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Research Paper

The Impact of Artificial Intelligence on Accounting Information Systems in Jordanian Banks: An Exploratory Study

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Abstract

Artificial intelligence (AI) has become one of the critical technological tools for enhancing the efficiency and quality of accounting operations, minimising human errors, and accelerating data analysis and decision-making processes. Thus, the purpose of the study is to explore the impact of AI on accounting information systems(AIS) within Jordanian banks. The study proposed a research model based on the related studies. A quantitative approach was employed, using a questionnaire for data collection. The sample consisted of staff from the financial services and audit departments of 15 Jordanian banks, including financial managers, internal auditors, heads of accounts, and accountants. Several statistical methods are used for data analysis, SEM was applied for data analysis using smartpls tool. The study found that AI has a considerable impact on the AIS system. In order to reap the benefits of AI, the study advises Jordanian banks to implement cutting-edge technologies based on AI and machine learning to improve accounting system performance. It is recommended that further research be conducted to get a more in-depth understanding of the variables influencing the interaction between AI and the AIS of banks.

Keywords:
Artificial Intelligence, Accounting Information Systems, Jordanian Bank, Expert Systems

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ورقة بحثية

أثر الذكاء الاصطناعي على نظم المعلومات المحاسبية في البنوك الأردنية: دراسة استطلاعية

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المستخلص

أصبح الذكاء الاصطناعي أحد أهم الأدوات التكنولوجية لتعزيز كفاءة وجودة العمليات المحاسبية، وتقليل الأخطاء البشرية، وتسريع عمليات تحليل البيانات واتخاذ القرارات. وبناءً على ذلك، تهدف هذه الدراسة إلى تقييم تأثير الذكاء الاصطناعي على نظم المعلومات المحاسبية في البنوك الأردنية. وقد اقترحت الدراسة أنموذجًا بحثيًا مستندًا إلى الدراسات السابقة ذات الصلة. واعتمدت الدراسة على منهج كمي، حيث تم استخدام الاستبيان بوصفه أداة لجمع البيانات. وتكونت العينة من موظفي أقسام الخدمات المالية والتدقيق في 15 بنكًا أردنيًا، بما في ذلك المديرين الماليين، المدققين الداخليين، رؤساء الحسابات، والمحاسبين. وتم استخدام عدة أساليب إحصائية لتحليل البيانات، إذ تم تطبيق نمذجة المعادلات الهيكلية (SEM) باستخدام أداة SmartPLS. وأظهرت نتائج الدراسة أن للذكاء الاصطناعي تأثيرًا كبيرًا على نظم المعلومات المحاسبية. ومن أجل تحقيق الاستفادة الكاملة من الذكاء الاصطناعي، توصي الدراسة البنوك الأردنية باعتماد تقنيات متقدمة معتمدة على الذكاء الاصطناعي لتحسين أداء نظم المعلومات المحاسبية. كما توصي بإجراء المزيد من الأبحاث لفهم أفضل للعوامل المؤثرة في العلاقة بين الذكاء الاصطناعي ونظم المعلومات المحاسبية في البنوك.

الكلمات المفتاحية:

الذكاء الاصطناعي، أنظمة المعلومات المحاسبية، البنوك الأردنية، الأنظمة الخبيرة

1. Introduction

Given the ongoing global developments and the transition into the modern technological era, there is a significant impact on human life, the search for means to obtain better performance for institutions, achieve higher profit, and excellence in achieving a competitive environment so that it depends on speed, flexibility, innovation and creativity in institutional work, and eliminating some obstacles such as lack or lack of information about their internal and external surroundings for institutions in general and in the banking sector in particular (Bani Irsheid, 2022; Hussain, F. 2024). Institutions are in dire need to take advantage of AIto improve their performance, achieve high-level administrative and accounting levels, and provide tremendous opportunities to facilitate and develop the organization's internal operations, as the adoption of AI applications and operations by institutions will be a weapon to stand in the face of future obstacles for the institution, and reach solutions that contribute to solving the problems of the institution's performance and facilitate the exchange of information and experiences, enhance speed and routine work, provide honest and accurate information, and seize it in strategic planning processes, which will increase The level of transparency in the organization, as it will pose a strong challenge to the organization's management systems and the ability to adjust them according to new circumstances and opportunities, which is one of the main success factors for modern organizations and their achievement of effective performance (Yawalkar ,2019) . One of the sectors most affected by this technological progress is the economy, particularly the accounting sector. As a result of these developments, there has been a marked improvement in financial data accounting and management techniques through the use of new computer systems established by banks. Since accounting systems are one of the primary sources of information in banks and businesses, they must adapt to these developments. Banks can now provide fast, reliable, secure, and integrated information to make strategic and operational management decisions. The efficiency of management and accuracy of the Bank's information play a key role in determining its performance. (Alathamneh ,2020).

