

The Impact of Implementing Accounting Information Systems on Improving Internal Audit Effectiveness: An Applied Study on Jordanian Pharmaceutical Companies

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Abstract

The purpose of this study is to ascertain how Jordanian pharmaceutical companies are affected by The Impact of Implementing Accounting Information Systems on Improving Internal Audit Effectiveness: An Applied Study. This study makes use of SPSS software and a quantitative methodology. A Likert scale is used to conduct a variables measuring scale. The study population comprised six firms that manufacture pharmaceuticals for human use in Jordan and are listed on the Amman Stock Exchange. A total of 350 questionnaires were sent to the study sample. These findings imply that the efficacy of internal audits is influenced by timeliness, flexibility, reliability, and integration. Significant relationships between these parameters and the degrees of internal audit were found by statistical research. The study's recommendations, which are based on the findings, are as follows: Improve the promptness of audit procedures; Ensure that reporting and audit processes are finished on time. These are ways that pharmaceutical companies can improve the effectiveness of their internal audits. Establishing efficient communication lines and real-time monitoring systems can help cut down on delays. This will make it possible to find problems and fix them faster.

Keywords: Accounting Information Systems, Internal Audit Effectiveness.

INTRODUCTION

In recent years, global advancements have rapidly transformed various facets of life, driven primarily by the widespread integration of information technology. This technological expansion has permeated diverse sectors, including industry, environmental conservation, and commerce, becoming indispensable for managing extensive information, fortifying organizational infrastructures, and efficiently handling financial data to fulfill daily operational requirements (Wibisono & Setyohadi, 2017, Mertins, & White Lourdes, 2018).

The influence of computing has extended across numerous domains, adapting to the dynamic landscape and presenting new possibilities. Recognizing the significance of information technology, particularly in the realm of computerized accounting, organizations have enthusiastically adopted and implemented automated systems. This shift has resulted in the streamlining of various accounting processes, simplifying the day-to-day operations of businesses. (Trigo et al., 2016).

The utilization of computerized information systems, especially in the context of computerized accounting, has revolutionized operational procedures. Manual efforts have been significantly reduced, and costs minimized as software and systems designed for routine tasks now manage daily transactions, expenses, and revenues. What were once intricate accounting and administrative operations have evolved into automated processes executed by computers with precision and efficiency. (Fitriati et al., 2017), (HA, V. D, 2020)

The internal audit function assumes a pivotal role in this context, focusing on evaluating and ensuring the safety and accuracy of financial statements. It plays a crucial role in verifying the integrity of financial transactions and adherence to established policies, aiming to prevent any irregularities that could compromise the company's financial information's integrity and reliability (Almaliki, O et al., 2017), (Alzeban, A., 2014).

However, the integration of accounting information systems introduces a nuanced dynamic to the internal audit function. This study delves into the impact of implementing accounting information systems on improving internal audit effectiveness, with a specific focus on Jordanian pharmaceutical companies. By examining this context, we aim to uncover insights into how the adoption of technology influences the internal audit processes

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within a sector known for its regulatory intricacies and financial complexities. Through an applied study, we seek to provide valuable findings that contribute to the broader understanding of the synergies between accounting information systems and internal audit functions in enhancing financial governance and accountability.

Research Objectives

This study aimed to identify *The Impact of Implementing Accounting Information Systems on Improving Internal Audit Effectiveness: An Applied Study on Jordanian Pharmaceutical Companies*. To achieve the research aim, the current study seeks to accomplish the following specific objectives:

Identify the impact of timeliness on Internal Audit within Jordanian Pharmaceutical Companies.

Identify the impact of Flexibility on Internal Audit within Jordanian Pharmaceutical Companies.

Identify the impact of Reliability on Internal Audit within Jordanian Pharmaceutical Companies.

Identify the impact of Integration on Internal Audit within Jordanian Pharmaceutical Companies.

