Journal of Infrastructure, Policy and Development 2024, 8(8), 5806.
https://doi.org/10.24294/jipd.v8i8.5806

Article

Harnessing artificial intelligence to strengthen financial reporting quality in developing economies: A mediated model with internal controls in Jordanian banks

Bilal Al Omari*, Munther Al-Nimer

Accounting Department, Business school, The Hashemite University, Zarqa 13133, Jordan
*** Corresponding author:** Bilal Al Omari, bilalomare8991@gmail.com

CITATION

Al Omari B, AL-Nimer M. (2024). Harnessing artificial intelligence to strengthen financial reporting quality in developing economies: A mediated model with internal controls in Jordanian banks. Journal of Infrastructure, Policy and Development. 8(8): 5806. https://doi.org/10.24294/jipd.v8i8.5806

ARTICLE INFO

Received: 15 April 2024
Accepted: 21 May 2024
Available online: 29 August 2024

Abstract: Objectives: This research aimed to empirically examine the transformative impacts of Artificial Intelligence (AI) adoption on financial reporting quality in Jordanian banking, with internal controls as a hypothesized mediation mechanism. **Methodology:** Quantitative survey data was collected from 130 bank personnel. Multi-item reflective measures assessed AI adoption, internal controls, and financial reporting quality—structural equation modelling analysis relationships between constructs. **Findings:** The research tested four hypotheses grounded in agency and contingency theories. Confirmatory factor analysis demonstrated sound measurement models. Structural equation modelling revealed that AI adoption significantly transformed financial reporting quality. The mediating effect of internal controls on the AI-quality relationship was supported. Specifically, the path from AI adoption to quality was significant, indicating a positive impact. Despite internal controls strongly predicting quality, its mediating effect significantly shaped the degree of transformation driven by AI adoption. The indirect effect of AI on quality through internal controls was also significant. Findings imply a growing diffusion of AI applications in core financial reporting systems. **Practical implications:** Increasing AI applications focus on holistically transforming systems, reflecting committing adoption. Jordanian banks selectively leverage controls to moderate AI-induced transformations. **Originality/value:** This study provides essential real-world insights into how AI is adopted and impacts the Jordanian banking sector, a key player in a fast-evolving developing economy. By examining the role of internal controls, it deepens our understanding of how AI works in practice and offers practical advice for integrating technology effectively and improving information quality. Its mixed methods, unique context, and focus on AI's impact on organizations significantly enrich academic literature. **Recommendations:** Banks should invest in integrated AI architectures, strategically strengthen critical controls to steer transformations, and incrementally translate AI innovations into core processes.

Keywords: artificial intelligence; internal controls; financial reporting quality; Jordanian banking

1. Introduction

The emergence of Artificial Intelligence (AI) stands as a watershed moment in contemporary economic landscapes, promising transformational changes across diverse sectors. Within the intricate banking domain, AI is a potent force with the potential to significantly influence the Accounting Information Quality (AIQ), a linchpin of informed decision-making (Kieso et al., 2019). However, the scholarly exploration of the intricate relationship between AI adoption and AIQ is conspicuously underrepresented in the literature, particularly in the context of developing economies. This research aims to address this glaring gap in the academic discourse by embarking

on a rigorous and comprehensive inquiry into the multifaceted interplay between AI and AIQ within the dynamic and evolving landscape of the Jordanian banking sector. Furthermore, it seeks to introduce an additional dimension to this inquiry, delving into how internal controls mediate the effects of AI adoption on AIQ. In doing so, our research endeavors to provide a holistic understanding of the intricate AI-AIQ relationship. The contextual relevance of Jordan to this inquiry is underscored by its burgeoning banking sector, marked by the increasing assimilation of AI technologies. However, the academic discourse in Jordan has thus far provided limited empirical insights into how AI influences AIQ and its subsequent impact on performance outcomes (Alawaqleh, 2021). As competition intensifies, Jordanian banks find themselves in a pressing need for high-quality accounting information to chart their strategic courses adeptly. It is, however, imperative to acknowledge that the efficacy of AI in enhancing AIQ is contingent upon a resilient and effective internal control environment, a facet characterized by its share of challenges and variations (Zhang and Hou, 2019). Consequently, our research assumes critical significance in offering timely insights into whether the integration of AI technologies bolsters internal control practices, thereby augmenting AIQ within the specific context of Jordanian banking.

This research fundamentally aligns with the broader academic imperative to critically evaluate the financial reporting implications of AI (Zhu and Shen, 2021). Beyond this, it extends its purview to furnish empirical evidence on how AI, as a transformative technology, permeates financial and organizational dimensions. This inquiry seamlessly integrates with the current academic discourse's call for comprehensive investigations into how emerging technologies, such as AI, redefine accounting practices, particularly within developing economies' complex and evolving landscapes (Askary et al., 2018). Given these considerations, Jordan presents an apt and compelling research environment with its dynamic banking milieu characterized by diverse internal control practices and varying paces of AI adoption among different banks. Consequently, the insights emanating from our research possess the potential to transcend the confines of the Jordanian context. They offer invaluable guidance with broader implications, not only for Jordanian banks but also for their counterparts in other developing economies. These insights, geared toward refining technology integration strategies and enhancing internal control frameworks to optimize AIQ, promise to confer a substantial and enduring competitive advantage. The research makes three pivotal contributions to the academic dialogue. Firstly, it undertakes an empirical exploration of AI's role in shaping AIQ, thus addressing a glaring gap in the literature and aligning squarely with the clarion call for investigations into AI's impact on the domains of assurance and accounting (Zhu and Shen, 2021). Secondly, it generates novel evidence regarding how AI, when prudently integrated, interfaces with internal controls and AIQ, particularly within the intricate tapestry of a developing economy. Lastly, it proffers actionable insights and practical implications that can guide Jordanian banks and their peers in other developing economies as they navigate the complex terrain of technology adoption and internal control optimization to enhance AIQ and, by extension, their competitive standing. In this research, the Agency Theory will shed light on the alignment of interests between stakeholders, such as shareholders and managers, and how AI adoption and internal controls may mitigate agency problems in the banking sector, ultimately affecting

accounting information quality. Agency Theory offers a relevant theoretical lens to analyze the dynamics within Jordanian banks and their efforts to ensure the accuracy and transparency of financial information, especially in the context of AI integration and internal control mechanisms. In summation, this research endeavor is not merely an intellectual pursuit but rather a pragmatic undertaking with the potential to shed light on the multifaceted implications of AI within the banking sector, laying a robust foundation for future investigations to delve deeper into AI's far-reaching ramifications within the broader global financial ecosystem.

2. Literature review and hypotheses development

2.1. Summary of literature review

Artificial intelligence (AI) has emerged as a transformative force within the accounting profession, significantly impacting efficiency, accuracy, and the overall quality of financial information. Studies by Hamadneh et al. (2021) and Odoh et al. (2018) have underscored AI's potential to enhance accounting operations and improve the quality of accounting information through the integration of expert systems and intelligent agents (Askary et al., 2019; Odoh et al., 2018). However, the impact of AI on management types and reporting quality may be limited in specific contexts, as highlighted by Hamadneh et al. (2021). Moreover, the effectiveness of AI and accounting information systems is contingent upon technological capabilities and organizational integration (Al-Dalabih, 2018; Fitriati et al., 2020).

Beyond AI advancement, internal control systems and organizational culture have been identified as critical factors influencing financial information quality and performance (Ngo et al., 2021; Setyaningsih et al., 2021). Research by Ngo et al. (2021) in Vietnamese manufacturing enterprises demonstrated that strong control environments and effective internal control procedures positively impact accounting information quality. Similarly, accounting control systems play a pivotal role in enhancing the quality of financial information and fostering firm success, mediating the relationship between control systems and value creation (Phomlaphatrachakom, 2020). These findings underscore the complex interplay between Al and control systems in shaping accurate and reliable financial data, reflecting a significant paradigm shift in accounting practices and evaluations (Al Natour, 2021; Taguimdje et al., 2020). **Table 1** provides a comprehensive overview of these perspectives, including the diverse methodologies employed to explore harnessing artificial intelligence to strengthen financial reporting quality in developing economies: A mediated model with internal controls.

Table 1. Main studies on artificial intelligence, quality of accounting information and internal control.

#	Author	Title	Study variables	Country	Study tool	Findings
1	(Hamadneh et al., 2021)	The Effect of Artificial Intelligence (AI) on the Quality and Interpretation of Financial Statements in the Hotels Classified in the AQABA Special Economic Zone (ASEZA)	Efficiency and effectiveness of artificial intelligence systems. Integration and interdependence of the accounting system. The accuracy of the accounting system. Quality of interpretation and presentation of accounting information.	Jordan	Questionnaire	The findings show that there is no impact of AI on the type of management and the quality of reports in the accounting information implemented in hotel industry.
2	(Askary et al., 2019)	Artificial Intelligence and Reliability of Accounting Information	AI and IC Systems. Information Reliability	-	-	Provide a practical model of using Artificial Intelligence to be implemented for producing quality accounting information via mitigating weakness of internal control in every industry
3	(Taguimdje et al., 2020)	Influence of Artificial Intelligence (AI) on Firm Performance: The Business Value of AI-based Transformation Projects	IT Capabilities Artificial Intelligence and Business Activities	Global	Case studies	Institute can improve the business value of their changed initiatives by expanding on these AI qualities. The same findings revealed that enterprises attain performance when their characteristics/ technologies are used to reorganize their processes through AI capabilities.
4	(Al-Bishtawi and Al-Baqmi, 2015)	The impact of the application of expert systems in commercial banks on electronic audit procedures, from the viewpoint of public accountants: a comparative study in The Hashemite Kingdom of Jordan and Saudi Arabia	For the independent variable (expert systems): the quality of the expert systems applied in commercial banks, requirements for the application of expert systems in commercial banks Dependent variable: (electronic audit procedures)	The Hashemite Kingdom of Jordan and Saudi Arabia	Questionnaire	The importance of expert systems in commercial banks in facilitating electronic audit procedures, such as speed in carrying out tasks and obtaining data and information necessary to express an opinion about the bank's services and their conformity with international accounting and auditing standards
5	(Al Natour, 2021)	The Impact of Information Technology on The Quality of Accounting Information (SFAC NO 8, 2010)	Information technology and accounting applications. The quality of accounting information. Qualitative Characteristics of Useful Financial Information	Saudi Arabia	Questionnaire	According to the research, the greatest technical effects on accounting applications are speed flexibility, accuracy, and consideration followed by relevance and faithful representation in fundamental features altered by employing technology.
6	(Odoh et al., 2018)	Effect of Artificial Intelligence on the Performance of Accounting Operations among Accounting Firms in South East Nigeria.	Independent variable: artificial intelligence Dimensions (Expert Systems, Intelligent Agent) Dependent variable: performance of accounting operations	South East Nigeria.	Questionnaire	The study's findings revealed that expert systems and intelligent agents have a significant impact on the accounting function performance of public accounting firms in Southeast Nigeria. It was determined that the use of AI improves the performance of accounting systems.

Table 1. (*Continued*).