1.1. Research problem

Although accountants have long relied on computers to enhance the efficiency and effectiveness of their work, technology has not yet replaced professionals' experience in decision-making, a critical necessity for many institutions, especially financial ones (Yusuf & Muyiwa, 2024). While technology has facilitated quality improvement and cost reduction, its impact is primarily limited to routine or low-skilled tasks. AIS are the cornerstone of banks' success, as advances in computer and AI technologies have enhanced bank management and accounting procedures (Ahmed et. al. 2025; Alathamneh, M.,2020). As a result, banks tend to use advanced technology such as artificial intelligence, which can carry out complex cognitive activities usually handled by highly qualified accountants. Companies of all kinds and sizes can now benefit from technology that saves accountants and professionals thanks to artificial intelligence. AI carries different risks, is viewed positively and negatively, and can use past experiences to predict future impacts. For example, these risks in banks involve

manipulating these systems, especially accounting systems (Geisel, 2018; Mpofu et al. 2024; Al-Qatanani, 2024), Moreover, for this, the research problem revolves around the following central question:

What is the influence of AI in its dimensions (machine learning, expert systems) on AIS in Jordanian banks? The next sub-questions comprise the main question:

1. How do expert systems impact Jordanian banks' AIS ?
2. How does machine learning affect AIS in Jordanian banks?

1.2. Objectives of the study

According to the study's problem, the study seeks to determine the influence of AI on Jordan's AIS in two areas (expert systems, machine learning). The objectives are:

1. Determine how expert systems affect Jordanian banks' AIS .
2. Determine how machine learning has affected Jordanian banks' AIS .

1.3. Related studies

The study of Nwankwo, (2023) aimed to facilitate the managerial activities towards improving performance by integrating AI with AIS . The study concluded that AI is essential for improving managerial and accounting procedures and streamlining them. It increases the efficiency of AIS . It is suggested that the organisations have to be more closely with software developers, AI specialists to create AI solutions that would enhance different accounting tasks like data entry, reconciliation, and reporting. Solikin & Darmawan (2023) explored using AI to improve public AIS efficiency within businesses. The study used a quantitative method to demonstrate how AI can be applied in public accounting. The study findings indicated a significant enhancement in AIS with the integration of AI techniques with AIS. Alshaer & Al-Hawamdeh, (2022) examined the AI applications impact organizational innovation in Jordan's commercial banks. Expert systems, neural network systems, and fuzzy logic employed in AI applications have adopted as a key factors of AI. Organizational innovation levels were evaluated in terms of management, process, and product innovation. The results revealed a remarkable level of organizational innovation along with AI applications, except neural network systems, which showed an average level. Furthermore, the results highlighted the significant impact of AI applications on regulatory innovation within Jordan's commercial banks, with reported the fuzzy logic emerging as a critical application. The study recommends keeping abreast of technological developments in AI applications, and integrating the AI applications into banking functions. The study of Qasaimeh & Jaradeh (2022) investigated using the AI for improving the application of cyber governance in Jordanian commercial banks. It seeked to determine the role of expert systems, neural networks, genetic algorithms, and intelligent agents influence cyber governance in Jordanian commercial banks and how these effects relate to commercial banks specifically. The findings indicated that to improve the efficient implementation of cyber governance , the banks in Jordan must increasingly use these AI technologies. Hermansyah, (2023) examined utilising AI in

the Indonesian SMEs. It is reported that using AI in SMEs needs a legal framework and strategy for error management.

