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The role of artificial intelligence in developing the accounting system in Jordanian Islamic banks

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A B S T R A C T

The current study aims to determine the role of artificial intelligence (AI) in developing the accounting system (AS) in Jordanian Islamic banks. Currently, Islamic banks in Jordan are included in the research population. Using a quantitative research approach, 128 workers of Islamic banks in Jordan were chosen as a sample for this study. The study used a survey questionnaire instrument that was created based on past relevant literature and studies to collect the required data. The results indicated that there is an influence of AI (big data, intelligent agents, expert systems and automation processes) on the development of the AS in Jordanian Islamic banks. Accordingly, the study recommends that to improve AS tasks and reduce associated costs, accountants and accounting companies should always increase their understanding of artificial intelligence.

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1. Introduction

AI has advanced significantly in recent years, particularly in the accounting profession, which now concentrates more on computer and software access than paper and pencil entry (El-Bermawy, 2022). AI is being used in almost every element of accounting operations, which has experts worried about whether human accountants will still be relevant to an organization's operations shortly. Where the way financial institutions work is being drastically altered by AI, which is predicted to gradually replace key activities due to cost and operational efficiency (Odoh et al., 2018). Most accounting tasks are now completed by information and communication technology tools, such as audit tool kits, checklists, audit programmers, and integrated audit management units that continuously watch real data and processing requirements, expert systems, and internal control templates that are commonly used to identify system strengths and flaws (Haddad, 2021). The accounting profession has seen remarkable development in the modern era because of technological advancements (Jarah et al., 2023). AI has brought in a golden era that coincides with the fast growth of information technology and the demands of an industrial society. The accounting sector will undergo significant adjustments and advancements due to the unavoidable trend of AI technology use. In many other areas, AI is also shown to be very beneficial to humanity. When it comes to accounting and auditing, they are quite useful and improve the end product's correctness and precision. It may support human efforts in these areas, assist in sorting through the deluge of data, and enable them to concentrate on more pertinent tasks like planning and problem-solving. It has streamlined and expedited the completion of such difficult tasks (Gusai, 2019). Technology has not been able to return the knowledge held by specialists in decision-making and decision-making, despite accountants' long-standing reliance on computers and early computing to increase the efficiency and effectiveness of their banks (Qasaimeh et al., 2022). Therefore,

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AI is a complex concept with both positive and negative connotations. While its benefits are widely acknowledged, there are also risks associated with it. One such risk is the manipulation of banking systems, particularly AS, which can lead to unintended consequences. But, especially for corporate applications, the advantages of using AI exceed the hazards (Haddad, 2021). The degree of risk arising from its usage depends on the effectiveness of AS with all of its components and dimensions are what they define and contain because it is mostly dependent on the amount of AI utilized (Luo et al., 2018). To put it another way, a lot of organizations, particularly banks and financial institutions, have lately automated their operations to survive the competitive climate they operate in (Oláh et al., 2020). Even while automation greatly improves productivity, attains quality, and lowers costs, its benefits are still only realized in regular or low-skilled work (Badarin et al., 2024). As a result, banks have been instructed to employ cutting-edge tools like AI to replace the non-routine cognitive duties carried out by qualified accountants. Banks of all shapes and sizes may now utilize AI to gain access to technology that relieves professional business owners and accountants of a considerable deal of the day-to-day labor-intensive financial and service tasks (Palomares et al., 2021). Therefore, this study examines how AI is being applied in the accounting sector, examines how this has affected the sector's growth, and offers pertinent solutions to the issues that the sector is now facing. Expert systems, on the other hand, assist in deriving information from the reality of knowledge databases that have been stored. The ability to store knowledge swiftly and adequately is made possible by the dimension's knowledge representation and inference, which demonstrates the effectiveness of Jordanian banks' AS in terms of speed and storage efficiency. Conversely, information and conclusions are represented by the bank by certain standards since they are not specific and are instead obtained from the regulatory environment. To lock this gap, research on AI contribution to the development of AS in Jordanian Islamic banks.

2. Literature Review

AI has increased dramatically recently, shifting from paper and pencil input to software and computer entry, especially in the accounting profession (Badran, 2023). The creation of robots and a more robust infrastructure of accounting software professionals has been facilitated by the latest innovations in AI products (Khaled AlKoheji & Al-Sartawi, 2022). Conventional accounting professionals would quit accounting programmers to do a few more difficult jobs throughout the age of AI (Almatarneh et al., 2023). These would help the accounting sector to further revolutionize the accounting area while also greatly improving working performance, minimizing mistakes, and increasing company efficiency (Faccia et al., 2019). As a result, the market environment has changed significantly because of this developing technology phenomenon, which has also impacted company activities. In addition, a lot of sectors are using AI to do jobs that were previously done by people (Jarah et al., 2024). The financial assistance sector has adopted AI when it comes to processing huge volumes of data, detecting fraud by spotting anomalous processes, interacting with customers online, and carrying out different crucial tasks. There are several great application cases in face reorganization, voice recognition, and machine learning, for instance. New technologies not only improve client value propositions but also increase organizational performance and efficiency (Batiz-Lazo et al., 2022). Since the invention of computers, AS and procedures have been transformed from the world of paper journals and booklets into computer formats (Al Zobi & Jarah, 2023). AS has completely transformed as a result of the rise of AI and accounting software. Numerous studies have demonstrated that software expert systems, Internet computers, and more recent advancements in AI all significantly impact accounting operations' productivity (Berdiyeva et al., 2021).