#	Author	Title	Study variables	Country	Study tool	Findings
7	(Fitriati et al., 2020).	The Role of AIS Success on Accounting Information Quality	System quality Accounting Information System Success System quality	The Regional Government of Kebumen Regency	Questionnaire	According to the findings, Accounting Information system (AIS) success can be measured using metrics of perceived usefulness, perceived ease of use, and information system usage. Integrated information systems (both across components and sub-systems) improve user views of the system's usefulness and simplicity of use.
8	(Al-Dalabih, 2018)	The Impact of the Use of Accounting Information Systems on the Quality of Financial Data	The independent variable: the use of accounting information systems in its dimensions, the nature of accounting information systems, the inputs of accounting information systems, the dependent variable: the quality of financial statements.	Jordan	Questionnaire	The study's findings are significant among Jordanian service firms in terms of the type, input, and security of accounting systems, as well as the quality of financial information attributed to the firm's industry.
9	(Ngo et al., 2021)	The Relationship Between Internal Control and Accounting Information Quality: Empirical Evidence from Manufacturing Sector in Vietnam	Control environment, accounting information system, and IC procedures	Vietnamese	Questionnaire	According to the findings of the study, three elements have a favorable impact on the quality of accounting information in Vietnamese paper manufacturing enterprises: control environment, accounting information system, and Internal Control (IC) methods.
10	(Setyaningsih et al., 2021)	Implementation and performance of accounting information systems, internal control, and organizational culture in the quality of financial information.	Accounting information systems, Internal Control Organizational culture Quality of financial information performance	Indonesia	Questionnaire and Interview	The findings revealed that the implementation of accounting information systems, IC systems, and organizational culture all have a substantial impact on the quality of financial reports and performance.
11	(Noorand Mansor, 2019)	Exploring the Adaptation of Artificial Intelligence in Whistleblowing Practice of the Internal Auditors in Malaysia	Artificial Intelligence (AI) Practices of Whistleblowing	Malaysia	Questionnaire	In this study, it is demonstrated that the use of AI in whistleblowing methods will result in Malaysian Anti-Corruption Commission (MACC) taking effective and immediate action to resolve corruption complaints.
12	(Phomlaphatrachakom, 2020)	Accounting Control System, Accounting Information Quality, Value Creation, and Firm Success: An Empirical Investigation of Auto Parts Businesses in Thailand	Accounting Control System Accounting Information Quality Value Creation Firm success	Thailand	Questionnaire	According to the findings, accounting control systems have a considerable positive impact on accounting quality of information and value creation. Furthermore, accounting information quality has a large beneficial impact on both value creation and firm performance, and it is an important mediator of the accounting control system-firm success links.

2.2. Artificial intelligence

AI is a branch of computer technology that belongs to the highly effective digital field and allows immediate access to information and effective decision-making in ever-increasing business environments (Awan et al., 2021). Wang (2019) discusses AI whether it create advanced machines can proxy to the environment as well as change the environment with insufficient data. AI is also defined by Grewal (2014) as a programmed that accumulates and consolidates data about the venue or circumstance of a person and takes methods based on that data collected and analyzed. Moreover, artificial intelligence techniques are originally computer systems that were developed to fulfill the task that would have depended on human intelligence (Alex, 2019). The development of human intelligence has resulted in the development of emerging technologies such as the Internet of Things (IoT), data science, big data, cloud computing, AI, and blockchain, which are changing the way we live and work. Furthermore, further advancements in these technologies may contribute to the advancement of automation and superconductivity (Park, 2018).

A certain AI regulatory structure should specify what it modulate. Regrettably, no widely accepted definition of AI appears to exist as of yet, even among scientific experts. In terms of intelligence the late AI pioneer John McCarthy (1989), widely credited with coining the term AI, mentioned that there is "no robust definition of intelligence that does not depend on its association with human intelligence" because cannot yet distinguish commonly what kinds of computational actions humans would want call intelligent.

2.3. Branches of AI

2.3.1. Machine learning

The first step in defining what studies mean by AI and machine learning is outlined by Aziz and Dowling (2019). AI is commonly viewed as machine intelligence, with intelligence defined through reference to what it's see in humans. In practice, AI could include additional techniques regarding machine learning, such as the incorporation of static and Boolean coding rules. Machine learning, on the other hand, typically involves a data scientist manually selecting and testing data, as well as human decisions about how it can apply the reported information. On other perspective ML is defined from the standpoint of intelligence as a computer program that learns from experience designing some task sections and performance indicators, if its performance in tasks, as measured, increases with experience (Ma and Sun, 2020).

According to research, machine learning has a set of tasks, which are as follows:

Reinforcement learning (Sutton and Barto, 2018); Supervised learning and Unsupervised learning (Ma and Sun, 2020); Semi-supervised learning and transfer learning (Zhu, 2005). Machine learning has delved into various characteristics, such as handling unstructured and mixed-format data, managing large volumes of data, implementing flexible model structures, and achieving high prediction performance. These investigations highlight the multifaceted nature of machine learning applications, demonstrating its adaptability to diverse data types and its capacity to process vast amounts of information while maintaining predictive accuracy.

Romov and Sokolov (2015) concentrated on a variety of machine learning

characteristics, including: The capable of handling unstructured and mixed format data and its able to manage large volumes of data, flexible model structure and high prediction performance.

2.3.2. Deep learning

Deep learning (DL) is a branch of machine learning. (Balakrishnan et al., 2020; LeCun, 2015). It has aided in image object recognition, video labeling, and activity recognition, and it is progressing in perception (including audio and speech). A deep learning application developed by Facebook, has been trained to identify people in photos. Many scholars draw parallels between deep learning technology and biology, it is not inevitably modeled after it. Deep learning is a type of machine learning algorithm that has attracted a lot of excitement in academia and industry (Islam et al., 2019).

DL has been used in a wide range of applications, including computer vision, speech recognition, entertainment, gaming, malware detection, fraud detection, education, manufacturing, agriculture, and self-driving cars. As Ahmad et al. (2020) explained, it has the potential to offer significant opportunities for researchers in advanced technology, which led to the provision of big data and computing along with high-capable algorithms.

2.3.3. Expert systems (ES)

During the last decade, there has been a significant increase in interest in the results of AI research, particularly in the field of knowledge-based systems, which is assumed one of the first areas of ai that flourished commercially and drew a lot of attention to it, and in general. The phrase “knowledge-based system” refers to information systems that employ a symbolic representation of applied human knowledge in a way comparable to the human mind (Ali, 2017), until these knowledge-based systems evolved into expert systems of the most effective systems in use today.

Odoh et al. (2018) define expert systems as AI programs adopted in the late twentieth century that attain a degree of professionalism capable of changing human specialization in a specific area of decision-making. Expert systems are easily applied and are the most widespread used AI, a way of thinking experts in a specific field.

In addition, Abdel Nour (2015) described an expert system as a computer program that demonstrates a degree of expertise in addressing issues within a certain subject, and the way of solving problems in this system is similar to the approach intended by the human expert in a particular field. It was concluded in this study from the concept of expert systems is essentially an intelligence-based technique that consists of a knowledge database for all application domains and an inference or reasoning system that solves problems with the same expertise and competence as humans.

Components of expert systems: There are five main parts that make up expert systems, which are knowledge base, inference or inference engine, user interface, clarification unit, and knowledge acquisition method (Njegus, 2013). First, as noted by Abdel Nour (2015) in the knowledge base, this base includes the knowledge required to understand the problems in a specific discipline; it consists of two main elements: facts and rules. Second, the inference or conclusion engine: It performs the

process of inference, formulating results, and attempting to make suggested recommendations using data obtained from the knowledge base during the system development stage and from the end user during the system usage stage (Sekari et al., 2015).

2.4. Mediating variable

The mediating variable refers to the intermediary factor that explains the relationship between the independent variable (internal control procedures) and the dependent variable (AIC). In this case, the mediating variable could be the effectiveness or robustness of the internal control procedures. The effectiveness of internal control procedures influences the quality of accounting information through several mechanisms. Strong internal control procedures ensure the accuracy and reliability of financial data by reducing the likelihood of errors or fraudulent activities. This, in turn, contributes to producing high-quality accounting information. Also, effective internal control procedures provide assurance regarding the integrity and completeness of financial reporting processes. This assurance enhances the confidence of stakeholders in the accuracy and reliability of the accounting information presented by the organization. Additionally, robust internal control procedures facilitate timely and transparent communication of financial information, enabling stakeholders to make informed decisions. This timely and transparent communication enhances the overall AIC by ensuring that relevant information is available when needed. Furthermore, the mediating variable, which is the effectiveness or robustness of internal control procedures, influences the dependent variable, which is the Accounting Information Quality, by ensuring accuracy, reliability, integrity, completeness, timeliness, and transparency in financial reporting processes.

2.5. Internal control

Internal control (IC), defined as a must-do option for entities to increase the level of their internal management, raise their effectiveness and efficiency., and ensure their economic efficiency. Achieving better internal management of the firm through the formulation and implementation of the IC strategy, creating an internal environment with a better level of competition in the enterprise's external market, seizing opportunities from value gains (Zhang and Hou, 2019).

From another perspective, Ngo et al. (2021) defined IC as designed processes that help protect the organization and try to reduce risks to its objectives. ICs are based on protecting property, keeping records, increasing operational efficiency, and motivating adherence to policies, rules, procedures, and laws. In another sense, the IC system is defined as the tool through which management seeks reasonable certainty that appropriate safeguards are in place to protect the firm's property and accounting records (Provasi and Riva, 2015). Thus, the IC system should assist the firm in achieving its goals and pursuing its mission, as well as reduce risks associated with the rapidly changing economic, political, and social context, and reduce risks associated with the potential unreliability of the firm's operating systems, which are responsible for the day-to-day polices and management implement.

2.6. Hypotheses' development

2.6.1. Artificial intelligence and quality of information

Since 2010, AI has grown dramatically, owing primarily to significant advances in computing power and accessibility to vast data amounts (CIGREF, 2018; PWC, 2019), To raise productivity and efficiency and innovate new services, organizations will have to rely more on AI to improve their performance (Crew, 2019). AI enables the assistance of the human mind and its technological development and has helped firms raise the level of data and information exchange between their various units. AI works to approximate human intelligence by means of a computer program that matches human behavior. These programs are distinguished by their intelligence, the speed with which electronic processing operations are performed, and their ability to provide users with the data and information they require to make sound decisions (Hamadneh et al., 2021).

The main objective of the financial information provided by the firm is to enable users to make capital allocation decisions about the firm (Kieso et al., 2019). Information has become an irreplaceable component in the production process of economic units. The results of Thapayom and Ussahawanitchakit (2015) study showed that the accounting information system with its dimensions (accounting system integration, accounting information system interdependence, accuracy of accounting work, AIC interpretation, quality of presentation of accounting information) have a significant positive impact on the achievement of accounting reporting. At the same time, a result in the study of Al-Jaber (2020) showed that there is not a statistically significant impact when using AI on the quality of interpretation of accounting information in Jordanian banks. Therefore, the first hypothesis is:

- HO1: There is no statistically significant impact of Artificial Intelligence on Quality of Information.

2.6.2. Artificial intelligence and internal control

Kahraman et al. (2011) indicated in his study that because AI is a subfield of computer science, AI Techniques have caused a revolution in the world of information technology. AI encompasses the creation of smart devices and programs that work and interact like humans. Almost every IC system's primary goal is to manage risk factors that impede a firm from achieving its strategic goals. Every organization strives to achieve its strategic goals by building, implementing, and maintaining effective and efficient IC systems (Askary et al., 2019), From an important angle, Batallerand Harris (2018) mentioned in today's high-powered technology, AI should assist managers in removing weaknesses in internal controls by recognizing, analyzing, and removing those weaknesses, and then providing final solutions with more accurate and timely remedies before many damages are incurred to the entity. AI can reduce accounting information risk by addressing the weaknesses of IC systems. AI can identify the weakness, comprehend the fundamental problem, and take actions to remove the weakness automatically through a programed expert decision making.