2. Theoretical framework and Hypothesis formulation

2.1. Artificial Intelligence (AI)

AI is developing rapidly and providing insight into human intellect by developing computer programs that mimic human behavior and electronic task processing. AI also helps to supply financial data and information to users, both internal and external, who require it in order to make decisions quickly. Information systems are now a crucial part of corporate and bank governance, making the growing significance and evolution of ICT's strategic role one of the field's most significant current developments. It is a crucial tool used to initiate financial and administrative procedures, enhance decision-making, and elevate the caliber of performance. (Jaradeh & Qasaimeh, 2022)

AI performs better than natural intelligence in many areas, including processing and deployment speed, robustness, and stability. Compared to humans, AI can capture every move and specific task performed more quickly and accurately. AI speeds up problem-solving and simplifies IT process management in complicated IT environments.

AI is described as a collection of models and technologies used to create computers that can replicate human intellect. These computers use technology to create and share cutting-edge information and accomplish objectives. AI also depends on creating intelligent programs to think, learn, and assimilate information. These programs interact with their surroundings to carry out challenging tasks. AI can also mimic human behavior, mental processes, and astute decision-making. (Al-Hawamdeh & Alshaer, 2022).

2.2. AI in the banking sector

The banking sector has seen a surge in technical advancements, which has created new avenues for enhancing customer service by providing banking services over e-transactions that save effort, money, and effort (Prasetianingrum, & Sonjaya, 2024). These cutting-edge technologies have drastically altered the way banks function. However, the fear of cyberattacks that could interfere with essential financial services has increased security and protection concerns in this setting. Consequently, to improve the integrity of their financial systems, banks have started implementing cybersecurity and governance measures. AI has grown significantly in accounting to alter governance and accounting performance. The rise of synthetic technology and technological advancements provides the perfect atmosphere for its use. (Haddad, 2021).

2.3.Accounting Information Systems (AIS)

This subset of information systems focuses explicitly on managing an organization's accounting and financial data. This includes efficiently recording, processing, storing, and disseminating data. The AIS integrates detailed accounting knowledge, business processes and technology in order to enhance productivity and provide accurate and timely financial information for decision-making, data preparation and reports, and establish internal control, and according to Sari et al. (2019), AIS comprises a collection of interconnected elements, tools, and processes, including: This includes hardware and software that help process and analyze financial data and ensure that it is controlled and provided promptly according to need (Nwankwo, 2023).

2.4.Using AI for Accounting Information Systems

AI promotes the use of computerized records, audits, and tax procedures, and helps detect and prevent fraud (Eskandarzadeh *et.al*. 2024). AI in accounting is important as accountants can devote their attention to tasks that require human skills, while delegating routine tasks to AI. AI helps accountants handle complex numbers and data and contributes to improved auditing and error identification. Artificial intelligence, which is employed in various industries including business, medical, education, home automation, and social research, is a significant change in AIS . (Solikin & Darmawan, 2023).

2.5.Proposed Research Model and Hypothesis Formulation

This study aims to explore the impact of AI according to it's specific dimensions in the context of this study, namely expert systems and machine learning. The central hypothesis of this study is that there is a statistically significant impact of artificial intelligence, namely in its dimensions of expert systems, machine learning on AIS in Jordanian banks. The threshold of significance for this study is set at a ≤ 0.05.

2.5.1. Expert systems (ES)

An expert system is a kind of AI that has been developed to simulate the ability of a human expert in a certain field to solve problems or make decisions. The purpose of an ES is to deliver suggestions, advice, or even make decisions, as a human expert would (Chytrý et al. 2020). Desai et. al. (2023)'s study confirmed that the expert system has a major role in financial and accounting activities. For example, the use of expert system in auditing improves the evaluation of risks related to financial reports. ES were also beneficial in detecting fraud. Accounting activities based on expert system represent a radical shift from traditional accounting practices, It simulate analytical thinking and problem-solving skills of human accountants (Berdiyeva et. al. 2021). According to that, the hypothesis is formulated as follows: *Expert Systems has a*

statistically significant positive influence on AIS in Jordanian banks, with a significance level of a ≤0.05.

