable Development for Iraqi Insurance Companies

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Abstract: The current research aims to demonstrate the relationship between internal auditing in light of information technology to achieve the dimensions of sustainable development in Iraqi insurance companies. The research relied on a questionnaire to analyze the companies' data and obtain their results. The results showed the existence of a correlation and influence between the two variables, the necessity for internal auditing to develop its internal system to contribute to evaluating the performance of risk management and developing its techniques using information technology (IT) methods and any other methods in dealing with risks. This relationship is examined in the context of digital transformation initiatives currently adopted by Iraqi insurance companies, in which internal auditing functions increasingly rely on IT systems for risk assessment, governance monitoring, and performance evaluation. The study further investigates the contribution of IT-enabled internal audit practices to enhancing the economic, environmental, social, and institutional dimensions of sustainable development. Data collected from a sample of insurance companies listed on the Iraq Stock Exchange were statistically analyzed using correlation and regression techniques to determine the strength and direction of the relationship between internal auditing effectiveness and sustainability indicators. The empirical findings indicate a statistically significant correlation between IT-supported internal auditing and sustainable development dimensions, with internal auditing explaining approximately 33% of the variance in sustainability outcomes ($R^2 = 0.33$). These results highlight the critical role of digital auditing tools in improving governance quality, strengthening risk management mechanisms, and supporting long-term organizational sustainability within the Iraqi insurance sector.

1 INTRODUCTION

The start of companies to achieve sustainable development begins from within by designing organizational structures on standard bases from professional bodies that are flexible and compatible with the environment. The expansion of the business environment has led to the weakness of internal auditing structures and roles in light of recent developments in information technology, which has negatively affected the achievement of sustainable development, especially in Iraq, as Iraqi economic units face many challenges in their quest to achieve economic, social, environmental and institutional growth, which requires a strategic direction and integrated efforts to achieve them, so reviewing the structures and operations of internal auditing by applying new methods and modern procedures that

may contribute to its modernization, especially in light of the use of information technology and to avoid unexpected crises within the local environment, especially changes and fluctuations, it has become necessary to have organizational structures and internal auditing operations that enable economic units to achieve their goals and achieve the dimensions of sustainable development. Therefore, the main objective of the research is to demonstrate the relationship between internal auditing and sustainable development in light of information technology using a questionnaire distributed to employees of the National Insurance Company and companies listed on the Iraq Stock Exchange. These are (Al-Ahlia Insurance, Dar Al-Salam Insurance, Al-Hamra Insurance, Al-Ameen Insurance).

2 BACKGROUND

2.1 Internal Audit

Internal audits play a major role in adding value through the performance of assurance and consulting engagements, as their operational, tactical, and strategic work contributes to improving the internal operations of the economic unit [1]. It is defined as an independent and objective advisory and assurance activity that adds value, supports the operations of the economic unit [2]. Information technology (IT) contributes to the internal audit mission in several ways. There are many programs used in audit procedures such as word processing and spreadsheets [3]. IT simplifies employee jobs by automating them, making their tasks such as communications and various work-related activities easier to perform [4], [5]. Internal audit should enjoy functional independence from the executive authority, and its role in enhancing corporate governance should be evaluated at three levels: the level of reducing information asymmetry, the level of the internal control system, and the level of risk management [6]. International Auditing Standard (1100) indicates that its activity should be independent and objective in performing its duties by clarifying the role of the Chief Executive Officer of Internal Audit by submitting his reports to an organizational level within the economic unit that allows for the fulfillment of his responsibilities, in addition to the fact that the scope of his work should be free from interference [7]. Audit independence is defined as freedom from conditions and circumstances that limit the internal audit activity or the CEO to perform his duties objectively by achieving the requirements of the necessary degree of independence through unrestricted and direct access to management and the Board of Directors [8].

