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-RESEARCH ARTICLE-

THE IMPACT OF ARTIFICIAL INTELLIGENCE ON ACCOUNTING PERFORMANCE: SUSTAINABLE DEVELOPMENT AS A MEDIATING VARIABLE

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─Abstract─

The UN plans to achieve several development objectives by 2030. These objectives address global warming, a major issue. This method aims to improve sustainable accounting performance (AP). In this circumstance, AI is being applied in various fields, notably in economic, social, and environmental (ESE) domains. This research investigates how sustainable development (SD) influences AI methodologies and AP improvement. The research examined a sample of Iraqi banks listed on the Iraq Stock Exchange from 2014 to 2022. AI was measured by ATM and POS prevalence. A three-dimensional approach examined economic, social, and environmental (ESE) sustainability. Meanwhile, the performance of sustainable accounting was measured through the return on assets (ROA) index. The findings of this study revealed a general weakness in the AP of Iraqi banks during the study period. However, it was found that the integration of AI dimensions contributes significantly to achieving SD and enhancing AP. Furthermore, the study demonstrated that SD, in turn, plays a critical role in improving the level of AP. These results highlight the importance of adopting AI-driven technologies within

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the banking sector to promote sustainability and strengthen accounting outcomes. Additionally, the study emphasizes the need for a deeper focus on SD as a vital intermediary that links technological advancements to improved organizational performance. This research offers valuable insights for both policymakers and financial institutions striving to achieve the United Nations' SD goals by 2030, particularly in regions facing similar challenges to those in Iraq.

Keywords: Performance, Accounting Performance, Sustainable Development, Intelligence of Artificial

INTRODUCTION

Accounting helps financial management, decision-making, and performance assessment, thereby playing one of the basic responsibilities of corporate operations. Businesses must be able to expand and compete in the fast changing environments of today. But the constantly complicated and dynamic nature of accounting is posing major difficulties for practitioners (Hutahayan, 2020). Businesses trying to keep their competitive edge and experience sustained economic development must first address these difficulties. Driven by artificial intelligence, automation provides a solution by changing financial processes, lowering the time and resources required, and helping to fulfill Sustainable Development Goals (SDGs) (Peng et al., 2023). Driven by commercial objectives, the industrial revolution historically resulted in more demand for automation and more resources, therefore generating considerable waste and environmental damage (Hutahayan, 2020). New worldwide solutions have been required by the concurrent population boom, growing demand, more consumption, and higher expectations for products and services. These methods try to increase manufacturing capacity by integrating cutting-edge technology. Rapid progress has been made in artificial intelligence (AI), which entails the creation of computers capability of doing jobs typically performed by humans (Lois et al., 2020).

AI fundamental objective is to replicate and mechanize human intellect thereby increasing its reach in many spheres. AI-enabled computers can replicate human cognitive processes, make decisions, and provide problem-solving capability (Oberoi et al., 2021). Particularly automation, the integration of 21st-century technology has transformed manufacturing and industrial production processes, thereby benefitting many developed nations (Zhang et al., 2020). By encouraging interactions between people, machines, and the natural surroundings (Yilmaz, 2021), artificial intelligence marks the next phase of this development. From communications to health to engineering to sustainability, artificial intelligence has advanced many different disciplines. Like other sciences, its impact on accounting has become somewhat significant, particularly in tackling development issues

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concerning the SDGs (Di Vaio et al., 2020). Real-time observation, interpretation, and reaction capability of artificial intelligence systems—such as those able to identify human gestures or pedestrians—helps them to revolutionize sectors like environmental modeling, public health, transportation, and precision agriculture. These intelligent systems are also projected to be very important for environmental management, manufacturing, protection of biodiversity, and projects meant to support world prosperity (Leal Filho et al., 2023; Singh et al., 2024; Vinuesa et al., 2020).