Literature Review and Research Model

Conceptual Framework on Accounting Information Systems and Internal Audit

According to Hunton (2002), the accounting system is the main source of quantitative information in any commercial organization. He highlights that it accomplishes three key goals:

Planning and Controlling with Internal Reports: The accounting system gives managers access to internal reports that are crucial for organizing and managing different organizational functions.

Using Internal Reporting to Support Non-routine Decision Making and Policy Formulation: Managers use the accounting system to support internal reporting, which helps them create important plans and policies as well as non-routine decisions.

External Reporting to Stakeholders: In order to report externally to parties like investors, the government, and other outside parties, the accounting system is also essential.

Hunton emphasizes the importance of managerial contributions, highlighting accounting's pivotal function in business organizations' information systems and highlighting the wide range of users and benefactors of this type of derived information.

The examination of the Accounting Information Systems (AIS) and the quality of internal audit has garnered considerable attention in prior research (Abdelahi, Arumugam, & Suppiah, 2020; Al-Okaily, Shiyab, & Masadah, 2020; White, Bailey, & Asenova, 2020). Previous literature has delineated the interconnections among the research constructs.

AIS, encompassing systems that undertake data collection, processing, classification, and reporting of financial activities, serves to furnish pertinent information for maintaining outcomes, guiding knowledge, and facilitating decision-making (Brandas, Megan, & Didraga, 2015). The qualitative characteristics of accounting documents can be preserved through the establishment of a successful internal audit framework. A well-functioning audit control system enables company management to utilize more positive information, ensuring the correct execution of business practices and evaluating organizational efficiency (Turner, Weickgenannt, & Copeland, 2020).

The primary role of internal audit involves overseeing the financial reporting process and AIS frameworks provide substantial support in this regard (Trigo, Belfo, & Estébanez, 2016). Previous studies in the context of the relationship between AIS and internal audit quality have consistently demonstrated that AIS exerts a significant impact on internal audit quality (Almaliki, Rapani, Khalid, & Sahaib, 2019; Ogundana, Ojeka, Ojua,

& Nwaze, 2017; Rapani & Malim, 2018). Consequently, it has been established that AIS plays a profound role in influencing the effectiveness of internal audit and internal control mechanisms within organizations.

Correlation between Internal Audit Effectiveness and Accounting Information System

Numerous researchers are currently exploring the correlation between the effectiveness of Internal Audit Systems (IAS) and Accounting Information Systems (AIS), examining their impact on various organizational departments in terms of performance and goal achievement. Overall, AIS and Information Technology (IT) play a significant role in enhancing control effectiveness within organizations and their internal audit processes (Moorthy et al., 2011).

Alrabei, A.M. (2021) the main aim of this study is to explore how Accounting Information Systems (AIS) contribute to enhancing the efficiency of Internal Control in Jordanian Commercial Banks. The results indicate a significant positive relationship between different dimensions of AIS, such as relevance, reliability, timeliness, understandability, completeness, and verifiability, and the effectiveness of Internal Control.

bu Shaiba and Saeed (2018) conducted a study with the objective of determining the impact of Accounting Information Systems (AIS) on the efficacy of internal audits in Libya. Their analysis revealed a positive correlation between the use of AIS and the effectiveness of the audit process. Moreover, the study emphasized the importance of implementing protective measures to mitigate the risks associated with the use of AIS in Libyan Central Bank Systems (CBS).

Neogy (2014) emphasized that an organization equipped with an efficient internal audit system tends to uphold the qualitative features of accounting information. Furthermore, a robust audit control mechanism empowers the management to utilize information with greater confidence, facilitating appropriate business decisions and enabling the measurement of organizational success. Tan's (2016) study on the influence of AIS on internal auditors in Turkey highlighted the pivotal role of internal audit in the transaction process of financial reports, with the AIS system aiding in task completion.