2.2 Dimensions of Sustainable Development

Sustainability is a model for future thinking in which environmental, social, and economic considerations become similar to achieving and improving the quality of life and seeking to address international challenges in the current and future constructively and creatively by creating highly resilient and sustainable societies [9]. Moreover, the term sustainable development is not limited to economic development, but rather, goes beyond it to include a wide range of multifaceted problems in managing the economy, environment, and society, so that these

three elements form the basic pillars of sustainable development [10], [11]. The environmental dimension of sustainable development also focuses on adhering to environmental boundaries so that each ecosystem has specific limits that cannot be ignored from consumption and depletion [12], meaning that a sustainable ecosystem should maintain the resource base stable while Avoiding excessive depletion of renewable resource systems or ecological sink functions and consuming non-renewable resources only to the extent permitted by investment in available alternatives by maintaining biodiversity and atmospheric stability [13]. The collective dimension is represented by the report (Our Common Future/Brutland) which emphasizes the importance of population in sustainable development [14]. The institutional dimension is represented by the departments and public economic units that represent the executive tool of the state through which it draws and implements its economic, environmental, and social development policy [15].

2.3 The Role of Internal Audit in Achieving Sustainable Development

Internal auditing is considered a product of modern economic and social development in light of the rapid development in IT and the increasing scope of operations with the emergence of companies of different sizes, branches, and organizational levels, which led to the inability of heads of administrative formations to carry out their work tasks directly. In contrast, the increased growth of joint-stock companies in terms of size, complexity, and scope of their work led to the need for some full-time representatives to do so on their behalf, which contributed to increasing the need for the existence of the internal audit function as an entity linked to the company's board of directors [15]. Many economic units are now under pressure to develop vital plans and activities to meet their financial needs while not neglecting to preserve the necessary social and environmental resources in the future.

Internal audits can play important roles in designing and implementing a sustainable development management system, helping to raise awareness of and train employees on sustainable development, conducting limited scope reviews requested by senior management, compliance reviews, advising on the appointment of outside experts, and coordinating internal audit activities with external experts. Environmental auditing is also considered an administrative tool in a regular, documented, periodic, and objective assessment of

the quality of environmental and administrative organization and equipment to support environmental protection [16], [17]. Social auditing can verify the commitment to social responsibility of the economic unit by clarifying how to implement social and environmental programs and the reflection of these procedures on social, environmental, and societal goals [18], and thus the internal contributes to creating added value for the economic unit and thus helps it achieve its goals through continuous and systematic evaluation of risk management, control, and governance processes by providing suggestions that help it strengthen and increase its effectiveness [19], [20].

3 SAMPLE AND HYPOTHESIS

3.1 Sample

The research sample consists of four insurance companies listed on the Iraq Stock Exchange, namely (Al-Ahlia Insurance, Dar Al-Salam, Al-Hamrra Insurance, and Al-Ameen Insurance) and the National Insurance Company for the government sector. The number of distributed questionnaires was (173) questionnaires and the number of questionnaires subject to analysis was (158) questionnaires. All data was analyzed using the SPSS program.

3.2 Questionnaire analysis results

3.2.1 Internal Audit

The arithmetic mean (AM) for the internal audit dimension is (3.88), which is higher than the hypothetical mean (3.00). This indicates a generally positive perception of internal auditing practices in Iraqi insurance companies, with a standard deviation (SD) of (0.61), suggesting consistency in responses among participants.

As shown in Table 1, all items demonstrate relatively high mean values, indicating agreement with statements related to internal audit effectiveness under IT environments. Item (1) (AM = 3.99) indicates that internal audit independence and unrestricted access to information systems are essential factors in enhancing audit effectiveness and risk mitigation through IT-based tools. Item (2) (AM = 3.84) reflects that internal audit contributes to improving governance quality and investor confidence by supporting long-term performance

evaluation, particularly through the adoption of modern IT-supported audit practices.

Item (3) (AM = 4.02) shows that effective communication between internal audit units and senior management is critical for timely reporting of risks and deviations, which enhances governance and risk management efficiency. Item (4) (AM = 4.04) further confirms that continuous coordination between internal audit and management supports alignment with strategic objectives and facilitates the integration of information technology in audit procedures.

Item (5) (AM = 3.53) indicates moderate agreement regarding the role of internal audit in evaluating risk management systems and improving audit techniques using information technology. Overall, the results suggest that IT-enabled internal auditing plays a significant role in strengthening audit effectiveness and risk management practices within the studied companies.