Major companies and governments all over are developing artificial intelligence (AI), which is progressively becoming a mainstream technology in many different fields like banking, healthcare, criminal justice, national security, transportation, and smart city development. Many times, artificial intelligence has enhanced human capacities and had significant effects on worldwide systems (Musleh Al-Sartawi et al., 2022). However, considering the societal implications of these technologies, it is crucial to understand the AI systems being developed, as they are set to disrupt several industries (Mhlanga, 2022). Goralski and Tan (2020) also emphasize that AI is rapidly entering new territories in business, government policy, and corporate practices. Automation combined with deep learning is already reshaping industries, governments, and societies. Given the significant effects financial crises can have on companies and economies, crisis forecasting is gaining attention. Reliable forecasting models can help managers mitigate financial risks and achieve SDGs (Bebbington & Unerman, 2020). To transition from short-term profitability to long-term sustainability, businesses must now prioritize SD practices, encompassing economic, environmental, and social aspects (Lee et al., 2020).

This study focuses on the financial performance of Iraqi banks listed on the Iraqi Stock Exchange, which have been historically weak in terms of both financial performance and social responsibility. Several studies have previously addressed these issues in the Iraqi context (Hadi et al., 2023). As the United Nations advocates, globally listed companies are now required to regularly submit sustainability reports. However, in emerging economies like Iraq, there is limited data on the quality of sustainability performance. With the Iraqi government moving towards financial inclusion in line with the Central Bank of Iraq's requirements, AI methods have been adopted by Iraqi banks to support their performance and activities. Despite these efforts, many banks continue to struggle with poor performance. This study seeks to address the research gap by investigating the following research question: "How can AI enhance the financial AP of Iraqi banks and contribute to achieving SDGs?" Using data from Iraqi banks, this study employs a quantitative research approach to analyse the relationship between AI and AP. A systematic methodology is used to minimize bias and enhance the reliability of the findings, and data is analysed using the SPSS program. The study is structured as follows: a literature review and development of hypotheses, a detailed explanation of the

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methodology, a presentation and discussion of the findings, and finally, the conclusions.

LITERATURE REVIEW AND HYPOSIS DEVELOPMENT

Sustainable Development in Accounting Performance

The concept of financial and AP is one of the most frequently discussed topics in both academic and professional fields due to its critical role across industries (Cho, 2024). Although AP is used extensively, its definition has many connotations that show its adaptability in different environments. Particularly since the 1980s, when numerous academics started to investigate and define the phrase "company performance," it has been fundamental in accounting studies. This endeavor has produced a variety of interpretations, usually molded by the particular emphasis of various research projects. Traditionally, AP and financial measures have been based only on financial and accounting criteria such profitability ratios, profits per share, and return on assets. More recently, however, the idea of performance has spread in the management literature, where it is now being used to assess a company's application of SD strategies (Lahouirich et al., 2022). The fast changes in many spheres over the last several decades have had major detrimental effects on the environment, which has resulted in a worldwide reassessment of corporate policies. These bad effects compromise not only the present generation but also the welfare of future generations. Global focus has therefore turned to the implementation of SD practices to maintain environmental health, guarantee the sustainable use of resources, and defend the rights of future generations (Vinuesa et al., 2020).

Growing influence of global warming and other environmental issues has driven companies to be more and more urged to follow sustainable development policies. Rising environmental, social, and financial concerns have driven public interest in sustainability to explode, thus many managers and investors have realized they must match profit-seeking operations with SD concepts (de Castro Sobrosa Neto et al., 2020). Scholars still argue about the association between SD and AP in spite of this change; some agree on the favorable results while others propose other conclusions (Bartolacci et al., 2020). Chang and Kuo (2008) conducted a noteworthy research looking at whether implementing SD-compliant policies influences company performance. Against several accounting criteria, they gauged the effect of SD by comparing corporations included on the Dow Jones Sustainability Index (DJSI) with the Dow Jones Global Index (DJGI). The research found that organizations ranked on the DJSI and DJGI show varying performance levels; these variations may be ascribed to their SD strategies. Though long-term advantages may exist, the researchers also observed that SD techniques usually have a detrimental short-term effect on financial performance (Kim et al., 2022).

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However, Chang and Kuo (2008) found the opposite effect of social, environmental, and financial sustainability on enterprises. Their findings suggest that sustainable enterprises are more profitable. In South African enterprises, Groenewald and Powell (2016) found a positive association between sustainability and financial performance. Gómez-Bezares et al. (2017) found that companies incorporating sustainability into their operations had better financial performance and shareholder value, validating this relationship. In Vietnam, Tian et al. (2020) examined how environmental sustainability and corporate social responsibility affect financial performance. Their study confirmed this relationship and stressed the need of sustainability in economic development. Lee et al., (2020) reiterated the direct and indirect effects of SD practices on financial performance, particularly via employee happiness, customer loyalty, and brand acceptance (Yadav et al., 2022).