Internal auditors leverage AIS to detect, evaluate, categorize, assemble, record, review, and report occurrences, contributing to the achievement of their objectives. Ciuhureanu (2016) asserted that internal audits enhance the certification of accounting information by ensuring records compliance and evaluating the sufficiency and utilization of internal controls in the accounting domain. Internal audits also serve to prevent accounting fraud, certify the reliability of accounting information, mitigate the risk of accounting errors, enhance the efficiency of recorded accounting transactions, conduct SWOT analyses of accounting activities, and monitor the entire management system.

Mndzebele, N. (2013) conducted a study to investigate the significance of accounting information systems in enhancing internal controls within the hotel industry. Employing a quantitative methodology, the research unveiled a positive correlation between AIS and internal controls. The findings suggested that the implementation of AIS played a crucial role in fortifying internal controls, ultimately enabling hotels to successfully achieve their objectives. The effectiveness of these internal controls was instrumental in facilitating the accomplishment of goals within the hotel sector.

Sambasivam and Assefa (2013) conducted a study to assess the influence of accounting information systems on Ethiopian Manufacturing Industries. Through a survey involving professionals, their findings indicated that accounting information systems play a crucial role in enhancing the quality of financial reports. Additionally, the research highlighted that the effectiveness of internal control systems is positively influenced by the design of the accounting information systems. In summary, the study underscored the significance of accounting information systems in improving financial reporting quality and strengthening internal control mechanisms within Ethiopian Manufacturing Industries.

Research Gaps

The integration of Accounting Information Systems (AIS) has become increasingly prevalent in modern business environments, aiming to enhance organizational processes and effectiveness. This study delves into the specific context of Jordanian pharmaceutical companies, investigating the impact of implementing AIS on

internal audit effectiveness. While there has been some research in this area, a comprehensive review highlights several gaps that warrant further exploration.

Limited Focus on the Pharmaceutical Sector: Existing literature tends to offer a broad perspective on Accounting Information Systems (AIS) and internal audit effectiveness, with minimal emphasis on industry-specific insights. This study aims to address this gap by narrowing its focus to the pharmaceutical sector in Jordan.

Inadequate Examination of Contextual Dimensions The success of AIS implementation and its impact on internal audit effectiveness can be influenced by various contextual Dimensions. This study seeks to identify and analyze these Dimensions within the unique business environment of Jordanian pharmaceutical companies.

Lack of Longitudinal Studies: The majority of existing research focuses on the immediate impact of AIS implementation. This study aims to identify the gaps related to the absence of longitudinal studies, exploring the sustained effects and evolving dynamics over an extended period.

Limited Quantitative Analysis: While some studies have provided qualitative insights, a quantitative approach is essential for a more comprehensive understanding of the causal relationships between AIS implementation and internal audit effectiveness. This research aims to bridge this gap by incorporating robust quantitative methodologies.

By addressing these identified gaps, the study aims to contribute to the existing body of knowledge on the impact of implementing AIS on internal audit effectiveness, offering valuable insights for both academic researchers and practitioners in the field.

Conceptual Framework

As illustrated in Figure 1, the proposed conceptual framework assesses two key variables within this study: the accounting information system and the effectiveness of internal audit.