Should vigorously employ AI technologies to aid enterprise development The prevention of risks is one of the primary topics of enterprise internal control, and the use of AI technology can significantly increase the precision and objectivity of financial and audit work, creating favorable circumstances for the development of firm

IC (Zhu and Shen 2021). While Moudud-Ul-Hug (2014) emphasized the need to integrate a number of accounting branches with artificial intelligence, one of these branches is to assess the risks related to IC. Furthermore, the study of (Othman and Jamil, 2012) found that using AI approaches in IC quality had a positive impact. Therefore, the second hypothesis is proposed:

- HO2: There is no statistically significant impact of Artificial Intelligence on Internal Control.

2.6.3. Internal control and quality of information

Financial scandals and allegations of financial fraud that have led to the demise of large organizations in recent years, such as Enron and WorldCom, have revealed flaws in IC mechanisms and cloud information systems. Internal control first appeared in European countries as a role of the external auditor during the eighteenth century, resulting in a concentrate on the financial aspects of the firm's business and activities. Al-Ali et al. (2017) indicate this frailty crops up from their lack of interest in IC and systems. Furthermore, in many firms, a lack of knowledge of its position as an instrument for accomplishing the firm's overall objectives and accessibility to fair and reliable financial statements led to greater attention to the efficiency and robustness of IC systems and accounting systems. According to a Committee of Sponsoring Organizations of the Treadway Commission (COSO), the idea of IC and its aims. The COSO defines IC as the methods used by the Board of Directors (BOD) and administration to offer reasonable assurance (Alslihat et al., 2018).

One of the primary issues in producing low-quality accounting information is a lack of IC procedures. By requiring management and auditors to report on the efficacy of internal controls over the financial reporting component of the firm's management information systems, the Sarbanes-Oxley Act of 2002 emphasizes the relevance of information system controls Elbannan (2009). The legislation's general philosophy on the relationship between an effective corporate governance procedure and a powerful IC system set up an elevated level of auditors' independence to provide precise accounting information. Concerns have been raised about how information technology, specifically artificial intelligence, can improve and enable Sarbanes-Oxley Act of 2002(SOX) policy decision-making., where there are trial models, the first before the SOX law and the other after the implementation of the law (Dufour, 2020). According to the findings of the Phomlaphatrachakom (2020) study, accounting control systems have a considerable favorable effect on AIC and value creation.

In the same context, research of Ngo et al. (2021) results reveal that three aspects, including control environment, accounting information system, and IC procedures, have a significant influence on the Accounting Information Quality in Vietnamese paper manufacturing businesses. Therefore, the third hypothesis is:

- HO3: There is no statistically significant of impact of Internal Control on the Quality of Information.

2.6.4. The mediation role of internal control on the impact of artificial intelligence on quality of information

With the phenomenal evolution of computer science, business intelligence, and analytics technology, the Information and knowledge needed has gradually increased over time. Recent technological advancements have repeatedly shifted the focus to a

crucial model of information science, AI (Cavusoglu, 2019; Naumov, 2019).The association between the concept of AI and the accounting business rules, as well as the intensifying use of online transactions, has become prevalent in the nature of electronic work in most competitive dealings and transactions with individuals and firms (Askary et al., 2018). This can be accomplished by using ai technology to avoid and address complex situations such as a poor internal cash management mechanism, inventory, and so on. Our time witnessed such informational importance that some concepts, such as (the information age, the information revolution, AI), spread to describe the current state of information (Nalukenge, 2012).

According to Butler and Harris (2018) they argue about the asymmetry of AI and internal control together and present a business model for using AI to be applied to generate high AIC by addressing IC flaws in nearly every business. The competency model is characterized by more activities based on rules, procedures and standards that make IC stronger, While the study of Othman and Jamil (2012) focused on the need to pay attention and focus on the use of AI in public shareholding companies to develop internal audit processes.

In terms of accounting information quality, providing significant financial reporting information is critical because it will positively affect capital providers and other stakeholders when making investment, financing, and other resource allocation decisions, thereby improving overall market efficiency (Murphy and O'Connell, 2013). According to Zhang and Hou, (2019), the formulation of the Internal Accounting Control Standards is to improve the authenticity and effectiveness of accounting information, not only to be assumed as the needs of the control department, but also to effectively provide internal management of organizations.

While Al-Samarrai (2016) study found a statistically significant impact of the control environment, information, and communication on the quality of financial reports in the Jordanian pharmaceutical companies listed on the Amman Stock Exchange. Therefore, the Fourth hypothesis is:

- HO4: There is no statistically significant mediation role of Internal Control on the impact of Artificial Intelligence on Quality of Information.

2.7. Overview of the role of artificial intelligence in banks and course on the quality of accounting reports in particular

The study delves into Jordan's banking sector, encompassing both Islamic and commercial banks, which play a pivotal role in the national economy, particularly amidst the challenges posed by the global pandemic. With the emergence of Artificial Intelligence (AI), these banks are leveraging innovative technologies to enhance efficiency, effectiveness, and competitiveness within the financial industry. AI is instrumental in optimizing administrative processes, achieving strategic objectives, and delivering a wide range of financial services to customers. Additionally, AI adoption contributes to the sector's overall performance and growth, aligning with the Central Bank's objectives of maintaining stability and promoting economic growth. The Jordanian banking sector plays a vital role in the nation's economic landscape, contributing to stability and growth. The integration of Artificial Intelligence presents significant opportunities to enhance operational efficiency, customer experiences, and

overall competitiveness. While challenges exist, proactive measures by banks and regulatory bodies can facilitate the seamless adoption of AI-driven solutions, positioning Jordanian banks at the forefront of innovation in the region.

AIC is closely related to how information is used in decision-making to achieve organizational and institutional goals (Fitriati et al., 2020). The full term for financial accounting is the creation and compilation of information that is useful to internal and external decision-makers for organizations. However, for financial information to be useful and beneficial in decision making, it should be understood (Al Natour, 2021). Various previous studies emphasized the significance of financial reporting information relevancy in terms of its role in influencing user decisions, enhancing their capabilities and innovations in decision making (Tomaszewskiandchio, 2018).

The innovative development of technology, which is now being adopted by firms, has been fully realized, so that AI is integrated into most of the activities of institutions because of its positive dimensions that improve the performance of the firm. Firms depend on the existence of many modern technologies according to standards to keep pace with developments, rapid changes, and competition in our time. Nowadays, innovation and development are taking place, in light of the rapid and technological developments changes, AI is no longer traditional, but has become a widespread concern capable of facing problems And the renewed challenges posed by change through an improvement in the quality of information, as the results of the study (Askary et al., 2018) showed that firms that use AI allow them to reduce the level of costs and losses arising from failure to produce reliable accounting information, and enable managers to make a better decision and improve the performance of institutions in general. Achim and Chiş (2014) indicated in defining the quality of information related to financial reports that reflect the quality of financial information completely and transparently with the objective of not misleading or distorting that information provided to investors that helps them make decisions.

2.8. Overview of the quality of accounting reports and how modern technologies affect them, including artificial intelligence

Artificial intelligence (AI) plays a significant role in enhancing the quality of accounting reports by improving various aspects of information generation, processing, and presentation. AI technologies can contribute to the accuracy, completeness, and timeliness of financial data by automating data entry, reconciliation, and analysis processes. Additionally, AI algorithms can help detect errors, anomalies, and trends in financial data, ensuring faithful representation and enhancing the reliability of accounting information. Moreover, AI-powered systems can enhance the relevance of accounting reports by customizing information presentation based on user preferences and providing predictive insights for better decision-making. Overall, integrating AI into accounting information systems can lead to more reliable, relevant, and timely financial reports, thereby improving the overall AIC.

Modern technologies, particularly artificial intelligence (AI), have significantly impacted accounting applications and the quality of accounting information. These advancements have revolutionized fundamental features such as speed, flexibility, relevance, and faithful representation in accounting practices. Expert systems and

intelligent agents, as dimensions of AI, have notably improved the performance of accounting operations, especially within public accounting firms. The success of Accounting Information Systems (AIS) is now measured using metrics such as perceived usefulness, perceived ease of use, and system usage, indicating a shift towards integrated information systems that enhance user perceptions of system utility and simplicity. Moreover, in Jordanian service firms, modern technologies have influenced the type, input, and security of accounting systems, ultimately enhancing the quality of financial information attributed to the firm's industry. Therefore, the integration of AI and other modern technologies continues to shape and improve accounting practices, ensuring more efficient operations and higher-quality financial information for decision-making processes.

3. Materials and methods

3.1. Sample and data collection

The research population comprised all 15 commercial and Islamic banks listed on the Amman Stock Exchange, representing a significant sector of Jordan's financial system. The sample targeted managers, accountants, auditors, IT specialists, and other bank personnel involved in accounting, reporting, controls, and AI adoption. This provided diverse perspectives across roles critical to information quality, internal controls, and AI integration.

Questionnaires were distributed to collect quantitative data assessing the key constructs. After screening, 130 valid responses were obtained, yielding a robust 96.3% response rate. The high response enhances the research's rigour and generalizability across the banking sector. Respondents possessed diverse demographic profiles in age, education, experience, and administrative roles—most held bachelor's degrees with specializations in accounting or business, appropriate given the research's focus. The largest segment (44.6%) had less than five years of experience, reflecting junior personnel's significant responsibilities in executing controls and AI-enabled processes. The sample also incorporated seasoned professionals overseeing reporting, audits, and governance.

3.2. Measures

Multi-item reflective scales adapted from prior studies measured the key constructs. Using established measures enhances validity and ensures constructs are comprehensively captured (Straub et al., 2004).

Artificial intelligence (AI): 15 items assessed critical AI dimensions, including machine learning, deep learning, and expert systems. Measures were adapted from studies examining AI in accounting and assurance contexts (Al-Jaber, 2020; Hamadneh et al., 2021; Rozario and Zhang, 2021).

Internal controls (IC): 22 items measured vital aspects of contemporary control frameworks, including risk assessment, monitoring, control activities, and information flows. Measures were adapted from research on entity-level controls, enterprise risk management, and the COSO framework (Al-Samarrai, 2016; Jayantha, 2018; Romney and Steinbart, 2019).

Information quality: 13 items gauged key quality dimensions, including relevance, reliability, comparability, and understandability. Measures were adapted from studies analyzing AIC (Al-Dalabih, 2018; Kieso et al., 2019).

All scale items used 5-point Likert scales, appropriate for capturing variations in perceptions. The questionnaire demonstrated strong composite reliability (Cronbach's alpha of 0.927) and high dimensional reliability, establishing internal consistency.
The full survey questionnaire used in this study is provided in the Appendix, and as detailed in Appendix, the survey included questions on demographic information, artificial intelligence, quality of accounting information, and internal control.