2.5.2. Machine Learning

Machine learning is a branch of AI. It is a computational technique that learns patterns from big, complex data. These learning procedures enable us to predict future events (Cho et. al. 2020). In accounting, machine learning is increasingly being applied to diverse tasks, such as reviewing documents, analysing transactions or business activities, and evaluating risk (Ding et. al. 2020).The results of Bavaresco, et. al. 2023 study showed that employees agreed that using machine learning in accounting activities can reduce the time required to perform these tasks. According to that, the hypothesis is formulated as follows: *Machine Learning has a statistically significant positive influence on AIS in Jordanian banks, with a significance level of a ≤0.05.*



Figure 1. Proposed research Model

3. Methodology of the Study

An analytical descriptive approach will be utilized to determine the impact of AI on the AIS in Jordanian banks and meet the study's objectives. The questionnaire tool will be used to gather data to describe and analyze the effects of AI on the information systems in Jordanian banks. Preliminary data, this approach will be used to describe the characteristics of financial and audit management staff who fall under the following functional designations: (Chief Financial Officer, Internal Auditor, Head of Accounts, Accountant) by demographic variables. Respondents' demographic characteristics will be analyzed, and hypotheses will be tested using appropriate statistical analysis methods.

3.1. Study and Sample Society

Fifteen Jordanian banks comprise the study community. The Finance and Audit Services personnel, who have the following functional titles: Financial Manager, Internal Auditor, Head of Accounts, and Accountant, make up the Inspection Unit. The study's sample comprised Jordanian banks' financial departments and audit service employees. Jordanian Banks' Financial Department and Audit Service employees will receive the survey.

3.2.Data sources

The following sources will be used to provide information on study variables in order to meet the study's objectives**:**

Secondary sources: these pertain to the gathering of theoretical data and comprise Arabic and international scientific publications, reviews of published studies and articles, and specialized research and studies on the topic of the study. The study will concentrate on accounting data and artificial intelligence. Systems in the development of the conceptual model.

- Primary sources: To provide preliminary data, the identification (study tool) will be prepared according to the approved scientific bases, based on the **theoretical framework and previous studies in its preparation.**

3.3.Stability of the study instrument

The study tool's consistent goals are to assess internal consistency and to stabilize and predict the results gradually—that is, the compatibility or consistency of the questionnaire's results—because they have been used repeatedly in comparable situations. The internal constant factor between answers, or alpha, can be understood as the consistency of the sample individuals' responses to all scale questions. A high value of alpha suggests a high degree of stability. Alpha Cronbach's will be employed to quantify this consistency. High stability is falling between 0.1 and 60 percent and above. The Alpha Cronbach formula will evaluate every aspect of the instrument in other studies, with a minimum of 70 percent or above.

Table (1) Alpha-cronbach's internal persistence factor for each section of the research tool and the tool overall Field Internal Consistency Stability Factor (Alpha Cronbach).

3.4. View statistical results

3.4.1. Assessment of Measurement Model

The current study examined the stability and consistency of the model's internal consistency to evaluate the external model, known as the measurement model (Hair et al., 2017).

3.4.2. Internal Consistency Reliability, and Convergent Validity

The model's composite stability was tested to measure internal consistency. Table 1 shows that all values are above .60, which meets the criteria (Sarstedt et al., 2019). Similarly, the convergent validity was clarified by Hair et al. (2017) as "the

degree to which latent construction explains its different indicators". Furthermore, Table 1 shows that 50% of each variation is achieved by each construction (i.e., AVE is equal to or greater than 0.50), which is higher than the threshold value provided by Hair et al. (2017).

Table (1). Validity and reliability results

Construct	Items	loading	Composite Reliability (CR)	Average Variance Extracted (AVE)
Expert systems	ES1	0.826	0.918	0.736
	ES2	0.874		
	ES3	0.875		
	ES4	0.856		
Machine learning	AML1	0.828	0.891	0.672
	AML2	0.842		
	AML3	0.769		
	AML4	0.838		
Accounting Information System	AIS1	0.798	0.954	0.635
	AIS2	0.858		
	AIS3	0.793		
	AIS4	0.803		
	AIS5	0.804		
	AIS6	0.809		
	AIS7	0.735		
	AIS8	0.838		
	AIS9	0.879		
	AIS10	0.778		
	AIS11	0.780		
	AIS12	0.662		