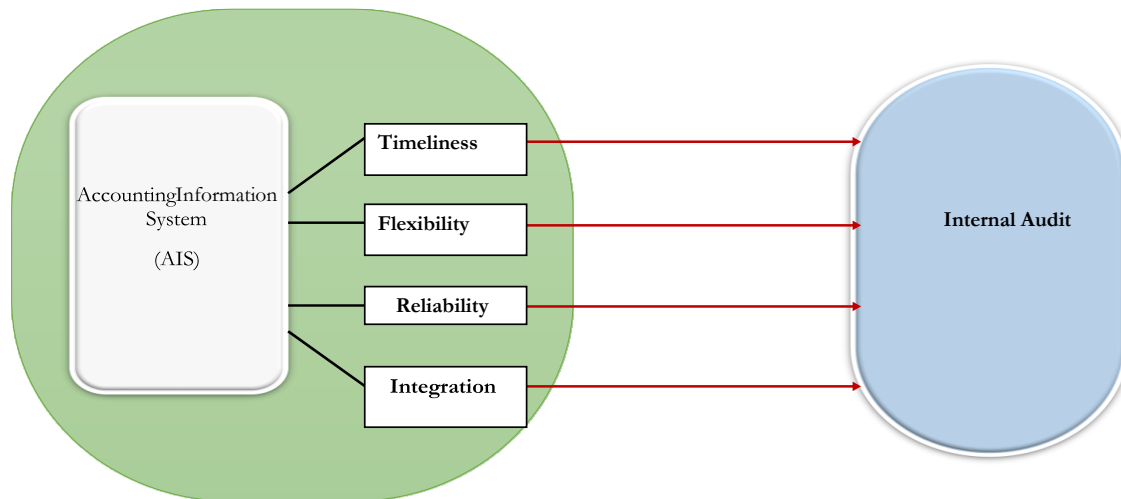


Figure 1: Conceptual Framework

Research Hypotheses

H1: The Timeliness does not exert a positive influence on Internal Audit within Jordanian Pharmaceutical Companies.

H2: Flexibility does not exert a positive impact on Internal Audit in Jordanian Pharmaceutical Companies.

H3: Reliability does not exert a positively to Internal Audit in Jordanian Pharmaceutical Companies.

H4: Integration does not exert a positive effect on Internal Audit within Jordanian Pharmaceutical Companies.

Methodology

Study Population and Sample:

The study population consisted of six companies that are listed on the Amman Stock Exchange and are in the business of manufacturing pharmaceuticals for human use in Jordan (Amman Stock Exchange, 2022). The following justifies the selection of this industry as the study population:

The pharmaceutical industry in Jordan, which produces medications for humans, is a major contributor to the country's GDP. It is essential to supplying the population' pharmacological demands.

This industry is growing significantly as a result of the rising demand both domestically and internationally for pharmaceutical products made in Jordan. The industry is known for its innovation and fierce domestic and global rivalry, which pushes businesses to concentrate on quality, originality, and gaining a competitive edge.

The information was gathered by consulting scholarly publications and references that supported the development of the scale and the fictitious research model. The dimensions of the study problem, the formation of the theoretical framework, and the necessary data collection were all aided by these sources. The process of collecting primary data involved creating a scale in the form of a questionnaire and distributing it to middle and senior management personnel at Jordanian pharmaceutical enterprises.

The study sample received 350 questionnaires in total. 310 of these were returned. Twenty of the returned questionnaires were deemed invalid for analysis because of missing information, according to an examination of the forms. Hence, 290 valid surveys, or 80% of the total disseminated questionnaires, were included in the analysis.

Validity and Reliability of the Study Tool

The reliability of the study tool's content has been affirmed through its presentation to a group of experienced and qualified faculty members. This step aimed to gather their insights across different fields of study, ensuring that each paragraph is relevant to its respective area. Consequently, the study tool, comprising 25 paragraphs distributed among five fields, has reached its final form. To assess the stability of the study tool, it was divided into seven fields to gauge the strength of each section and the overall reliability. The Cronbach Alpha, a test for internal consistency, was employed to analyze the responses from the study sample. The interpretation of the Cronbach Alpha revolves around its indication of internal stability among responses. A statistically acceptable value for this scale is typically set at 60% or more, as suggested by Sekaran and Bougie (2013). However, in some studies, a higher threshold of 70% or more is considered acceptable.

Upon analyzing the data, as presented in Table No. (1), it is evident that the stability of the study items' results is high. This suggests that the study tool is reliable and internally consistent, meeting or exceeding the statistically acceptable thresholds established in the literature.

Table)1(Internal consistency factor (cronbach alpha)

Model	No of Items	Factor (Cronbach Alpha)
Timeliness	5	86.2
Flexibility	5	87.3
Reliability	5	87.2
Integration	5	90.1
DV: Internal Audit	5	85.1

Total	25	87.18
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The table above indicates that the Cronbach alpha coefficients for all items are consistently high, reflecting a strong internal consistency within the study instrument. The stability of the study items is also noteworthy, with a robust overall value of (87.18). This suggests a high level of reliability and credibility for the study tool, reinforcing its effectiveness in measuring the intended constructs.