3.3. Analysis approach

SPSS and SmartPLS 3.3 software were used for statistical analysis. Descriptive analysis profiled the sample and constructs. Correlations and regression models assessed relationships between AI, IC, and information quality. A bootstrapping mediation technique based on Preacher and Hayes (2008) tested the mediating effect of IC on AI and quality. Bootstrapping strengthens causal inference by generating a sampling distribution to assess mediation effects, recommended over the Baron and Kenny (1986) approach. The analysis provides robust insights into AI's impacts on quality and the mediating role of internal controls in the Jordanian banking context.

3.4. Sample and data collection

The research population for this study consists of all commercial and Islamic banks listed on the Amman Stock Exchange, totaling 15 banks. The sample for the study includes various stakeholders within these banks, namely general managers, financial managers, accountants, internal auditors, programmers, and other employees. The sample size was determined through a combination of electronic and paper questionnaires, with a total of 130 valid questionnaires received out of the total distributed questionnaires, resulting in a response rate of 96.3%. The selection of the sample likely involved a combination of random sampling and convenience sampling methods. Random sampling may have been employed to ensure that each bank within the population has an equal chance of being selected for the study. Convenience sampling may have been used to select specific individuals within each bank based on their availability and willingness to participate in the study. Overall, the sample was selected in a manner that aimed to capture a diverse representation of stakeholders from the target population of Jordanian banks, allowing for a comprehensive analysis of the impact of artificial intelligence on the quality of information, with a focus on the mediating role of internal control, The largest segment (44.6%) had less than five years of experience, reflecting junior personnel's significant responsibilities in executing controls and AI-enabled processes. The sample also incorporated seasoned professionals overseeing reporting, audits, and governance.

3.5. Dependent variable developing

The quality of accounting information was developed based on the concepts of information quality as defined in the study. These concepts include attributes such as accuracy, integrity, consistency, completeness, validity, timeliness, accessibility,

relevance, and faithful representation. The indicators were likely created through a process of identifying specific measurable aspects or characteristics within each of these conceptual dimensions. For example, indicators for accuracy may involve assessing the level of error or precision in financial reports, while indicators for relevance may involve evaluating the extent to which the information assists users in decision-making. Additionally, the study may have drawn from existing literature and frameworks in accounting and information quality to inform the development of these indicators. The indicators would then be used as variables to assess the impact of artificial intelligence on the quality of accounting information in the Jordanian banking sector, with internal control serving as a mediating factor in this impact.

4. Results and discussion

The measurement model was evaluated using confirmatory factor analysis. Standardized factor loadings were examined to assess convergent validity. As Stevens (1992) suggested, items with loadings below 0.4 were removed. Additionally, following recommendations by MacCallum et al. (1999), items were removed if their removal improved the average communality above 0.7, indicating an acceptable overall amount of variance explained given the sample size of 130.

The initial measurement model is presented in **Figure 1**. Standardized factor loadings and squared multiple correlations are shown. As seen in **Table 2**, several items showed low factor loadings (<0.5). Specifically, Q2.1.2, Q2.1.3, Q2.4.2, and Q3.1.1 were removed due to low factor loadings below the 0.5 cutoff established based on the sample size.

Figure 1 visually presents the initial measurement model with factor loadings and squared multiple correlations. As shown, several items have low factor loadings that do not meet the 0.5 cutoff established for this sample size.

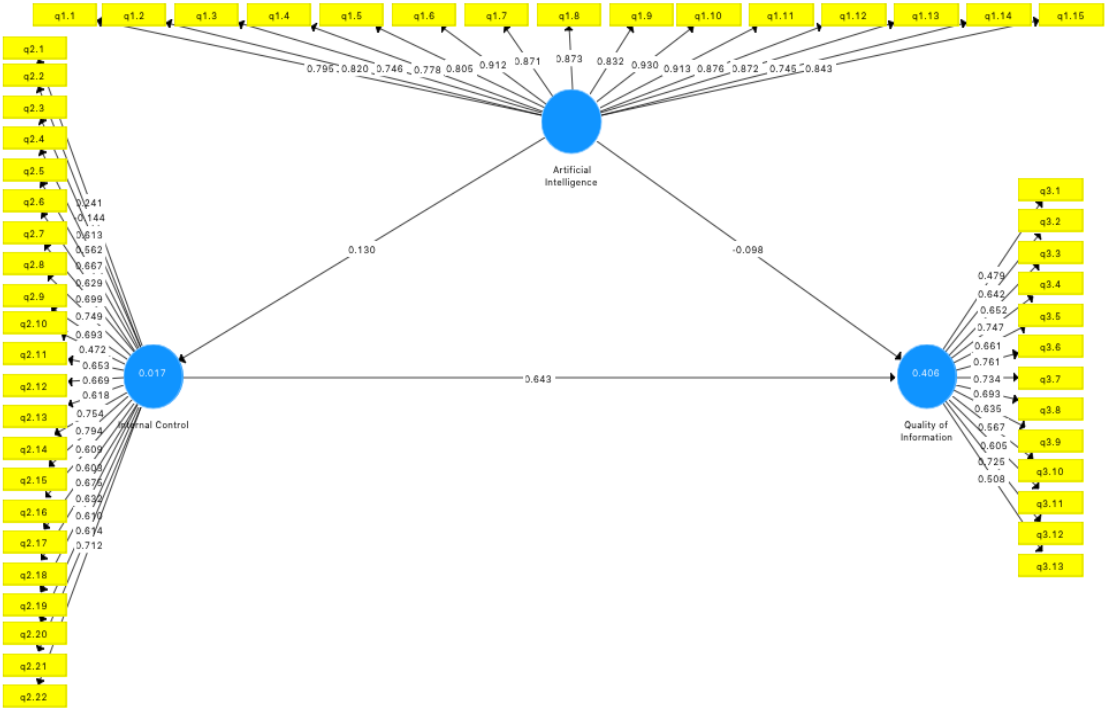

Figure 1. Initial measurement model.

Table 2. Initial standardized factor loadings.

Section	#	Artificial intelligence	Internal control	Quality of information
Artificial intelligence	Q1.1.1	0.795	0.107	0.104
	Q1.1.2	0.82	−0.025	−0.008
	Q1.1.3	0.746	−0.049	−0.110
	Q1.1.4	0.778	−0.039	−0.167
	Q1.1.5	0.805	0.058	−0.022
	Q1.1.6	0.912	0.132	0.008
	Q1.2.1	0.871	0.058	−0.046
	Q1.2.2	0.873	0.070	−0.024
	Q1.2.3	0.832	0.064	0.015
	Q1.2.4	0.93	0.096	−0.047
	Q1.2.5	0.913	0.148	−0.046
	Q1.3.1	0.876	0.083	−0.090
	Q1.3.2	0.872	0.129	−0.030
	Q1.3.3	0.745	−0.012	−0.066
	Q1.3.4	0.843	0.043	−0.032
Internal control	Q2.1.1	0.438	0.241	0.027
	Q2.1.2	0.389	−0.144	−0.176
	Q2.1.3	0.054	0.613	0.326
	Q2.2.1	0.158	0.562	0.342
	Q2.2.2	−0.042	0.667	0.453
	Q2.3.1	−0.017	0.629	0.455
	Q2.3.2	0.056	0.699	0.409
	Q2.3.3	−0.043	0.749	0.512
	Q2.4.1	0.103	0.693	0.278
	Q2.4.2	0.168	0.472	0.233
	Q2.4.3	0.134	0.653	0.316
	Q2.5.1	0.034	0.669	0.417
	Q2.5.2	0.066	0.618	0.320
	Q2.5.3	0.126	0.754	0.468
	Q2.5.4	0.126	0.794	0.525
	Q2.6.1	0.115	0.609	0.464
	Q2.7.1	0.150	0.603	0.292
	Q2.7.2	0.221	0.675	0.413
	Q2.7.3	−0.030	0.632	0.413
	Q2.8.1	0.129	0.61	0.504
	Q2.8.2	0.085	0.614	0.478
	Q2.8.3	0.148	0.712	0.387
Quality of information	Q3.1.1	−0.128	0.259	0.479
	Q3.1.2	0.025	0.480	0.642
	Q3.1.3	−0.065	0.432	0.652
	Q3.1.4	−0.067	0.533	0.747

Table 2. (*Continued*).

Section	#	Artificial intelligence	Internal control	Quality of information
Quality of information	Q3.1.5	0.041	0.408	0.661
	Q3.1.6	0.040	0.504	0.761
	Q3.2.1	−0.016	0.422	0.734
	Q3.2.2	−0.030	0.357	0.693
	Q3.2.3	−0.059	0.317	0.635
	Q3.2.4	0.141	0.363	0.567
	Q3.3.1	−0.118	0.336	0.605
	Q3.3.2	−0.043	0.431	0.725
	Q3.4.1	0.145	0.383	0.508

The removal of four items with low factor loadings improved model fit. The final measurement model is presented in **Figure 2**. The overall average communality increased from 0.65 to 0.71, above the 0.7 benchmark recommended by MacCallum et al. (1999). All remaining items loaded significantly onto their intended factors (loadings > 0.6).

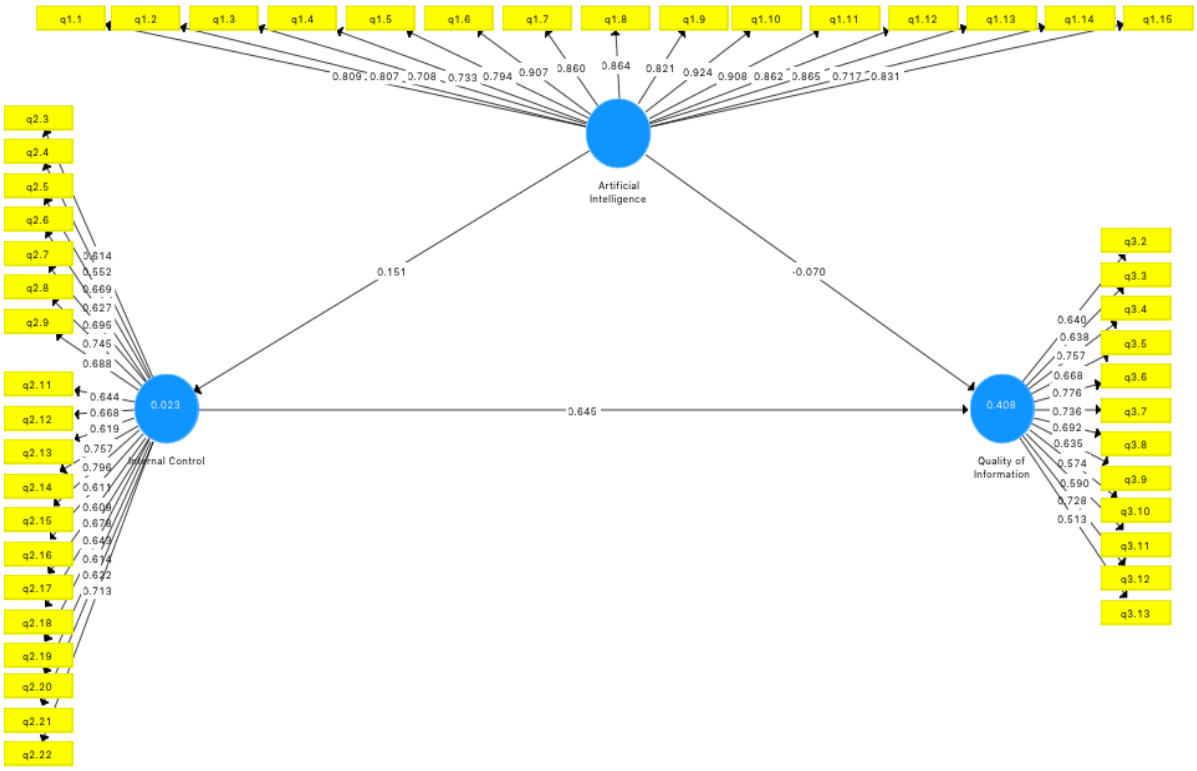

Figure 2. Final measurement model.