2.4.3. **Discriminant Validity**

The definition of discriminating validity is given by Fornell and Larcker (1981) using the square root of AVE. Furthermore, Fornell and Larker (1981) postulate that the discriminatory value of AVE should be demonstrated by its square root value being bigger than the underlying variables. Table 2 shows that all country values exceed the other underlying variables. In addition, the second criterion is to assess the validity of the formulations provided by Gold et al. (2001) and Klein (2015), which include the two commonly used parameters with HTMT.85 cutting points and HTMT.90, respectively, to assess HTMT values. The values in Table 3 are lower than the threshold values.

Table (2). Discriminant validity matrix (Fornell-Larcker Criterion)

	Accounting Information System	Machine Learning	Expert Systems
Accounting Information System	7.790		
Machine Learning	90.60	20.80	
Expert Systems	414.-0	532.-0	0.858

Table (3). Heterotrait-Monotrait ratio of correlations (HTMT*)*

	Accounting Information System	Machine Learning	Expert Systems
Accounting Information System			
Machine Learning	0.769		
Expert Systems	0.445	0.608	

3.4.4.Structure Model

Evaluating the structural model came next, after the measurement model. Sarstedt et al. (2019) stated that internal modeling is provided in a structural model by considering track transactions and t-values for direct relationships. Moreover, poetry et al. (2017) suggested that t's value should be greater than 1.96 to determine the important relationship and be used more in decision-making on the abovementioned hypotheses. The study's structural model is displayed in Figure 2.