Information technology has undergone a revolution because of AI technologies, which have produced intelligent software and hardware that behave and communicate like people. It has to do with a branch of study that tries to give robots the capacity for mental processes including reasoning, scheduling, learning, and perception. In this way, AI influenced the accounting discipline by reshaping company models and corporate procedures (Moudud-Ul-Huq, 2014). We have entered the "golden age" of AI due to the rapid advancement of information technology and the escalating economic needs of society. The accounting industry will undergo substantial changes due to the inevitable trend of applying this technology to accounting. More than in the domains of financial reporting, auditing, and other accounting professions is the primary cause of the reliance on intelligence applications for artificial applications (Vlacic, et al., 2021). Since the opening of modern technologies that ultimately resulted in radical shifts in processes and reorganization, all enterprises have made significant acquisitions in these areas (Hailat et al., 2023). Over the past few decades, there has been a gradual development of technology to create AI systems. The perception of AI and its service has been the topic of discussion in academia and company practice (Lin, 2021). The swift advancement of AI technology has garnered worldwide interest; its immense influence on many facets of life has grown from a straightforward substitute for human labor to a gradual influence on people's everyday routines. Primary accounting practitioners are among the categories that AI will impact, since it is anticipated that most tasks will be performed by machines in the next years, eliminating the need for human labor (Geisel, 2018). According to a study by Mohammad et al. (2020), an automated system founded on AI can take the place of the major concerns that modern practicing accountants have. Accountants must adapt to the constantly moving corporate environment in addition to the usage of information technology if they wish to escape this destiny. Accounting information systems are information bases for storing, managing, and interpreting data, claim Solaimani et al. (2020). Previous studies have demonstrated that the application of computer-based intelligence reduces problems with bookkeeping data sets, advances the development of frameworks for accounting information systems, and offers autonomous guidance. Regardless of the chief's direct support, coordinating clever frameworks with accounting data sets may help with the examination of massive amounts of information (Jarah et al., 2022). The intelligent frameworks can interpret data, aid customers in understanding conversations, and store, and retrieve data. Because of this, AI may handle the labor-intensive task of various data input and reconciliation (Alqudah et al., 2023). It may also reduce liability by eliminating mistakes. After the regular tasks are finished, accounting experts can concentrate on additional suggested tasks.

Fighting deception: AI helps the compliance team deal with cases of misrepresentation more skillfully by processing vast amounts of data from multiple sources efficiently, identifying complex transactions and dealings, and reporting those transactions and dealings in a visual manner (Bhattacharya & Sinha, 2022). Therefore, in addition to learning the fundamentals of computers, accountants should also study computer programming techniques to improve their present data processing skills. Analytical abilities: Accounting experts examine a significant quantity of financial data by using accounting statements. For this reason, it is crucial to swiftly and appropriately assess the risks involved. Skills include the ability to judge a project's quality and the resources needed to do it swiftly. Both short- and long-term project choices depend heavily on a bank's finance staff's capacity to precisely evaluate the economic climate in which they operate, pinpoint the degree of competition, and serve as a resource (Oduwole & Olukunle, 2023). The findings of Odoh et al. (2018) demonstrated that the effectiveness of the accounting function in accounting companies located in South East Nigeria is significantly impacted by the use of expert systems. The use of AI was found to have a favorable impact on accounting function performance. The results of Li et al. (2020) demonstrate how AI frees accounting personnel from low-level repetitive work, how financial accounting's original purpose changed to provide information to the business to support company decisions, and how administration accounting theory, value design theory, and management intelligence mechanism all work together. The development of accounting theory and the financial knowledge of accountants with demanding, multidisciplinary backgrounds and with universities and companies is facilitated by the junction of theory and AI.