Lassala et al. (2021) showed that enterprises that practice social responsibility and follow the UN SDGs may gain a competitive advantage by focusing on the triple bottom line of economic, social, and environmental benefits. Zhou et al. (2022) found that improving enterprises' environmental, social, and governance (ESG) performance may boost their market value and financial success. Finally, Appannan et al. (2023) demonstrated that enterprises may increase environmental performance by merging accounting management with environmental policies. Though short-term and long-term outcomes vary, evidence suggests a growing correlation between SD behaviors and financial success. Successful SD strategy alignment benefits businesses' reputation, long-term sustainability, and profitability (Nureldeen et al., 2023).

Artificial Intelligence; Sustainable Development and Accounting Performance

A recent study by Singh et al. (2024) discovered a gap in studies on AI's role in SDGs. The authors concluded that although this topic is crucial now, not enough research addresses how artificial intelligence research serves the SDGs. Researching AI's role in SD is becoming more important because to its widespread effects on numerous businesses. Di Vaio et al. (2020) conducted a bibliometric research of 73 publications published between 1990 and 2019 on how AI helps SMEs achieve SDGs. Their study is one of several on this intersection. In light of the UN's 2030 Agenda for SDGs, where AI's development is linked to Goal 12 on responsible consumption and production, the findings show that AI's innovation challenge is ethical, social, economic, and legal. Vinuesa et al. (2020) illustrated how AI-based solutions may assist achieve 134 SDGs by fostering a long-term perspective. They also noted that unchecked artificial intelligence may compromise ethics, safety, and transparency (Najiand et al., 2022).

Palomares et al. (2021) examined AI-based technologies' pros, cons, possibilities, and threats for each SDG using SWOT analysis. AI efficiency may help achieve the

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SDGs by 2030, according to their research. Hannan et al. (2021) evaluated AI's use of renewable energy to accomplish the SDGs. They found that artificial intelligence may assist reach 75 SDGs using renewable energy, but it may hamper 27 others. The human-centered approach to AI in accomplishing SDGs was addressed by Mhlanga (2022), who stressed the necessity for AI systems that benefit humans. Mhlanga's literature assessment indicated that human-centered AI may best serve social aims. Musleh Al-Sartawi et al. (2022) suggested considering AI's promise and limitations for tackling sustainability concerns (Muthuswamy & Akilandeeswari, 2023).

Peng et al. (2023), examined AI's role in accounting, financial reporting, auditing, and decision-making and found that data-driven decisions aligned with SDGs 9 (Industry, Innovation, and Infrastructure), 16 (Peace, Justice, and Strong Institutions), and 17 (Partnerships for the Goals) could improve corporate sustainability. Singh et al. (2024) highlighted the expanding use of AI in several fields to fulfill the SDGs internationally. AI applications are crucial to SDGs 3 (Good Health and Well-Being) and 7 (Affordable and Clean Energy). AI is also used to accomplish SDG 16 (Peace, Justice, and Strong Institutions), SDG 11 (Sustainable Cities and Communities), SDG 13 (Climate Action), and SDG 4 (Quality Education). Their paper details how AI helps achieve these aims. Leal Filho et al. (2023) studied SD research and AI literature. Their study found many ways artificial intelligence may advance environmental studies and promote sustainability. Bonnet et al. (1985) proposed that AI's purpose is to reproduce human intellect in computers, providing a more complete understanding of AI's performance effects. Bonnet's study shows that artificial intelligence focuses on understanding human or machine task performance rather than speeding up operations.