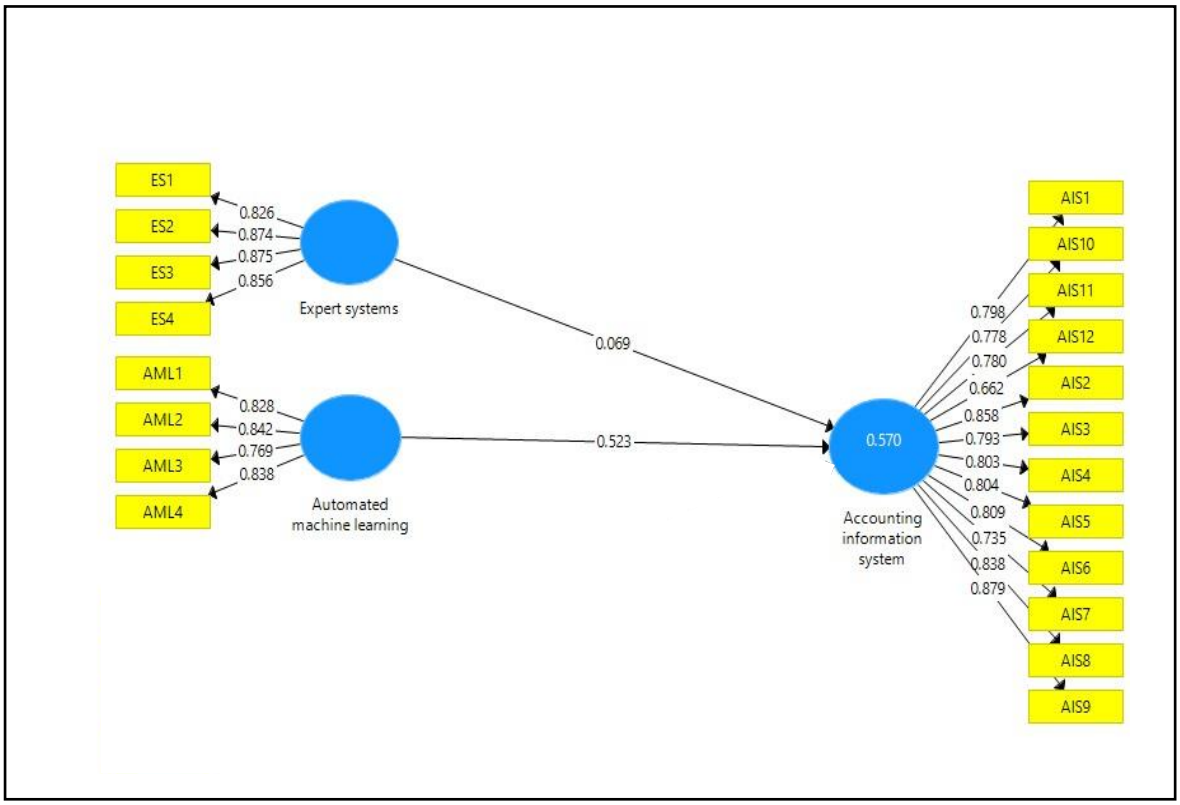


Figure (2). Assessment of the structural model

3.4.5. Assessment of Structural Model

The results of the hypothesis test are shown in Table 4, where hypotheses with t values larger than 1.96 were supported. Thus, the current investigation supported two of the three direct link hypotheses. The third direct hypothesis is unsupported; there is no positive significance in the direct impact of expert systems (ES) on AIS (beta value = 0.069; T = 1.350Ÿ p >.05). In a similar vein, the outcome supports the first hypothesis, which states that machine learning (AML) significantly improves the accounting information system (AIS) (beta = 0.523; T = 8.398Ÿ p <.05). Furthermore, simplicity of use had a direct moral impact on the accounting information system (beta = 0.069; T =5.287Ÿ p <.05), supporting the second hypothesis.

Table (4). Hypothesis testing results

Relationship	Std. Beta	T Values	P Values	Decision
ML => AIS	0.523	8.398	0.000	Supported
ES => AIS	0.069	1.350	0.178	Not Supported

Note: ML = Machine learning, ES = Expert systems, AIS =Accounting information system.

Assessment of Coefficient of Determination (R^2), Effect Size (f^2), and Predictive Relevance (Q^2)

The determination coefficient (R2) describes the degree of variation caused by all external variables in the internal variable. In addition, Hair et al. (2019) present the threshold values of the appropriate factor for identification values as .75 as a great value, .50 as a middle grade, and .25 as a poor degree. The value presented in Table 5 predicted that the internal variable determination factor (the accounting information system) had an average predictive accuracy.

Table (5). The coefficient of determination and effect size

Construct	R2	f2	Q2
Accounting information system (AIS)	0.570		0.356
Machine learning (ML)		0.400	
Expert systems (ES)		0.007	

After analysing the determination factor (R2), it is necessary to examine the effect size (f2) of all the variables inherent in the study. To measure a given model's impact size (f2), threshold values range from .02 f. 15 f. 35 for non-medium and high impact sizes. The current study showed no median impact volume of the studied model. Similarly, the level of acceptance of predictive importance (Q2) above 0 indicates that external variables have a predictive significance for internal variables of the model (Hair et al., 2019). Thus, in Table 5, we can find that the value of Q2 = .356 is greater than zero. Therefore, the current research model is of sufficient predictive importance.

3.4.6. Results

After the implementation of the study procedures by systematic scientific methods, a set of results was reached, and the following is a presentation of them:

- The central hypothesis regarding the significant effect of AI in its various dimensions on AIS in Jordanian banks has been confirmed.
- The results show that machine learning significantly impact AIS , supporting two of the three primary hypotheses that were put out.
- There was no evidence supporting the direct relationship between accounting information and expert systems.
- The significance of implementing cutting-edge technology in this sector is highlighted by the notable and advantageous effects of machine learning on AIS .

4.Conslusion and Recommendations

This study aimed to investigate the effect of AI on AIS. The study proposed a research model according to the related studies. The main dimensions of AI in the context of the study are expert systems and machine learning. Quantitative approach has been adopted by using a questionnaire tool for data collection. . The sample consisted of staff from the financial services and audit departments of 15 Jordanian banks, including financial managers, internal auditors, heads of accounts, and accountants. The findings showed that the machine learning significantly impacts AIS . while, the expert systems don't appear to have any influence on AIS . The study recommends that Jordanian banks investigate and implement cutting-edge technologies, such as machine learning and specialised AI systems, to improve the efficiency of their accounting systems. To get the most out of AI technologies, banks should keep developing and improving the user interfaces for their accounting systems. To better understand the variables influencing the interaction between expert systems and banks' AIS , more research is advised.

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