Moreover, accounting automation includes not just a company's financial management department but also the entire accounting lifecycle. This indicates that there is minimal reliance on human transactional entries since software manages all aspects of accounting, including the acquisition, alteration, and interpretation of transactional data (Al-Zaqeba et al., 2022). AI is a technical invention that has garnered significant interest due to its ability to support decision-makers in making dependable judgements. AI is useful for a variety of human tasks, including communication (Suton et al., 2016). The economy, science, and technology are developing at a rapid pace, ushering in the age of AI, which has profound effects on every part of life. AI is the way of the future for the accounting profession, as it may provide more appropriate, efficient, and simple accounting procedures and information processing through automated services over the Internet. Then, all parties engaged in accounting transactions and procedures would be AI-compliant and able to communicate information and trade. This approach applies to accounting education as well as enterprises. Technology is currently widely employed in accounting due to the emergence of artificial technological advances, apps for acquiring management information, and integrated accounting information systems (Li, & Zheng, 2018). Accounting professionals have already begun integrating technology into their daily work to increase efficiency and save time. In this case, they will be used to build AI systems. However, there are several benefits to doing so, such as the opportunity to accomplish goals through data-driven decision-making, the ability to learn about the organization's operations through data analytics, and the length of the process (Zhang et al., 2020). According to Qasaimeh et al. (2022), Jordanian commercial banks employ neural networks to boost the effectiveness of their AS and give management access to fundamental accounting data. Furthermore, Jordanian commercial banks stand out for using neural networks because of their capacity to evaluate data, improve employee performance and development, and give stakeholders and management information that aligns with consumer demands. The Haddad study's (2021) findings unequivocally demonstrate how AI affects AIS excellence in the Jordanian banking industry. The study demonstrated that because human intervention is necessary for banking systems to maintain control over banking financial policies, expert systems are created using human skills to handle accounting events and procedures. The results of Oduwole & Olukunle (2023) showed that the automation process, expect system and intelligent agents have a major impact on deposit money banks' accounting practices. Thus, it may be concluded that certain deposit money institutions benefit from artificial intelligence in their accounting practices. It was suggested that accountants and the banking sector may reduce unnecessary accounting expenses by strengthening their performance and understanding of artificial intelligence. Based on the above discussion, the following hypotheses were developed:

H_1: *Big data has an impact on the accounting system of Jordanian Islamic Banks.*

H_2: *Intelligent agents have an impact on the accounting system of Jordanian Islamic Banks.*

H_3: *Expert systems have an impact on the accounting system of Jordanian Islamic Banks.*

H_4: *Automation processes have an impact on the accounting system of Jordanian Islamic Banks.*

3. Methodology

The purpose of the current study is to ascertain how AI has influenced the development of AS in Islamic banks. The study population now includes Islamic banks. To establish the study sample size, the researchers developed a standardized table. Using a quantitative research approach, 128 workers of Islamic banks in Jordan were chosen as a sample for this study. Additionally, four constructs founded on the literature were used to measure the AI variable: big data, intelligent agents, expert systems, and automation processes in the Jordanian Islamic banks' AS. The study used a survey questionnaire instrument that was created based on past relevant literature and studies to collect the required data. To make it simple for respondents to select the appropriate answer, a five-point scale going from strongly agree to strongly disagree was employed. Fig. 1 shows the structure of the proposed study.

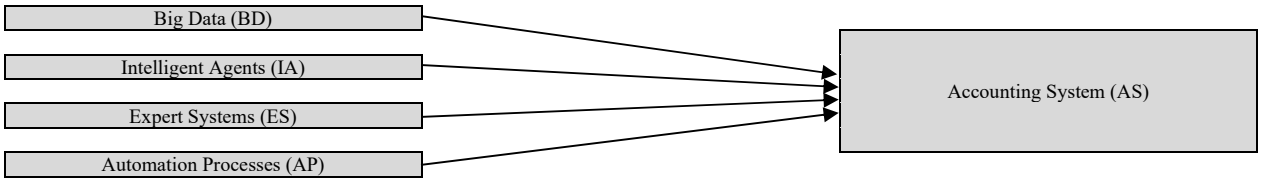

Fig. 1. Theoretical Framework of the proposed study

4. Results

The study was conducted in two stages: first, the validity and reliability of the constructed variable were evaluated using the measurement model, and then the hypotheses were investigated using the structural model. The results of the measuring model are summarized in Table 1.

Table 1
Measurement Model Assessment Results

Variables	Items	Mean	S.D	Cronbach's	CR	AVE
BD	BD1	3.98	0.62	0.842	0.721	0.546
	BD2	3.81	0.71			
	BD3	3.90	0.65			
	BD4	3.77	0.84			
IA	IA1	3.75	0.82	0.859	0.898	0.628
	IA2	3.80	0.76			
	IA3	3.90	0.59			
	IA4	3.88	0.64			
	IA5	3.83	0.70			
ES	ES1	3.82	0.72	0.807	0.872	0.687
	ES2	3.91	0.61			
	ES3	3.79	0.89			
	ES4	3.77	0.85			
AP	AP1	3.89	0.73	0.835	0.840	0.614
	AP2	3.75	0.88			
	AP3	3.94	0.63			
	AP4	3.96	0.60			
	AP5	3.76	0.77			
AS	AS1	3.80	0.67	0.864	0.831	0.589
	AS2	3.89	0.65			
	AS3	3.77	0.78			
	AS4	3.92	0.65			
	AS5	3.90	0.62			
	AS6	3.79	0.74			
	AS7	3.88	0.71			
	AS8	3.75	0.79			