Other study addresses AI's direct performance impacts. Odoh et al. (2018) found that southern Nigerian accounting processes have improved due to AI. In a similar line, Wamba-Taguimdje et al. (2020) observed that AI-reorganized organizations fared better. Hashem and Alqatamin (2021) say artificial intelligence increases automated information systems' trustworthiness, credibility, and comparability, which boosts performance. Beyond financial gain, artificial intelligence helps firms get insight into their strengths and weaknesses to improve. Berdiyeva et al. (2021) evaluated the literature and concluded that AI systems improve financial and accounting performance. Given the many research showing AI's influence on SD and performance, this study proposes the following:

H1: *An Iraqi Banks AI practices will have a positive effect on its AP.*
H2: *An Iraqi Banks's AI will have a positive effect on its SD.*
H3: *An Iraqi Banks SD practices will have a positive effect on its AP.*

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H4: *An Iraqi Banks AI practices will have a positive effect on its AP under the mediating role of SD.*

MATERIAL AND METHODOLOGY

Sample

In this study, the research community consists of the Iraqi banks listed on the Iraq Stock Exchange, totalling 44 banks. To analyse the role of AI in enhancing financial AP and achieving SD, a sample of 10 banks was selected. The selection criteria included banks capable of providing AI-supported banking services, regardless of their performance levels, and banks that contributed to achieving SD during the research period (2014–2022). This approach ensures that the study focuses on banks with active involvement in AI implementation and SD efforts. To ensure the study's statistical validity, a power test was conducted to determine the optimal sample size needed to detect the desired effect size. According to Table 1 (referenced), the power analysis indicated that 125 annual observations would be sufficient for testing the study's hypotheses, given a 5% significance level, a 99% power level, and a high expected effect size, which aligns with other administrative studies. The study currently has 171 observations, which exceeds the minimum required sample size, further reinforcing the accuracy and robustness of the findings that will emerge from the analysis. This excess in the number of observations adds credibility to the research results by reducing the likelihood of Type II errors (failing to detect a real effect) and ensuring that the conclusions drawn from the data will be reliable and reflective of the actual dynamics between AI, financial performance, and SD in Iraqi banks.

Table 1: Initial Statistical Power for Sample Size

First Equation	Minimum Required Sample Size for Study
Anticipated Effect Size (f2):	0.15
Desired Statistical Power Level (p):	0.99
Number of Predictors:	6
Probability Level (α):	0.05
Minimum Required Sample Size:	125

Variables Measuring and Mathematical Model

In this study, three core variables form the basis of the research model, as illustrated in Figure 1. These variables are categorized into independent, mediating, and dependent variables, each contributing to understanding the relationship between AI, SD and financial AP in Iraqi banks. In Table 1, the method of measuring these research variables is presented. Each variable is operationalized to ensure it can be quantified and analysed statistically. For instance, the availability and use rates of

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these technologies in banking operations help to gauge artificial intelligence aspects (ATMs and POS). Specific criteria reflecting a bank's commitment to sustainable practices help to quantify SD components (economic, social, and environmental). At last, AP is assessed using the widely used metric in financial performance research, the ROA. With SD functioning as a possible mediator in this link, the study intends to investigate the relationships between these variables and evaluate how artificial intelligence affects both SD and AP by organizing the research model in this way.