This process of removing poor-performing items provides evidence for the convergent validity of the final measurement model. The final model demonstrates strong factor loadings exceeding the established cutoff value. Additionally, the overall explained variance increased to an acceptable level after removing problematic items. This supports the convergent validity of the measures used in this research. Discriminant validity was assessed using the Fornell and Larcker criterion (Fornell

and Larcker, 1981). As shown in **Table 2**, the square root of the AVE for each construct was more significant than its highest correlation with any other construct, supporting discriminant validity.

4.1. Discriminant validity

The CornellL and Criterion, suggested by Fornell and Larcker in 1981, was used to test the discriminant validity (**Table 3**). As all loadings of an indicator on its assigned latent variable were higher than on all other latent variables, the requirement for discriminant validity was fulfilled.

As seen in **Table 3**, each indicator's loading on its assigned latent variable is higher than its loading with other variables. This means the degree to which a measure diverges from (i.e., does not correlate with) another measure whose underlying construct is conceptually unrelated.

Table 3. Fornel and Larcker criterion for discriminant validity.

	Artificial intelligence	**Internal control**	**Quality of information**
Artificial Intelligence	0.843	-	-
Internal Control	0.130	0.628	-
Quality of Information	−0.014	0.530	0.653

4.2. Convergent validity

Convergent validity was evaluated based on composite reliability and average variance extracted (AVE) (Hair et al., 2010). As seen in **Table 3**, composite reliability exceeded 0.6 for all constructs. The AVE was slightly below 0.5 for internal control and quality of information; however, Fornell and Larcker (1981) state that if composite reliability is higher than 0.6, convergent validity is still adequate even when AVE is less than 0.5. Thus, convergent validity was demonstrated.

As seen from **Table 4**, all the Composite reliability values are higher than 0.60. However, not all the AVE values are higher than 0.5, where both the Internal Control and Quality of information are lower than 0.5, but according to Fornell and Larcker (1981), if AVE is less than 0.5, composite reliability is higher than 0.6, the convergent validity of the construct is still adequate, which means that the constructs are valid.

Table 4. Convergent validity.

	Composite reliability	**Average Variance Extracted (AVE)**
Artificial Intelligence	0.973	0.710
Internal Control	0.928	0.394
Quality of Information	0.905	0.426

Structural model testing used a bootstrapping procedure with 5000 resamples (Preacher and Hayes, 2008). As shown in **Figure 1** and **Table 4**, the path from artificial intelligence to internal control was insignificant (β = 0.151, p = 0.405), failing to support Hypothesis 1. The path from internal control to quality of information was significant (β = 0.645, $p < 0.001$), supporting Hypothesis 2. The direct effect of artificial intelligence on information quality was insignificant (β = 0.070, p = 0.429),

rejecting Hypothesis 3. Finally, the indirect effect of artificial intelligence on the quality of information through internal control was insignificant ($\beta = 0.098$, $p = 0.415$), rejecting Hypothesis 4.

4.3. Assessment of the structural model

4.3.1. Hypotheses testing

As shown in **Figure 3**, the structural model aims to examine the impact of AI on the quality of information in Jordanian banks: the mediating role of internal control, the bootstrapping technique (Preacher and Hayes, 2008) used to test the research Hypotheses:

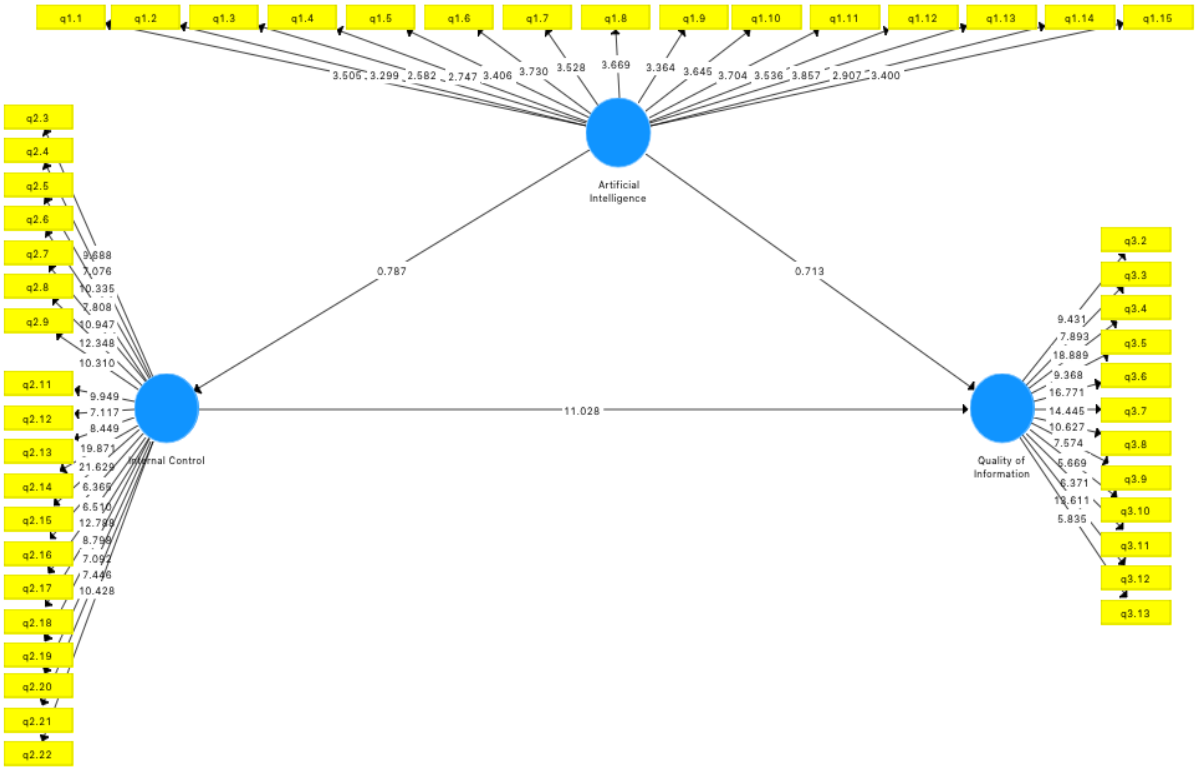

Figure 3. Structural model results.

In order to test the research Hypotheses, the bootstrapping technique was used in the Smart PLS 3.3 Software, the result of Path A (Artificial Intelligence → Internal Control), Path B (Internal Control → Quality of Information), Path C (Artificial Intelligence → Quality of Information) and Path C' (Artificial Intelligence → Internal Control → Quality of Information) Hypotheses testing is shown in **Table 5** as follow:

Table 5. Path A, B, C and C' hypotheses testing.

Path	hypothesis	relationship	β	p	result
A	H1	AI → IC	0.151	0.405	Not supported
B	H2	IC → QI	0.645	< 0.001	Supported
C	H3	AI → QI	0.070	0.429	Rejected
D	H4	AI → IC → QI	0.098	0.415	Rejected

***, ** and * indicates significant at 1%, 5% and 10% level, respectively.

4.3.2. Predictive relevance Q^2, explanatory power R^2 and the effect size f^2

In order to examine the Predictive Relevance Q^2, Explanatory Power R^2 and the Effect Size f^2 the PLS Algorithm and Blindfolding techniques are used as seen in **Figure 4**. As shown in **Table 5**, effect sizes were small for the influence of artificial intelligence on internal control and quality of information but large for internal control on quality of information (Cohen, 1988). Predictive relevance was also demonstrated with Q^2 values above zero (Stone-Geisser's Q^2), Cohen (1988).

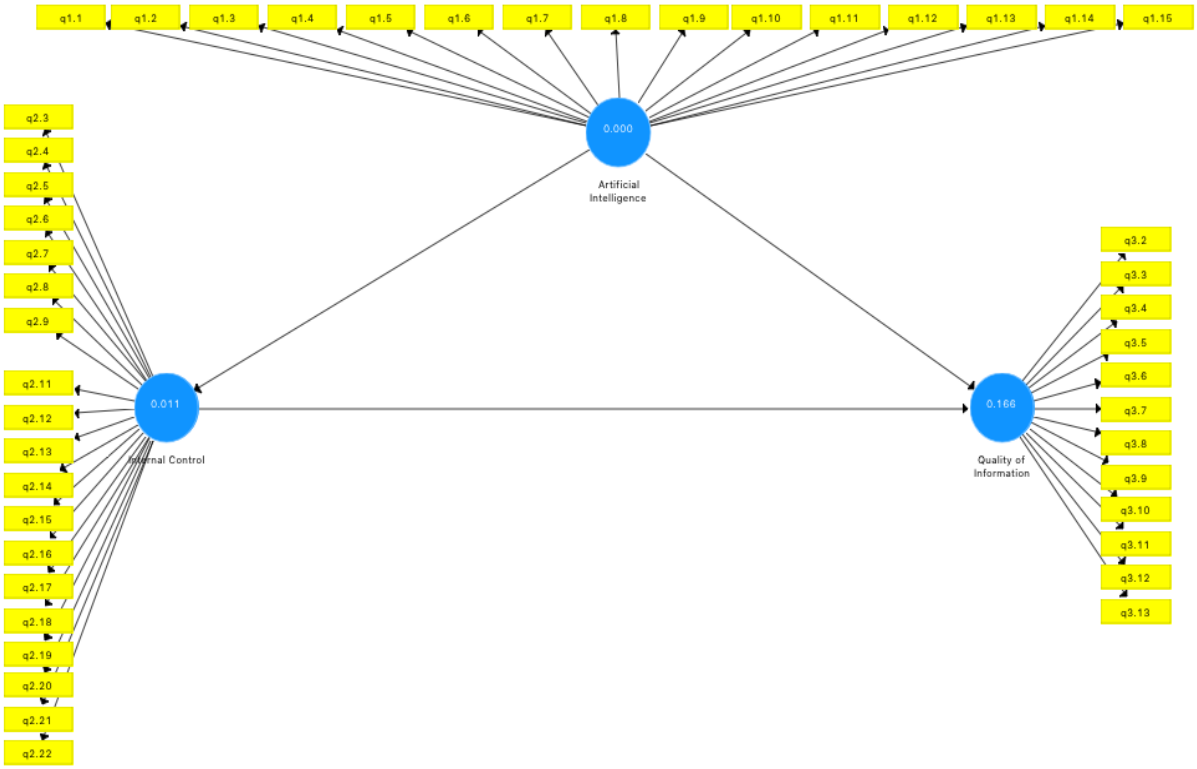

Figure 4. Blindfolding techniques.