The four markers that were utilized to quantify BD had mean values varying from 3.98 to 3.77. The calculated mean values varied from 3.90 to 3.75 using the same five indicators that were used to assess IA. In the meantime, the ES was assessed using four components, whose mean values varied from 3.91 to 3.77. Additionally, the five AP measures were used, and the mean values that emerged varied from 3.96 to 3.75. With mean values varying from 3.92 to 3.75, the eighth indicator was used to evaluate the dependent variable, the AS. This study made use of several popular tests that have been documented in the literature. The factor loadings are shown initially to demonstrate the validity of the items in this investigation. Factor loading levels must be higher than 0.7 to have strong signal validity; nonetheless, 0.4 is the lower acceptable value, and any indications with element loadings below 0.4 should be discarded. Additional measures of validity and reliability included Cronbach's alpha, AVE, and composite reliability (CR). The positive investigative results that surpassed the moderate cut-offs (AVE>0.50, CR >0.70, and Cronbach's alpha >0.7) are shown in Table 1. The measuring model's outcomes supported each assumption and verified the components. At the effectiveness level of (0.05), Pearson's correlation shows a statistically significant relationship between BD and AS, with a value of (0.881). At the effectiveness level of 0.05, the Pearson correlation approaches (0.000), suggesting a strong positive correlation between IA and AS (0.801). At the effectiveness level of 0.05, the Pearson correlation approach (0.000), signified a strong positive correlation between ES and AS (0.824). As Table 2 shows, there is a strong positive correlation between AP and AS, with an influential (0.000) Pearson correlation of (0.794).

Table 2
Pearson Correlation between Variables

Variables	BD	IA	ES	AP	AS
BD	-	0.769**	0.741**	0.789**	**.·881
IA		-	0.753**	0.748**	**.·801
ES			-	0.781**	**.·824
AP				-	**.·794
AS					-

Table 3
Hypotheses Testing

Hypotheses Testing		Path Coefficient	T	P	Decision
H1	Big Data BD→ Accounting System AS	0.512	4.048	0.001	Supported
H2	Intelligent Agents IA→ Accounting System AS	0.487	6.17	0.000	Supported
H3	Expert Systems ES→ Accounting System AS	0.690	5.81	0.000	Supported
H4	Automation Processes AP→ Accounting System AS	0.472	5.09	0.002	Supported

The structural model's most often encountered outcomes, path coefficients, T-value, and p-value, are used to validate the interaction between AI and the Jordan Islamic Bank's AS and to grasp the significance levels. BD, IA, ES, and AP all had a substantial influence on the evolution of the AS in Jordanian Islamic banks, as indicated by the direct impacts shown in Table 3 ($p \leq 0.05$).

5. Discussion and Conclusions

AI is essential to the AS ability to effectively manage accounting tasks within the company. Data analysis and interpretation in the accounting process is one of the most challenging jobs for big organizations, and using AI technology has excellent outcomes, including better productivity, better accuracy, and lower costs and turnaround times (Dongre et al., 2020). AI is being used in many different corporate operations, such as human resource management, research and development, allocation, procurement, sales and trade, accounting and finance, and audit. Since accounting and auditing are essential components of company operations, they are also subject to the advantages and drawbacks of AI (Hasan, 2021). Furthermore, utilizing AI-powered accounting software has reduced labor costs, strengthened process governance, boosted customer service, expedited productivity, and enhanced efficiency (Lee & Tajudeen, 2020). It should come as no surprise that as technology has grown, our needs have changed to the point where we prefer it to manual processes. This is especially true for businesses, who would rather adopt technology since it improves their prospects of expanding and surviving. This will eventually result in the elimination of the need for humans in the accounting industry since computers are far more precise and productive than people in this area, and they also cost far less to run and maintain (Mohammad et al., 2020). The current study seeks to identify the function of AI in the development of AS in Jordanian Islamic banks. The current study used quantitative research methods to choose a sample of 128 workers from Jordanian Islamic banks. To collect the essential data, the study used a survey questionnaire instrument created based on prior relevant literature. The findings suggested that AI (big data, intelligent agents, expert systems, and automation processes) has an impact on the development of Jordanian Islamic banks' AS. Accordingly, the researchers recommended that to improve AS tasks and reduce associated costs, accountants and accounting companies should always increase their understanding of AI.

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