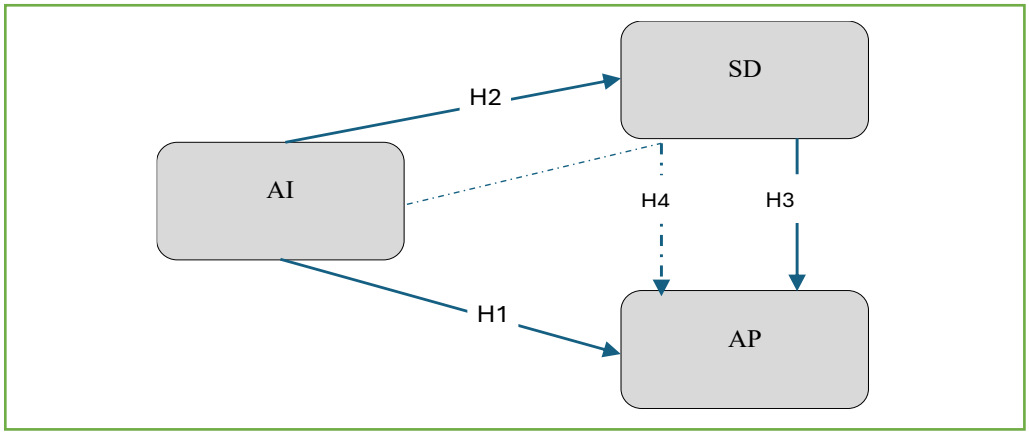

Figure 1: Search Model

Table 2: Measurement of Research Variables

Variable	Description	Measurement
Dependent Variable: Accounting Performance		
ROA	Return on Assets	Ratio between the net income and the Assets.
Independent Variable: AI		
ATMs	1— If it exists; is 0—if not.	
POS	1— If it exists; is 0—if not.	
Mediating Variable: Sustainable Development		
SUD1	Economic	1—if the SD is existing; 0—if not.
SUD2	Social	1—if the SD is existing; 0—if not.
SUD3	Environmental	1—if the SD is existing; 0—if not.
Variables Control		
Company Size	It is measured by the logarithm of total assets.	
Financial Leverage	It is measured by total debts to total assets.	
Sales Growth Rate	It is measured by the change in sales of the current year to sales of the previous year.	

Measurement of the mathematical models now includes three control variables: firm size (AL-Shboul, 2024), financial leverage (Rahman et al., 2020), and sales

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growth rate (Afiary et al., 2024). Rather than AP (Murtiningrum & Wahyuningsih, 2024), the dependent variable is return on assets. The return on total assets ratio gauges the percentage of the company's assets that support profitability, therefore determining ROA. The best instrument available to assess the capacity of the company's assets to provide highest returns on capital investments is this one. Empirical research have extensively used ROA to control performance level (Suharyanto et al., 2024). Through the amount of disclosure of ESE operations (Erin & Olojede, 2024; Lezeta et al., 2024) in the financial statements of Iraqi banks, SD is computed using a dummy variable (0,1). Equation 1 helps one to determine the link between SD and AP.

$$\mathrm{ROA_{it}} = \mathrm{A_{it}} + \sum_{k=3}^{K} \mathrm{SUD_{it}^{k}} + \mathrm{Sizefirm_{it}} + LEV_{it} + \mathrm{SGR_{it}} + \epsilon_t \quad (1)$$

AI is measured through a dummy variable (0,1), through the availability of ATMs and POS. The relationship between AI and AP is measured through Equation 2.

$$\mathrm{ROA_{it}} = \mathrm{A_{it}} + \sum_{C=2}^{C} \mathrm{AI_{it}^{C}} + \mathrm{Sizefirm_{it}} + LEV_{it} + \mathrm{SGR_{it}} + \epsilon_t \quad (2)$$

Based on Models 1 and 2, we present the structural model of the study in its simplified form as in Equation 3.

$$\mathrm{ROA_{it}} = \mathrm{A_{it}} + \sum_{k=3}^{K} \mathrm{SUD_{it}^{k}} + \sum_{C=2}^{C} \mathrm{AI_{it}^{C}} + \mathrm{Sizefirm_{it}} + LEV_{it} + \mathrm{SGR_{it}} + \epsilon_t \quad (3)$$

Where:

$\mathrm{ROA_{it}}$	The level of AP of bank i in year t**.**
$\sum_{k=1}^{K} \mathrm{X_{it}^{k}}$	Represents, the vector of SD in bank i in year t. Which is expressed using three dimensions (economic, social, and environmental dimensions).
$\sum_{C=1}^{C} \mathrm{AI_{it}^{C}}$	Represents, the AI vector at bank i in year t. Which is expressed using two dimensions: (ATMs, and POS).
$\mathrm{Sizefirm_{it}}$	Size of bank i in year t.
LEV_{it}	Financial leverage of bank i in year t.
$\mathrm{SGR_{it}}$	Sales growth rate of bank i in year t.