3.2.2 The Analysis of the Sustainable Development Dimension

The overall mean value for the sustainable development dimension is (3.78), which exceeds the hypothetical mean (3.00), indicating a positive perception of sustainability practices in Iraqi insurance companies. The standard deviation (SD = 0.65) reflects a high level of response consistency.

At the dimensional level, the economic dimension records a mean of (3.93, SD = 0.58), indicating strong agreement that insurance companies are increasingly integrating sustainability principles into their economic activities.

3.2.2.1 Environmental Dimension

The environmental dimension shows a mean value of (3.72), which is higher than the hypothetical mean (3.00). This indicates a generally positive perception of environmental practices in Iraqi insurance companies, with a standard deviation of (0.67), reflecting consistency among responses.

As presented in Table 3, item (1) records a mean value of (3.68), indicating that environmental auditing and mitigation of negative environmental impacts are perceived as important components of corporate social responsibility. Item (2) (AM = 3.67) shows that continuous improvement in occupational safety, workplace conditions, and environmental health is an ongoing organizational priority requiring sustained commitment.

Table 1: The internal audit analysis.

	Paragraphs	AM	SD
1	Internal audit is completely independent of management and has direct access to the people, resources, and information it needs to add value through its advisory and assurance work within the economic unit.	3.99	0.89
2	Internal audit provides the Board of Directors and senior management with independent, objective assurance regarding the adequacy and effectiveness of governance and risk management.	3.84	0.90
3	Communication between internal audit and management or the audit committee is enhanced to inform them through reports of deviations and material risks in a timely manner.	4.02	0.84
4	There is regular communication between internal audit and management to ensure that internal audit work is relevant and consistent with the strategic and operational needs of the business unit.	4.04	0.76
5	Internal audits do not evaluate risk management performance, risk management techniques, and actions taken in this regard.	3.53	1.03
	general arithmetic mean	3.88	0.61

Table 2: Economic dimension.

	Paragraphs	AM	SD
1	The sustainable development of an economic unit indicates that it has the ability to carry out its activities in a responsible manner and to ensure the rights of present and future generations.	4.13	0.69
2	The Economic Unit integrates ESG-related risks into the Economic Unit culture, and information is reported to meet regulatory obligations and support decision-making.	3.89	0.70
3	Information on ESG risks is reported externally to meet regulatory obligations and support decision-making.	3.87	0.77
4	The Economic Unit works to achieve transparency, justice, and protection for stakeholders, which contributes to attracting local and foreign investors in a manner consistent with the environment, society, and governance.	3.88	0.82
5	Economic units seek to exploit natural resources in the best possible way, which contributes to their positive impact on society, including providing job opportunities.	3.97	0.80
6	The economic unit grants the right to invest according to the economic feasibility of the project and its impact on society.	3.86	0.89
	general arithmetic mean	3.93	0.58

Table 3: The environmental dimensions.

	Paragraphs	AM	SD
1	The economic unit audits environmental activities and addresses harmful negative.	3.68	0.82
2	Improvements in the work environment, occupational safety, and health care related to the environment, society, and governance are being pursued.	3.67	0.70
3	The senior management of the economic unit follows the instructions of international environmental organizations and quantitative indicators to evaluate internal control mechanisms in preparing sustainable development reports.	3.80	0.84
4	The economic unit is committed to the laws, legislation, regulatory processes, and the set of mechanisms through which decision-makers influence environmental actions and outcomes.	3.87	0.77
5	The economic unit works to improve the environment by increasing green spaces.	3.57	1.02
6	The economic unit adopts long-term plans to address future environmental risks.	3.73	0.99
	general arithmetic mean	3.72	0.67

Item (3) (AM = 3.80) indicates that compliance with international environmental standards and monitoring indicators reflects the commitment of senior management to environmental responsibility, which contributes to improved organizational performance and sustainability-oriented reputation.