Table 6 shows that the mediating role of Internal Control on the impact of Artificial Intelligence on the Quality of information in Jordanian banks has an explanatory power of 40.6%; on the other hand, the impact of Artificial Intelligence on the Quality of information in Jordanian banks has an explanatory power of 1.7%. These results mean that the mediating role of Internal Control on the impact of Artificial Intelligence on the Quality of information in Jordanian banks explains 40.6% of the variation in the Quality of information in Jordanian banks. According to Cohen's (1988) guidelines, $f^2 \geq 0.02$, $f^2 \geq 0.15$, and $f^2 \geq 0.35$ represent small, medium, and large effect sizes, respectively. Accordingly, there is a small effect size of Artificial Intelligence on the Internal Control and a small effect size of AI on the Quality of Information. However, Internal controls have a significant effect size on the Quality of Information. Furthermore, Stone–Geisser Q-square is predictive relevance, which measures whether a model has predictive relevance (> 0 is good). Further, Q^2 establishes the predictive relevance of the endogenous constructs. Q-square values above zero indicate that your values are well reconstructed and that the model has predictive relevance; in this research, the Q^2 values are higher than zero,

which means the research model has a predictive relevance.

Table 6. Q^2, R^2 and f^2.

Model	Internal control			Quality of information		
	f^2	R^2	Q^2	f^2	R^2	Q^2
Artificial Intelligence	0.017	0.017	0.011	0.016	0.406	0.166
Internal Control	-	-	-	0.684		

5. Discussion

The constrained understanding of AI's capabilities within the Jordanian banking sector aligns profoundly with Obwegeser et al.'s (2022) argumentative framework, reinforcing that managerial interpretations wield significant influence over technological adoption trajectories. The existence of narrow mental models among key decision-makers inevitably confuses AI applications to specific, delimited tasks. However, to unleash AI's true transformative potential, organizations must comprehensively appreciate its capacity to revolutionize discrete operational aspects and the overarching fabric of internal control mechanisms and information outcomes. This aligns harmoniously with Karajić et al.'s (2022) call for enterprise-wide assimilation of AI, recognizing its potential as a catalyst for fundamental organizational metamorphosis.

Beneath the surface of limited AI comprehension lies a fundamental challenge: organizations must transcend the acquisition of rudimentary AI knowledge to foster a corporate culture deeply rooted in dynamic learning and relentless experimentation with emerging technologies, as expounded by Srivastava et al. (2020). This cultural metamorphosis is a critical linchpin in the journey towards effective AI adoption. It empowers employees to remain agile despite rapid technological evolution and engenders a climate conducive to cultivating innovation. Kenton's (2022) insights into the role of change management are paramount in this context. They underscore the vital importance of facilitating collective sensemaking, an indispensable prerequisite for organizations seeking to navigate the intricate landscape of non-linear innovations exemplified by AI.

The lacunae identified within consulting audit committees of Jordanian banks reverberate strongly with Asiedu and Deffor's (2017) clarion call for integrated structural frameworks. Pioneering control systems designed to harness AI's transformative potential entirely necessitates a pivot from the automation of mundane, routine tasks to the establishment of all-encompassing monitoring mechanisms seamlessly interwoven across departmental boundaries, as per Sun and Vasarhelyi's (2021) perspective. This transformation engenders the imperative of nurturing robust coordination and unfettered communication channels that permeate the organizational landscape, a concept vividly illustrated by Bartikowski and Kamesh (2022). Notably, the symbiotic understanding between controllers and auditors concerning AI-based controls, as elucidated by Braun et al. (2022), represents the fulcrum upon which collective potency hinges. It is only through this shared comprehension that organizations can effectively harness the transformative potential of AI within their audit and control functions.

The perpetuity of transparent reporting practices amidst the ever-evolving technological panorama reverberates with the arguments posited by Abernathy et al. (2021), reinforcing the notion that baseline oversight disciplines are the bedrock upon which rigorous financial reporting is constructed. This assertion holds particularly true within developing economies like Jordan, where establishing these foundational controls becomes the scaffolding upon which the assimilation of cutting-edge innovations such as AI precariously rests, as Guthrie et al. (2021) aptly emphasized. The progression beyond rote automation necessitates establishing robust initial systems, serving as the springboard for a more profound integration of AI technologies.

The discernible absence of substantial AI impacts in Jordanian banks underscores Arnold et al.'s (2020) contention that surface-level AI applications, often categorized as 'narrow AI,' exhibit limited transformational capacity compared to the nascent 'general AI,' which holds the promise of fundamentally reshaping accounting paradigms (Kenton, 2022; Warren et al., 2022). Within the current context, Jordanian banks appear predominantly tethered to narrow AI. To traverse the transformative chasm towards general AI, enterprises must actively cultivate dynamic capabilities capable of facilitating rapid adaptation to non-linear, emergent technologies, as Obwegeser et al. (2022) underscored.

In synthesis, while significant, the automation of isolated tasks merely scratches the surface of AI's potential. The realization of AI's promise hinges upon a triumvirate of interdependent factors: astute managerial sensemaking, meticulously orchestrated structural coordination and an unwavering commitment to baseline control disciplines. Both technological evolution and the organic maturation of organizational processes are inextricably bound, constituting the crucible within which AI's transformative capabilities are fully harnessed. This profound understanding illuminates the current state of AI adoption within Jordanian banks and charts a compelling trajectory for future research and industry practice, beckoning the academic community to delve deeper into the intricate nuances of AI's integration into the financial sector.

6. Conclusion

This research contributes valuable empirical insights into the current state of AI adoption and its ramifications within the landscape of Jordanian banks. Research findings illuminate a nuanced picture wherein AI integration, while present, remains largely confined to specific applications tailored for targeted tasks. This limited deployment of AI is insufficient to usher in a profound transformation of internal control processes and informational outcomes. Such findings resonate with broader discussions in emergent technologies, aligning with the "S-curve" adoption pattern posited by Arnold et al. (2018). This pattern suggests that initial adoption phases focus on enhancing discrete activities before eventually evolving to facilitate holistic organizational transformation. However, it is essential to recognize that despite the cautious pace of AI assimilation, Jordanian banks exhibit an unwavering commitment to maintaining foundational control systems. This commitment persists even amidst the backdrop of technological uncertainty. This paradoxical situation underscores the strategic importance of preserving core control mechanisms while navigating the uncharted waters of AI integration.

7. Scientific contribution

The scientific contribution of this study lies in theoretical methodologies, this study addresses the intersection of AI, internal control, and accounting information quality within Jordanian banks, filling a gap in existing literature. Employing a rigorous methodology utilizing both electronic and paper questionnaires with quantifiable variables enhances the study's reliability and validity, contributing to methodological advancements in this field. Utilizing the descriptive analytical method, the research delves into the direct and mediating impacts of AI and internal control on accounting information quality, offering a comprehensive understanding of their interactions. Empirically, the findings challenge assumptions by revealing that AI doesn't directly impact internal control, prompting further exploration into AI's organizational influences. Moreover, the study reaffirms the significance of internal control on accounting information quality, aligning with established frameworks like COSO. Despite finding no direct impact, the examination of AI's influence on information quality contributes to ongoing debates on AI's transformative potential in financial reporting. Additionally, the study's nuanced exploration of internal control's mediating role adds depth to our comprehension of these dynamics, indicating that while vital for financial reporting quality, internal control mechanisms may not necessarily mediate AI's impact on information quality as previously believed. This integrated approach between theoretical frameworks and empirical findings advances our understanding of AI, internal control, and accounting information quality within Jordanian banks, offering valuable insights for academia and industry alike.

Author contributions: Conceptualization, BAO and MAN; methodology, MAN; software, BAO; validation, BAO and MAN; formal analysis, BAO; investigation, MAN; resources, MAN; data curation, BAO; writing—original draft preparation, BAO; writing—review and editing, MAN; visualization, BAO; supervision, MAN; project administration, MAN; funding acquisition, MAN. All authors have read and agreed to the published version of the manuscript.

Conflict of interest: The authors declare no conflict of interest.

References

Abbasi, A., Sarker, S., & Chiang, R. H. (2016). Ample data research in information systems: Toward an inclusive research agenda. Journal of the Association for Information Systems, 17(2), 3.

Abdel Nour, A. (2014). Expert Systems, Publications of the Department of Electrical Engineering. University of King Saud.

Achim, A. M., & Chiş, A. O. (2014). Financial accounting quality and its defining characteristics. SEA: Practical Application of Science, 2(3).

Ahmad, J., Farman, H., & Jan, Z. (2019). Deep learning methods and applications. In: Deep learning: Convergence to big data analytics. Springer.

Al Natour, J. R. A. Q. (2021). The impact of information technology on the quality of accounting information (SFAC NO 8, 2010). Turkish Journal of Computer and Mathematics Education (TURCOMAT), 12(13), 885-903.

Al-Ali, S., Alali, H., Alslihat, N., et al. (2017). The Impact of Financial Information Systems on the Quality of Financial Statements: The Case of Jordanian Commercial Banks. International Journal of Applied Business and Economic Research, 15(25), 501.

Alasgarova, A., Muradkhanli, L. (2008). Expert System for Decision Making Problem in Economics. International Journal Information Technologies and Knowledge, 2, 297-299.

Alawaqleh, Q. A. (2021). The impact of accounting information systems on the quality of accounting information according to users' perceptions: Evidence from Jordan. Academy of Accounting and Financial Studies Journal, 25(3), 1-18.

Al-Bishtawi, S, Al-Baqmi, M. (2015). The Impact of the application of expert systems in commercial banks on electronic Auditing procedures from the point of view of external chartered accountants: A Comparative study in the Hashemite Kingdom of Jordan and the Kingdom of Saudi Arabia. The Jordanian Journal of Business Administration, 11(1), 117-151.

Al-Dalabih, A. M. (2018). The association between best disclosure practices and information asymmetry: Evidence from listed banks in Jordan. Academy of Accounting and Financial Studies Journal.

Alex, O. H. (2019). What is the difference between robotics and artificial intelligence? Available online: https://blog.robotiq.com/whats-the-difference-between-robotics-and-artificial-intelligence (accessed on 2 May 2024).

Ali, A. Z. (2017). The role of expert systems in the quality of decision-making of senior management in the Palestinian Ministry of Health [Master's thesis]. Al-Aqsa University.

Ali, S. A., Ghaffari, M., Liao, X., & Hall, E. (2006). Mobile robotics, moving intelligence. In: Mobile Robotics. Moving Intelligence.

Al-Jaber, E. M. (2020). The impact of accounting information systems in improving the quality of accounting information in commercial banks in Jordan: Field study. Academy of Accounting and Financial Studies Journal.

Al-Jaber, G. M. O. (2020). The impact of artificial intelligence on the efficiency of accounting systems in Jordanian banks [Master's thesis]. Middle East University.

Al-Samarrai, K. (2016). Evaluating the quality of disclosure and transparency in the annual reports of public shareholding companies listed in the Amman Stock Exchange. Jordan Journal of Business Administration, 12(2), 437-464.

Al-Samarrai, M. H. M. (2016). The impact of the internal control system on the quality of financial reports: An analytical study on the Jordanian pharmaceutical companies listed on the Amman Stock Exchange [Master's thesis]. University of the Middle East.

Alslihat, N., Matarneh, A. J., Moneim, U. A., et al. (2018). The impact of internal control system components of the COSO model in reducing the risk of cloud computing: The case of public shareholding companies. Ciência E Técnica Vitivinícola, 33(4), 188-202.