RESULTS

Descriptive Results

We show in Table 3. Descriptive statistical results. The results in Table 3 indicate

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that the arithmetic mean value of the dimensions of AI (ATMs, and POS) was .66 and .71, respectively, while its values for SD (economic, social, and environmental) were .67, .32, and .78, respectively. As for AP, it reached .048. The median values for the AI dimensions (ATMs, and POS) were 1.00 for both dimensions. For SD (ESE), the median was 1.00 for the economic and legal dimensions, while the median was 0.00 for the social dimension. As for AP, it reached .01. The median values indicate that the intermediate variables reflect relatively high levels of the dimensions of AI and the economic and legal dimensions of SD, except for the environmental dimension, which indicates the interest of Iraqi banks in adopting AI and SD techniques. The values of the standard deviation coefficient for the dimensions of AI (ATMs, and POS) were .47 and .45, respectively, while their values for SD (economic, social, and environmental) were .47, .46, and .41, respectively, and these values are close to the values of the dimensions of AI, which indicates a decrease in the dispersion of the collected data. As for AP it reached .15, which is the best deviation coefficient value compared to the rest of the values of the results of other variables.

Table 3: Descriptive Statistics

Variable	Unit	Obs.	Mean	Median	Std. Dev.	Min	Max
Dependent Variable							
ROA	Scale	171	.0488	.0100	.15141	-.04	1.22
Mediator Variables							
SUD1	Dummy	171	.6725	1.0000	.47067	.00	1.00
SUD2	Dummy	171	.3216	.0000	.46848	.00	1.00
SUD3	Logarithm	171	.7836	1.0000	.41298	.00	1.00
Independent Variables							
ATMs	Dummy	171	.6608	1.0000	.47482	.00	1.00
POS	Dummy	171	.7193	1.0000	.45066	.00	1.00
Control Variable							
Size firm	Logarithm	171	11.5431	11.7200	.78722	8.52	12.90
LEV	Scale	171	.4606	.4400	.28481	-.94	2.98
SGR	Scale	171	-.0125	-.0500	.44665	-1.70	1.90

Inferential Results for the Structural Model

Test of Model Fit

The collinearity test was conducted to ensure the robustness of the model by checking for potential multi collinearity issues between the variables. Collinearity occurs when two or more independent variables in a regression model are highly correlated, which can inflate the variance of the coefficient estimates and make it difficult to assess the effect of each variable independently. Table 4 shows that there is no significant collinearity between the main variables of the model. This was confirmed through the analysis of the correlation coefficients, which indicate that

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the variables are not highly correlated. This suggests that the model is free from multi collinearity issues, which enhances the reliability of the statistical analysis and the interpretation of the results. The Cronbach's Alpha (C.A.), rho_A, and Composite Reliability (C.R.) values were all statistically sound, indicating strong internal consistency and reliability of the constructs. A high value in these reliability measures suggests that the items used to measure each variable are well correlated, indicating the measurement instrument's reliability. Average Variance Extracted (AVE) coefficients were all greater than 50%, which implies that the constructs explain more than half of the variance of their indicators. This confirms the convergent validity of the model, indicating that the indicators for each construct share a high proportion of variance.

Table 4: Construct Reliability and Validity

Validity and reliability	AMD	CBSMI	LEV	ROA	SIZEFRME	SUD 1	SUD 2	SUD 3
Collinearity	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
C.A								
rho_A								
C.R								
AVE								

As indicated in Table 5, the correlation coefficient between the first and second independent variables (dimensions) was found to be -0.063, a weak negative value. This result suggests there is no significant multi collinearity between the two independent dimensions, meaning their effects on the dependent variable AP can be considered independently. The correlation coefficients between the dimensions of the mediating variables (ESE: Economic, Social, and Environmental dimensions of SD) were also weak and negative, with values of -0.242, -0.400, and -0.003. These weak negative values confirm that there is no problem of multi collinearity between the mediating variables. Therefore, the mediating variables do not interfere with each other in explaining the relationship between the independent variables and AP. The coefficients between most dimensions were significant at the 1% and 5% levels, indicating statistically significant relationships between some of the variables. These results reinforce the reliability and validity of the model's constructs, as reported in Table 5. The absence of collinearity between the independent and mediating variables, confirmed by both the collinearity test and the correlation results, ensures the model's robustness. The strong validity and dependability of the constructions are confirmed by the Cronbach's Alpha, rho_A, Composite Reliability, and AVE findings, thereby guaranteeing a good foundation for the analysis of the link between artificial intelligence adoption, SD, and AP in the banking industry.

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Table 5: Matrix of Correlation.