Item (4) (AM = 3.87) demonstrates strong compliance with environmental laws and regulations, highlighting the role of governance structures in ensuring environmental protection and regulatory alignment.

Item (5) (AM = 3.57) reflects moderate agreement regarding initiatives to expand green spaces, indicating that environmental improvement practices are still developing but positively perceived. Item (6) (AM = 3.73) shows that long-term environmental risk planning is considered necessary for minimizing future environmental impacts and ensuring organizational resilience.

Overall, the results suggest that environmental sustainability practices are moderately integrated into operational and governance processes, particularly through regulatory compliance and risk-oriented environmental planning.

3.2.2.2 Social Dimension

The social dimension records a mean value of (3.69), which is above the hypothetical mean (3.00), indicating a positive perception of social responsibility practices within Iraqi insurance companies. The standard deviation (SD = 0.74) indicates a relatively homogeneous distribution of responses.

As shown in Table 4, item (1) (AM = 3.68) indicates that customer and community satisfaction assessment practices are moderately implemented to improve service quality. Item (2) (AM = 3.79) reflects that the adoption of modern service delivery methods contributes to improving service efficiency and responsiveness to community needs.

Item (3) (AM = 3.92) demonstrates strong agreement that human resource policies, including incentives and job creation, play an important role in enhancing organizational performance and social contribution. Item (4) (AM = 3.86) indicates that responsiveness to public opinion regarding social and environmental issues supports organizational continuity and stakeholder trust.

Item (5) (AM = 3.20) shows lower agreement, suggesting that cultural, health, and educational initiatives are not consistently prioritized across the sampled companies.

Overall, the findings indicate that social sustainability practices are primarily focused on service quality improvement, human resource development, and stakeholder responsiveness, while broader community development initiatives remain less developed.

Table 4: The social dimensions.

	Paragraphs	AM	SD
1	The Economic Unit conducts surveys to assess community satisfaction with the services provided.	3.68	0.99
2	The Economic Unit works to provide high-quality services that benefit the community by introducing modern and advanced methods.	3.79	0.94
3	The Economic Unit adopts appropriate policies that contribute to creating diverse job opportunities, including motivating and rewarding employees with experience and professional competence.	0.93	3.92
4	The Economic Unit responds to the growing public opinion on social and environmental issues, which helps its business to continue.	3.86	0.82
5	There is no need for the economic unit to provide cultural, health, and educational services that lead to increased social solidarity for all members of society.	3.20	1.09
	general arithmetic mean	3.69	0.74

As shown in Table 4, the social dimension is further supported by item-level analysis. Item (1) (AM = 3.68) indicates that customer satisfaction surveys are moderately applied as a tool for understanding client needs and improving service quality. Item (2) (AM = 3.79) shows that the adoption of modern technologies, particularly information technology, contributes to improving communication efficiency and service delivery.

Item (3) (AM = 3.92) reflects strong agreement that human resource policies, including incentive systems and professional development, enhance employee performance and organizational competitiveness. Item (4) (AM = 3.86) indicates that responsiveness to public opinion on social and environmental issues supports organizational legitimacy and stakeholder engagement.

In contrast, item (5) (AM = 3.20) reflects a lower level of agreement, indicating that cultural, health, and educational initiatives are not consistently integrated into the operational priorities of the surveyed companies.

Overall, the results suggest that social sustainability is primarily driven by service quality improvement, human resource management, and stakeholder communication, while broader community development initiatives remain relatively limited.

Table 5: The institutional dimensions.

	Paragraphs	AM	SD
1	The institutional dimension contributes to strengthening the community’s confidence in the soundness of the process of developing the performance of economic units, which requires good administrative rules.	3.83	0.78
2	The institutional dimension helps the economic unit, through the presence of strong organizational structures and risk management, to ensure the best return on its investments, leading to more job opportunities and economic development.	3.82	0.81
3	Strengthening internal control helps develop the performance of the economic unit, improve the quality of control reports, and achieve the institutional dimension of sustainable development.	3.99	0.76
4	Economic units do not seek, through the institutional dimension, to adopt long-term plans and strategies to meet the needs of society.	3.43	1.05
	general arithmetic mean	3.77	0.61

3.2.2.3 Institutional Dimension

The institutional dimension records an overall mean value of (3.77), which is higher than the hypothetical mean (3.00), indicating a generally positive perception of institutional governance practices. The standard deviation (SD = 0.61) reflects a high level of consistency among respondents.