FINDINGS AND DISCUSSION

Descriptive Statistics

The descriptive data for internal audit effectiveness and accounting information systems are shown in Table (2). With a standard deviation of 0.857 and a mean score of 3.90 for timeliness, businesses typically use highly level of timeliness. With a standard deviation of 0.76 and a mean score of 3.88 for flexibility, the organizations generally implement flexibility highly.

With a standard deviation of 0.70 and a mean score of 3.86 for reliability, the companies generally utilize reliability highly. The mean score for Integration is 3.84, with a standard deviation of 0.833, indicating that the companies typically apply Integration highly. The mean score for Internal Audit Effectiveness is 3.83, with a standard deviation of 0.70, indicating that the companies typically apply Integration highly.

Table (2) (Descriptive Statistics for Accounting Information Systems and Internal Audit Effectiveness

Measure	Mean	Standard Deviation
Timeliness	3.90	0.857
Flexibility	3.88	0.76
Reliability	3.86	0.70
Integration	3.84	0.833
Total	3.87	0.88
Internal Audit Effectiveness	3.83	0.70

Hypothesis Testing

To verify the hypotheses' correctness, the correlation coefficient between accounting information system and Internal Audit. Multiple regressions have been used in this study to test the relationships mentioned above.

Table (4) multiple regressions for accounting information system In Internal Audit

	B	F	(R2)	(R)	Sig
Timeliness in Internal Audit	0.502	101.039	0.485	0.426	0.000
Flexibility in Internal Audit	0.768	348.329	0.435	0.657	0.000
Reliability in Internal Audit	0.714	362.930	0.445	0.668	0.000
Integration in Internal Audit	0.816	437.356	0.490	0.701	0.000

Table 4 depicts the influence of Timeliness on Internal Audit. The results of the statistical analysis reveal a significant impact of Timeliness on Internal Audit, with a correlation coefficient (R) of 0.426 at a significance level of 0.05 (α). The determination coefficient (R2) is 0.485, signifying that 48% of the variations in the Internal Audit level can be attributed to variations in Timeliness.

In a similar vein, the statistical analysis shows that flexibility has a notable effect on internal audit. At a significance level of 0.05 (α), the correlation coefficient (R) is 0.657 and the determination coefficient (R2) is 0.435. This suggests that changes in Flexibility can explain 43% of the disparities in Internal Audit level.

Additionally, the statistical study demonstrates that reliability has a significant impact on internal audit, with a correlation coefficient (R) of 0.668 at the 0.05 (α) significance level. With a determination coefficient (R²) of 0.445, it can be concluded that differences in reliability account for 44% of the variances in internal audit level. Furthermore, the statistical analysis's findings, which show a correlation coefficient (R) of 0.701 at a significance level of 0.05 (α), highlight the important influence of integration on internal audit. 49% of the fluctuations in Internal Audit level can be attributed to variations in Integration, according to the determination coefficient (R²) of 0.490. The findings suggest that there are noteworthy associations between internal audit effectiveness and timeliness, flexibility, reliability, and integration. For instance, the correlation coefficient (R) for timeliness is 0.426, whereas the correlation coefficients for flexibility, reliability, and integration are 0.657, 0.668, and 0.701, respectively. According to the determination coefficients (R²) for these characteristics, changes in timeliness, flexibility, dependability, and integration can account for 43–49% of the variances in internal audit levels.

Relationship between Accounting Information System and Internal Audit Effectiveness: AIS and internal audit efficacy have been studied by the aforementioned researchers (Alrabei, bu Shaiba and Saeed, Neogy, Tan, Ciuhureanu, Mndzebele, Sambasivam, and Assefa). A positive correlation was seen by Alrabei in his research of Jordanian Commercial Banks between the efficacy of internal control and a number of AIS criteria, including completeness, verifiability, relevance, timeliness, and understandability. However, AIS utilization and audit process performance were found to positively correlate in Shaiba and Saeed's Libyan study.