R (R)			1	2	3	4	5	6	7	8	9
ROA	1	R	1	1	1	1	1	1	1	1	1
		Sig.									
ATMs	2	R	-0.001								
		Sig.	0.985								
POS	3	R	0.073	-0.063							
		Sig.	0.346	0.415							
SUD1	4	R	-.249**	-0.052	-.242**						
		Sig.	0.001	0.495	0.001						
SUD2	5	R	.195*	-0.036	.263**	-.400**					
		Sig.	0.011	0.644	0.001	0.000					
SUD3	6	R	-0.002	0.044	0.051	-0.125	-0.003				
		Sig.	0.977	0.572	0.508	0.104	0.969				
Size firm	7	R	0.044	0.050	-.189*	.220**	-0.034	-0.107			
		Sig.	0.567	0.514	0.013	0.004	0.657	0.164			
LEV	8	R	0.121	0.092	0.024	-0.034	-0.038	-0.023	0.037		
		Sig.	0.115	0.234	0.758	0.662	0.622	0.766	0.629		
SGR	9	R	-0.012	-0.009	0.087	-0.009	0.103	0.102	-.199**	0.016	
		Sig.	0.875	0.903	0.257	0.907	0.182	0.184	0.009	0.838	
**. R is sig. at the 0.01 level (2-tailed).											
*. R is sig. at the 0.05 level (2-tailed).											

Structural Model for Study

Figure 2 shows the Structural Equation Model (SEM) used in the research to assess the direct and indirect interactions among AI, SD, and AP. Analyzed for its direct influence on AP is the independent variable, artificial intelligence, represented by its dimensions ATMs and POS. Furthermore, acting as a mediating variable, SD with its legal, social, and environmental aspects catches the indirect impacts of artificial intelligence on AP. The model investigates how the acceptance of artificial intelligence technology not only increases operational efficiency but also supports sustainable behaviors, which in turn impact AP. Together with the indirect effects mediated by SD dimensions, the direct impacts of artificial intelligence on AP are evaluated reflecting how AI supports legal compliance, social responsibility, and environmental sustainability. Furthermore, the SEM gauges how directly SD affects AP, thereby guiding the way sustainability practices themselves support performance enhancements. The model's arrows depict these hypothesized relationships, highlighting the influence of AI on SD and AP, and how sustainability efforts enhance the financial and operational outcomes of banks. This SEM provides a comprehensive view of how AI integration, supported by sustainable practices, positively affects banking performance.

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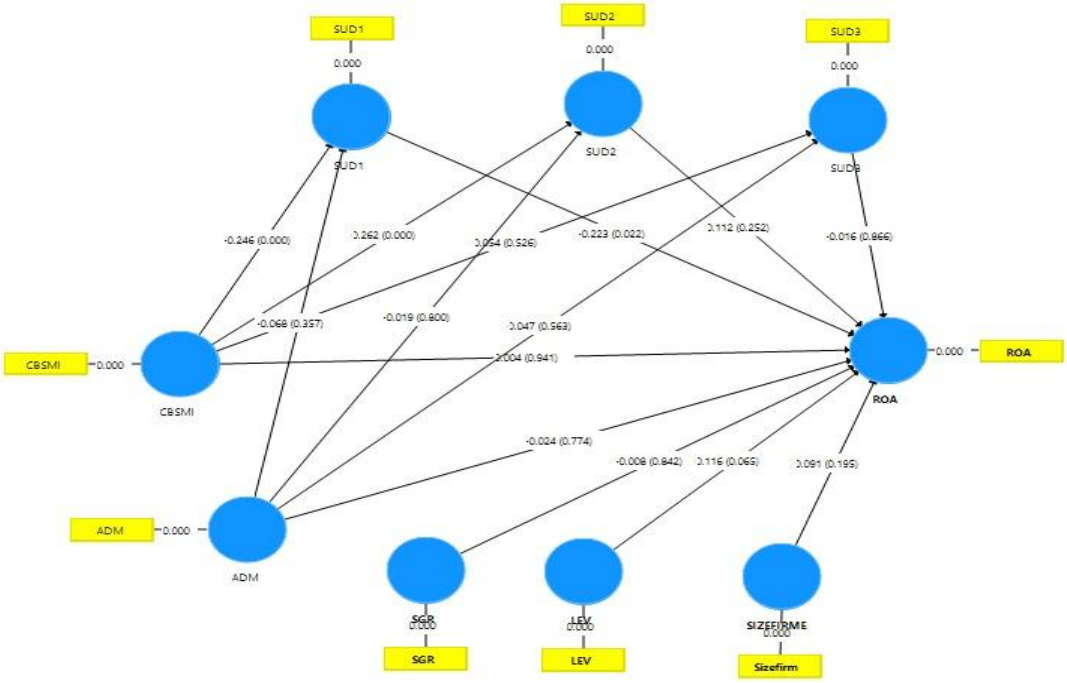