As shown in Table 5, item (1) (AM = 3.83) indicates that institutional governance contributes to strengthening public trust through the application of governance principles such as transparency and accountability. Item (2) (AM = 3.82) shows that strong organizational structures and risk management systems contribute to improved investment outcomes and economic development.

Item (3) (AM = 3.99) reflects strong agreement that internal control systems play a key role in enhancing performance quality and supporting sustainable development objectives through improved reporting and regulatory compliance.

Item (4) (AM = 3.43) indicates a relatively lower level of agreement regarding long-term strategic planning, suggesting variability in the extent to which such planning is embedded in institutional practices across the sampled companies.

Overall, the institutional dimension is characterized by relatively strong governance and control mechanisms, while long-term strategic orientation appears less consistently implemented.

3.3 Hypothesis Testing

3.3.1 Correlation Analysis

The first hypothesis examined the relationship between internal auditing and the dimensions of sustainable development.

- Null hypothesis (H0): There is no significant correlation between internal auditing and sustainable development dimensions.
- Alternative hypothesis (H1): There is a significant correlation between internal auditing and sustainable development dimensions.

The results of Pearson correlation analysis indicate a statistically significant relationship between the two variables. The calculated t-value (t = 8.89) exceeds the tabulated value (t = 1.98) at a significance level of 0.05 and 156 degrees of freedom. Accordingly, the null hypothesis is rejected and the alternative hypothesis is accepted.

The correlation coefficient (r = 0.58) indicates a moderate to strong positive relationship, suggesting that improvements in internal auditing practices are associated with higher levels of sustainable development dimensions.

3.3.2 Testing Regression Hypotheses

The second hypothesis tested the effect of internal auditing on sustainable development dimensions.

- Null hypothesis (H0). Internal auditing has no significant effect on sustainable development dimensions.
- Alternative hypothesis (H1). Internal auditing has a significant effect on sustainable development dimensions.

The results of simple linear regression analysis show that the model is statistically significant. The calculated F-value (F = 77.04) is higher than the tabulated value (F = 3.90) at a significance level of 0.05, confirming the overall significance of the regression model.

The coefficient of determination ($R^2 = 0.33$) indicates that internal auditing explains 33% of the variation in sustainable development dimensions, while the remaining variation is attributed to other factors not included in the model.

The regression coefficient ($\beta = 0.51$) is positive and statistically significant ($t = 8.78 > 1.98$), indicating that internal auditing has a positive effect on sustainable development. This means that an improvement in internal auditing practices is associated with an increase in sustainable development performance; however, this effect should be interpreted in terms of regression magnitude rather than percentage increase.

4 CONCLUSIONS

Based on the results we obtained and the hypothesis proven in the research, the results reach the following conclusions:

- There is a correlation between internal auditing in light of information technology and the dimensions of sustainable development.
- There is a positive impact of internal auditing in light of information technology on the dimensions of sustainable development.
- Regular communication between the internal audit department and senior management is one of the most important pillars of the success of its tasks which ensures the work of internal auditing towards achieving the strategic and operational goals of the economic unit. It is possible to introduce information technology methods in developing its tools and methods in its functional work which contribute to achieving the dimensions of sustainable development.
- The need for an audit to develop its internal system to help evaluate the performance of risk management and develop its techniques using information technology methods and any other methods in dealing with risks.
- The modern development of information technology has helped internal auditing adopt modern methods in its work which helps it provide independent and necessary assurance to the economic unit which is reflected in the dimensions of sustainable development.
- The governments, companies, and individuals should work together to address the problems of the dimensions of sustainable development and keep pace with sustainability standards at the international level, and at the national level,

the results may lead to the adoption of policies. National encourages appropriate disclosure of sustainable development dimensions by providing incentives to companies that adopt integrated disclosure practices.

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