Arnold, V., Benford, T., Hampton, C., & Sutton, S. G. (2020). Enterprise Risk Management: Retrospective and Prospective. Journal of Information Systems, 34(2), 73-91.

Asiedu, K. F., & Deffor, E. W. (2017). Fighting Corruption by Means of Effective Internal Audit Function: Evidence from the Ghanaian Public Sector. International Journal of Auditing, 21(1), 82-99. https://doi.org/10.1111/ijau.12082

Askary, S., Pounder, J. S., & Yazdifar, H. (2018). Understanding and Managing Accounting Information Quality in the Age of Big Data. Journal of Management Control, 29(1), 5-24.

Awan, U., Kanwal, N., Alawi, S., et al. (2021). Artificial intelligence for supply chain success in the era of data analytics. In: The Fourth Industrial Revolution: Implementation of Artificial Intelligence for Growing Business Success. Springer.

Aziz, S., & Dowling, M. (2019). Machine Learning and AI For Risk Management. In: Disrupting Finance. Palgrave Pivot.

Balakrishnan, K. P., Prakash, L., & Ramesh, L. (2020). Impact of ai technology in accounting and finance. The International Journal of Analytical and Experimental Modal Analysis, 12(5), 714-726.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. Journal of personality and social psychology, 51(6), 1173.

Barth, M. E., Li, K., & McClure, C. (2021). Evolution in value relevance of accounting information. The Accounting Review, 98(1), 1-28.

Bartikowski, B., & Kamesh, V. (2022). Bridging the AI audit expectation gap through coordinated sensemaking between auditors and controllers. International Journal of Accounting Information Systems, 43, 100505.

Bataller, C., & Harris, J. (2018). Turning Artificial Intelligence into Business Value. Today: Accenture Emerging Technology Group.

Bengio, Y., Lecun, Y., & Hinton, G. (2021). Deep learning for AI. Communications of the ACM, 64(7), 58-65.

Bostan, I., Epure, D. T., Panait, A. & Iancu, E. (2009). Possibilities of using Expert systems in accounting function of companies. Metaluraia International, 14(9), 109-112.

Braun, R. L., Davis, H. E., & Hollingsworth, C. W. (2022). Challenges of auditing AI and cognitive technologies. Journal of Information Systems, 36(1), 107-122.

Cavusoglu, M. (2019). An analysis of technology applications in the restaurant industry. Journal of Hospitality and Tourism

Technology.
CIGREF. (2018). Artificial intelligence and human capital: challenges for companies? (French). CIGREF.
Cockcroft, S., & Russell, M. (2018). Big data opportunities for accounting and finance practice and research: Big data in accounting and finance. Australian Accounting Review, 28(3), 323-333.
Cohen, J. (1988). Statistical power analysis for the behavioral Sciences, 2nd ed. Routledge.
Dai, J., & Vasarhelyi, M. A. (2022). Imagineering Audit 4.0. Journal of Emerging Technologies in Accounting, 19(1), 1-21.
Deshmukh, A., & Talluru, L. S. (2022). Governing artificial intelligence: The role of internal audit. Journal of Emerging Technologies in Accounting, 19(1), 107-118.
Dufour, D., Luu, P., & Teller, P. (2020). Accruals quality and leverage adjustments. Journal of Applied Accounting Research.
Elbannan, M. A. (2009). Quality of internal control over financial reporting, corporate governance and credit ratings. International Journal of Disclosure and Governance, 6(2), 127-149.
Ferguson, R., & Green, A. D. (2018). Applying deep learning to derivatives valuation. SSRN Electronic Journal.
Fitriati, A., Tubastuvi, N., & Anggoro, S. (2020). The role of AIS success on accounting information quality. The International Journal of Business Management and Technology, 4(2), 43-51.
Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics. Journal of Marketing Research, 18(3), 382-388.
Gerasimou, S., Eniser, H. F., Sen, A., & Cakan, A. (2020). Importance-driven deep learning system testing. In: Proceedings of the 2020 IEEE/ACM 42nd International Conference on Software Engineering (ICSE).
Grewal, D. S. (2014). A critical conceptual analysis of definitions of artificial intelligence as applicable to computer engineering. IOSR Journal of Computer Engineering, 16(2), 9-13.
Guthrie, J., Dumay, J., & Pisani, M. J. (2021). When 'Boring Accounting' Becomes Interesting: How an AI machine makes professionals reflect. Accounting, Auditing & Accountability Journal.
Hair, J. F., Black, W. C., Babin, B. J., et al. (2010). SEM: An introduction. In: Multivariate data analysis: A global perspective. Pearson.
Hamadneh, J. M., Alkot, T., & Alshboul, M. K. (2021). The adoption of AI accounting in Jordan–opportunities and challenges. Academy of Accounting and Financial Studies Journal.
Islam, M. J., Nguyen, G., Pan, R., & Rajan, H. (2019). A comprehensive study on deep learning bug characteristics. In: Proceedings of the 2019 27th ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering.
Jayantha, M. R. D. U. A. (2018). Effectiveness of entity-level controls: The case of controlling fraud risks in the Sri Lankan banking sector. Banks and Bank Systems, 13(4).
Kahraman, C., Kaya, I., & Çevikcan, E. (2011). Intelligence decision systems in enterprise information management. Journal of Enterprise Information Management, 24(4), 360-379.
Kanagaretnam, K., Krishnan, G. V., & Lobo, G. J. (2022). Effects of national institutional factors on enterprise risk management around the globe. Journal of International Accounting Research, 21(1), 21-49.
Karajić, D., Ibrahimbegović, A., & Kurtović, E. (2022). Enterprise Risk Management for Artificial Intelligence Systems. Risks, 10(1), 11.
Kenton, W. (2022). Change Management. Available online: https://www.investopedia.com/terms/c/change-management.asp (accessed on 2 May 2024).
Kieso, D. E., Weygandt, J. J., & Warfield, T. D. (2019). Intermediate accounting, 17th ed. Wiley.
Kokina, J., & Blanchette, S. (2019). Early evidence of digital labour in accounting: Innovation with Robotic Process Automation. International Journal of Accounting Information Systems, 35, 100431.
Kokina, J., Blanchette, S., & Azadegan, A. (2022). Use of digital labour in accounting practice and the COSO (2013) framework principles: Implications of an emerging technology. Journal of Accounting Literature, 50, 100810.
LeCun, Y., Bengio, Y., Hinton, G. (2015). Deep learning. Nature, 521, 436-444.
Lee, J., Davari, H., Singh, J., & Pandhare, V. J. M. l. (2018). Industrial Artificial Intelligence for industry 4.0-based manufacturing systems. Manufacturing Letters, 18, 20-23.
Leung, T., Connor, J., Jiang, Y., et al. (2022). The awakening giant of enterprise risk management in accounting. Accounting & Finance.
Li, C., Peters, G. F., Richardson, V. J., & Watson, M. W. (2012). The consequences of information technology control weaknesses

on management information systems: The case of Sarbanes-Oxley internal control reports. MIS Quarterly.

Li, X., Lu, R., Kou, G., & Xu, X. (2019). Integrated environmental risk assessment of midstream natural gas operation using a hybrid Monte Carlo and interval-valued Pythagorean fuzzy AHP methodology. Science of the Total Environment, 664, 1-12.

Ma, L., & Sun, B. (2020). Machine learning and AI in marketing–Connecting computing power to human insights. International Journal of Research in Marketing, 37(3), 481-504.

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. Psychological Methods, 1(2), 130.

McCarthy, J. (1989). Artificial intelligence, logic and formalizing common sense. In: Philosophical logic and artificial intelligence. Springer.

Moffitt, K., Rozario, A. M., & Vasarhelyi, M. A. (2018). Robotic process automation for auditing. Journal of Emerging Technologies in Accounting, 15(1), 1-10.

Moudud-Ul-Huq, S. (2014). The role of artificial intelligence in the development of accounting systems: A review. IUP Journal of Accounting Research & Audit Practices, 13(2), 7-19.

Murphy, T., & O'Connell, V. (2013). Discourses surrounding the evolution of the IASB/FASB Conceptual Framework: What they reveal about the "living law" of accounting. Accounting, Organizations and Society, 38(1), 72-91.

Nalukenge, I., Nkundabanyanga, S. K., & Tauringana, V. (2012). Literacy, external user-pressure, and quality of accounting information of Ugandan SMEs. In: Accounting in Africa. Emerald Group Publishing Limited.

Naumov, N. (2019). The impact of robots, artificial intelligence, and service automation on service quality and service experience in hospitality. In: Robots, Artificial Intelligence, and Service Automation in Travel, Tourism and Hospitality. Emerald Publishing Limited.

Ngo, D. Q., Nguyen, D. X., Van Huynh, T. L., et al. (2021). The role of information system and internal control system on financial report quality: Insights from Vietnamese enterprises. Cogent Business & Management, 8(1), 1951146.

Njegus, A. (2013). Foundations of Information Systems. Singidunum University.

Noor, N. R. A. M., & Mansor, N. (2019). Exploring the adaptation of artificial Intelligence in whistleblowing practice of the internal auditors in Malaysia. Procedia Computer Science, 163, 434-439.

Obwegeser, N., Goyal, S., Papadopoulos, T., & Bechina, A. A. (2022). Meaning making through sharing early artificial intelligence (AI) experiences for two sociotechnical imaginaries. International Journal of Information Management, 63, 102495.

Odoh, L. C., Echefu, S. C., Ugwuanyi, U. B., & Chukwuani, N. V. (2018). Effect Of artificial intelligence on the performance of accounting operations among accounting firms in South East Nigeria. Asian Journal of Economics, Business and Accounting, 7(2), 1-11.

Othman, H., Ahmed, A. J. (2012). The Possibility of Using Artificial Intelligence Techniques in Controlling the Quality of Internal Auditing (A Field Study in Jordanian Public Shareholding Companies). In: Proceedings of the Eleventh Annual Scientific Conference on Business Intelligence and Knowledge Economy.

Payne, E. A., Ramsay, R. J., & Bamber, E. M. (2022). Audit standards, legal liability regimes, and audit quality. Contemporary Accounting Research, 39(1), 253-297.

Phomlaphatrachakom, K. (2020). Accounting control system, accounting information quality, value creation, and firm success: An empirical Investigation of auto parts businesses in Thailand. International Journal of Business, 25(2), 159-177.

Phomlaphatrachakom, T. (2020). The Internal Audit Quality and Financial Reporting Quality: Evidence from Thailand. Journal of Accounting, Business and Finance Research, 10(2), 88-96.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. Behavior research methods, 40(3), 879-891.

Provasi, R., & Riva, P. (2015). The updated COSO report 2013. Journal of Modern Accounting and Auditing, 11(10), 487-498.

PWC. (2019). Artificial Intelligence: What place for morality? (French). PWC Transformation.

Romney, M. B., & Steinbart, P. J. (2019). Accounting Information Systems. Pearson.

Romov, P., & Sokolov, E. (2015). Recsys challenge 2015: Ensemble learning with categorical features. In: Proceedings of the 2015 International ACM Recommender Systems Challenge.

Romov, P., & Sokolov, E. (2015). Recsys challenge 2015: Ensemble learning with categorical features. In: Proceedings of the 2015 International ACM Recommender Systems Challenge.