Integration and Effectiveness of Internal Audits: this study conclusions about the relationship between integration and effectiveness of internal audits are consistent with Sambasivam and Assefa's research on Ethiopian Manufacturing Industries. According to their research, internal control system efficacy is positively impacted by the architecture of accounting information systems. The significance of system integration for enhanced internal control and higher-quality financial reporting is emphasized in both studies.

The results of this investigation on timeliness, flexibility, reliability, and integration are consistent with the body of research that highlights the critical function that AIS plays in augmenting the efficacy of internal audits. The elements you researched increase our understanding of how these components affect internal audit procedures. The study's favorable association adds credence to the body of research that highlights the function of AIS in enhancing internal control, averting fraud, and raising the standard of financial reporting overall.

To sum up, the findings of this study on timeliness, flexibility, dependability, and integration are consistent with the body of research that has been done on the relationship that exists between AIS and internal audit effectiveness. The combined results provide to a deeper comprehension of the variables affecting internal audit procedures and how they relate to AIS.

CONCLUSION

The study that was presented has shed important light on how internal audit effectiveness is impacted by timeliness, flexibility, reliability, and integration. Significant correlations between these characteristics and internal audit levels were found by statistical analysis; these relationships were demonstrated by determination coefficients (R²) ranging from 0.435 to 0.490 and correlation coefficients ranging from 0.426 to 0.701. These findings imply that variations in timeliness, flexibility, reliability, and integration account for 43–49% of the variances in internal audit levels.

The results are consistent with the body of research showing that Accounting Information Systems (AIS) and internal audit effectiveness are positively correlated. The result specifically supports earlier studies showing the significance of AIS dimensions—such as completeness, verifiability, understandability, relevance, reliability, and timeliness—in boosting the efficacy of internal controls. Furthermore, the favorable relationship shown between integration and the efficacy of internal audits is in line with prior research highlighting the contribution of integrated systems to enhanced internal control and higher-quality financial reporting.

Overall, the relationship between the study's findings and the larger body of literature emphasizes how important AIS is to maintaining internal controls, thwarting fraud, and raising the standard of financial reporting. The integrated findings highlight the importance of timeliness, flexibility, reliability, and integration and contribute to a more thorough understanding of the elements driving internal audit procedures. This study

underscores the significance of taking these aspects into account for firms looking to maximize the efficacy of their internal audits and contributes insightful new information to the body of existing knowledge.

Recommendations

The study's recommendations for pharmaceutical corporations to improve the efficacy of their internal audits are based on the findings.

Boost the promptness of audit procedures: Make ensuring that reporting and audit processes are completed on time. Reduce delays by putting in place effective communication channels and real-time monitoring technologies. This will enable issues to be identified and resolved more quickly.

Boost Flexibility in Audit Practices: Use adaptable auditing techniques that may be used to evolving internal procedures and regulatory needs. Update audit procedures and strategies often to take into account new compliance requirements and handle new risks.

Boost Audit System Reliability: To guarantee the precision and coherence of audit results, make investments in strong audit management systems and auditor training. Make use of sophisticated data analytics to improve the dependability of audit procedures and results.

To enhance departmental integration: Encourage improved coordination between the audit division and other divisions, including finance, risk management, and compliance. To guarantee thorough coverage of audit activities and to take use of shared insights and data, encourage cross-departmental collaboration.

Leverage Data for Continuous Improvement: Utilize internal audit data to motivate ongoing operational improvements. Examine audit results to detect systemic problems and put corrective measures in place. To improve overall effectiveness, regularly examine and improve audit procedures using data-driven insights.

Pharmaceutical businesses can greatly increase the efficacy of their internal audits and, as a result, improve compliance and operational efficiency by using these guidelines.

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