Rose, A. M., Rose, J. M., Sanderson, K. A., & Thibodeau, J. C. (2017). When should audit firms introduce analyses of Big Data

into the audit process? Journal of Information Systems, 31(3), 81-99.
Rose, J. M., Mazza, C. R., Norman, C. S., & Rose, A. M. (2020). Designing internal controls to mitigate data analytics risk. Accounting Horizons, 34(2), 147-163.
Rozario, A. M., & Vasarhelyi, M. A. (2021). How robotic process automation is transforming accounting. The CPA Journal, 91(6), 46-51.
Sekari, G. G. & Srinat, M. & Veluchamy, G. (2015). Expert System—an innovative tool for managing Indian traditional medical knowledge. In: Proceedings of the 9th world congress on healthy information and libraries.
Srivastava, S. C., Chandra, S., & Shirish, A. (2020). Technostress creators and job outcomes: Theorising the moderating influence of personality traits. Information Systems Journal, 30(4), 755-788.
Stevens, J. P. (1992). Applied multivariate statistics for the social sciences. Lawrence Erlbaum.
Straub, D., Boudreau, M. C., & Gefen, D. (2004). Validation guidelines for IS positivist research. Communications of the Association for Information Systems, 13(1), 24.
Sun, T. (2018). Deep learning applications in audit decision making [PhD thesis]. Rutgers University-Graduate School-Newark.
Sun, T., & Vasarhelyi, M. A. (2021). Embracing Textual Data Analytics in Auditing with Deep Learning. Journal of Emerging Technologies in Accounting, 18(2), 27-40.
Sutton, R. S., & Barto, A. G. (2018). Reinforcement learning: An introduction. MIT press.
Sutton, S. G., Arnold, V., Bedard, J., et al. (2012). Data analytics and continuous auditing: Research opportunities. Journal of Emerging Technologies in Accounting, 9, 101-112.
Thapayom, A., & Ussahawanitchakit, P. (2015). Accounting information system excellence and goal achievement: Evidence from information and communication technology businesses in Thailand. The Business & Management Review, 7(1).
Thapayom, W., & Ussahawanitchakit, P. (2015). Roles of accounting information on performance in the Thai banking industry: Mediating effects of information technology capability. Review of Integrative Business and Economics Research, 4(3), 314-335.
Turgaeva, A. A., Kashirskaya, L. V., Zurnadzhyants, Y. A., et al. (2020). Assessment of the financial security of insurance companies in the organization of internal control. Entrepreneurship And Sustainability Issues, 7(3), 2243.
Vasarhelyi, M. A., Kogan, A., & Tuttle, B. M. (2015). Big data in accounting: An overview. Accounting Horizons, 29(2), 381-396.
Wang, P. (2019). On Defining Artificial Intelligence. Journal of Artificial General Intelligence, 10(2), 1-37.
Warren, J. D., Moffitt, K. C., & Byrnes, P. (2022). Reimagining auditing in a technological world through the eyes of emerging assurance professionals. Journal of Information Systems, 36(1), 1-21.
Wiljer, D., & Hakim, Z. (2019). Developing an Artificial Intelligence–Enabled Health Care Practice: Rewiring Health Care Professions for Better Care. Journal of Medical Imaging and Radiation Sciences, 50(4, Supplement 2), S8-S14.
Yoon, K., Hoogduin, L., & Zhang, L. (2022). Do Auditors Assess Automated Controls Differently? Audit Data Analytics and the Assessment of Reliability Risk. Journal of Information Systems, 36(2), 185-205.
Zakaria, H. (2021). The Use of Artificial Intelligence in E-Accounting Audit. In: The fourth industrial revolution: Implementation of artificial intelligence for growing business success. Springer.
Zhang, S., & Hou, Z. (2019). Analysis on the Correlation between Internal Control Quality and Accounting Information Quality of Listed Companies in China. In: Proceedings of the 2019 9th International Conference on Management, Education and Information (MEICI 2019).
Zhang, Z., & Hou, Y. (2019). The impact of enterprise risk management on firm performance: Evidence from China. Asian Review of Accounting.
Zhu, H., & Shen, L. (2021). Research on the impact of artificial intelligence on audit. Revista de Contabilidad, 24(1), 147-156.
Zhu, X. J. (2005). Semi-supervised learning literature survey. University of Wisconsin—Madison.

Appendix

Survey questionnaire

Greetings

The researcher conducts a study entitled: **"The Impact of Artificial Intelligence on the Quality of Information in Jordanian Banks: The Mediating Role of Internal Control"**, In order to complete the requirements for obtaining a master's degree in accounting and finance.

Therefore, the researcher developed a questionnaire to measure the impact of variables for each dimension of AI, internal control, and quality of information (i.e., machine learning, deep learning, expert systems, control environment, control activities, risk assessment, risk response, objective identification and event identification, information and communication, monitoring, faithful representation, and relevance and comparability, understandability).

With the aim of collecting data for the study's topic and making recommendations that contribute to improving the quality of information. Directs the identification of the population study consisting of Jordanian banks listed on the Amman Stock Exchange.

Thankful and appreciative for your cooperation and scientific effort to enable me to achieve the study's objectives.

Yours sincerely

Supervising: Dr. Munther Barakat Al-Nimr

Researcher: Bilal Mohammad Al-Omari

The Hashemite University

Faculty of Graduate Studies/Department of Accounting

Part one: Demographic characteristics:

1) Age:

□ Less than 35 years old □ 35–50 years old □ Over 50 years old

2) Academic qualification:

□ High School □ Diploma □ Bachelor's degree
□ Master's □ PhD

3) Specialization:

□ Accounting □ Business Administration □ Finance and Banking Sciences
□ Computer Science □ Other (please mention)

4) Years of experience in the current field of work:

□ Less than 5 years □ From 5 to less than 10 years
□ From 10 to less than 15 years □ More than 15 years

5) Administrative level:

General Manager Financial Manager Accountant
Internal auditor Programmer Other (please mention)

6) Professional certifications:

ACCA CFA CIA CMA JCPA CPA
Other (please mention)

Part two: General information about the bank:

7) How many employees in the bank?

Less than 50 employees 50 to 150 employees From 151 to 300 employees
500–301 employees More than 500 employees

8) How old is the bank?

Less than 10 years old — Between 10 and 20 years old
Between 20 and 50 years old — Over 50 years old

9) How many branches does the bank have?

Less than 10 branches — between 10 and 20 branches
between 20 and 30 branches — More than 30 branches

Part three: Questions related to research variables

The following statements are related to artificial intelligence in Jordanian banks, please put an (X) mark in front of the answer you deem appropriate.

No	Artificial intelligence	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
(1) Machine learning:						
1.	The Bank has the appropriate environment for the operation of artificial intelligence technologies.					
2.	Artificial intelligence techniques provide automatic problem solving.					
3.	Artificial intelligence enhances the reduction of daily routine problems in the operations of banks.					
4.	Artificial intelligence techniques contribute to the processing of accounting events and processes.					
5.	Artificial intelligence techniques are distinguished in handling logical and programmed errors.					
6.	AI-powered banking technologies have the automatic ability to notice any manipulation.					
(2) Deep learning:						
1.	The use of artificial intelligence techniques contributes to preventing operational errors to reach a high level of efficiency.					
2.	Artificial intelligence provides speed of interaction and response between the accounting system and other systems in the bank.					
3.	Artificial intelligence contributes to the verification of financial reports received from clients.					
4.	Artificial intelligence provides financial data analysis mechanisms that increase the ability of management to prepare annual and interim financial statements.					
5.	Artificial intelligence enables banks to offer the service of opening an account through its smart applications.					
(3) Expert systems:						
1.	The expert systems are distinguished in developing solutions to the various problems of the bank.					
2.	Expert systems contribute to improving the decision-making process in the bank through the information stored in the databases.					
3.	Expert systems assist managers in the planning and decision-making process in the bank.					
4.	Expert systems provide the ability to research massive data sources and provide conclusions and recommendations based on knowledge.					

The following statements are related to the internal control in Jordanian banks, please put an (X) mark in front of the answer you deem appropriate.

No	Internal control	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
(1) Control Environment:						
1.	The senior management of the bank is concerned with the reports issued by the internal control committees.					
2.	The Bank's audit committees are consulted when any modification is made to the organizational structure.					
3.	The Bank's management uses written administrative and financial reports as a control tool.					
(2) Control Activities:						
1.	The process of distributing powers at the different administrative levels contributes to improving control procedures.					
2.	Control activities are carried out and followed as specified in the Bank's policies and procedures.					
(3) Risk Assessment:						
1.	The risk section identifies all the risks that can be controlled.					
2.	The internal control system enables the monitoring and detection of errors in the bank by the internal auditors.					
3.	The executive management is responsible for setting up an effective structure for risk management operations.					
(4) Risk Response:						
1.	The internal control system in the bank provides for minimizing the possibility and impact of risks.					
2.	Accept the possibility and impact of risk in the bank.					
3.	Accountants and systems designers assist management in designing effective control systems to reduce inherent risks.					
(5) Objective Identification:						
1.	Management identifies alternative ways of achieving strategic objectives; Identify and assess the risks and implications of each alternative.					
2.	The Bank's management provides a set of operational objectives, which address the effectiveness and efficiency of the Bank's operations, and how resources are allocated.					
3.	Reporting objectives help to ensure the accuracy, completeness, and reliability of Bank reports; improving the decision-making process; Monitoring the Bank's activities and performance.					
4.	It is the extent to which the Bank succeeds in meeting compliance and reporting objectives that can significantly affect the Bank's reputation.					
(6) Event Identification:						
1.	The Bank provides some techniques for identifying events through the use of a comprehensive list of potential events, internal analysis, and business process analysis.					
(7) Information and Communication:						
1.	The bank has an accounting information system that contributes to improving internal control procedures.					
2.	The awareness of users of an information system in the bank contributes to improving the internal control procedures.					

3.	The internal control system can effectively apply audits in the information systems environment.					
(8)	**Monitoring:**					
1.	The independence and objectivity of the internal auditor contributes to improving the quality of internal control.					
2.	Enhance the results of oversight reports in addressing problems and improving performance.					
3.	Evaluation findings contribute to improving policies and operations.					

The following statements are related to the quality of accounting information in Jordanian banks, please put an (X) mark in front of the answer you deem appropriate.

No	Quality of Information	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
(1) Faithful representation:						
1.	The annual report contains an unqualified auditor's report.					
2.	The bank's accounting information is characterized by achieving objectivity in its presentation.					
3.	The Bank does not provide selection information to favor one group of interested parties over another.					
4.	The information contained in the financial reports is free from bias.					
5.	The Bank provides disclosures and clarifications on the items of financial reports.					
6.	The Bank contributes to providing clarity, transparency, and completeness in financial reporting.					
(2) Relevance:						
1.	Bank reports comply with their business requirements as they contain both financial and non-financial information.					
2.	Bank financial reports contain predictive value measurement indicators.					
3.	Financial reports provide information about the performance of different financial levels in a timely manner					
4.	The Bank provides objective information in financial reports.					
(3) Comparability:						
1.	The Bank provides information to other banks in a comparable manner.					
2.	The bank provides the necessary justifications in the event of changing the accounting methods.					
(4) Understandability:						
1.	The Bank contributes to the correct understanding of users in presenting information clearly and accurately in the financial statements.					

- ❖ Would you like to receive a copy of the research results?
  - Yes
  - No

- If yes, please write your E-mail below:

Questionnaire finished