Figure 2: Structural Model of the Study

Measuring the Direct Impact of Artificial Intelligence on Accounting Performance

Table 6 displays the results of the direct impact of AI on AP. The results in Table 6 indicate that there is an indirect effect of AI as an independent variable. Regarding the CBSMI dimension, the results showed a significant effect at a significant level of 0.05 on AP. While the results did not show any effect of the ADM dimension on AP. This test result confirms the test of the study hypothesis (H1) regarding the CBSMI dimension as a proxy for AI.

Table 6: Coefficients of Path

Specific Indirect Effects	Original Sample (O)	T Statistics	P Values
ADM -> ROA	0.012	0.493	0.622
CBSMI -> ROA	0.083	2.894	0.004

Measuring the Direct and Indirect Impact of Artificial Intelligence and Sustainable Development on Accounting Performance

Table 7 presents the results concerning the direct and indirect effects of AI and SD on AP. The findings indicate a significant direct impact of AI, specifically through the CBSMI dimension, on both the economic and social dimensions of SD at a significance level of 0.05. However, no effect was observed from the ADM

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dimension on the SD dimensions. In terms of the direct effect of AI on AP, the results indicated a lack of significant impact. Conversely, the economic dimension of SD was shown to have a positive effect on AP, while the social and legal dimensions did not significantly influence AP. Furthermore, the regulatory variables did not demonstrate any relationship affecting AP. The hypothesis testing for (H2) revealed no significant relationship between the social and legal dimensions of SD and AP. These data confirmed hypothesis (H3) that CBSMI of AI greatly affects SD's economic and social characteristics. Last, hypothesis (H4) tested whether the economic component of SD mediates the relationship between CBSMI (a surrogate for artificial intelligence) and its indirect influence on AP. The findings showed that the economic component of SD mediates this relationship, emphasizing the necessity for sustainable approaches to improve bank performance in the context of AI deployment.

Table 7: Path Coefficients

Direct Effects	Original Sample (O)	T Statistics	P Values
ADM -> ROA	-0.011	0.152	0.880
ADM -> SUD1	-0.068	0.953	0.341
ADM -> SUD2	-0.019	0.253	0.800
ADM -> SUD3	0.047	0.577	0.564
CBSMI -> ROA	0.087	1.626	0.105
CBSMI -> SUD1	-0.246	3.602	0.000
CBSMI -> SUD2	0.262	4.028	0.000
CBSMI -> SUD3	0.054	0.673	0.501
LEV -> ROA	0.116	1.872	0.062
SGR -> ROA	-0.008	0.196	0.845
SIZEFIRME -> ROA	0.091	1.171	0.242
SUD1 -> ROA	-0.223	2.306	0.022
SUD2 -> ROA	0.112	1.163	0.245
SUD3 -> ROA	-0.016	0.171	0.864

DISCUSSION OF RESULTS

In this section, we examine the current work's findings and how well they align with the corpus of existing knowledge. Our results largely corroborate those of López et al. (2007), especially in relation to the relationship between the social and legal components of SD and AP. This suggests that the constant relationship between SD and AP across several contexts may be influenced by a country's unique economic, political, social, and legal environment. These findings may encourage deeper research into this connection and maybe uncover more SD traits affecting the interaction with AP. Our findings align with a number of studies on the relationship between AI and SD (Di Vaio et al., 2020; Hannan et al., 2021; Mhlanga, 2022; Musleh Al-Sartawi et al., 2022; Vinuesa et al., 2020). We also concur with (Berdiyeva et al., 2021; Hashem & Alqatamin, 2021; Odoh et al., 2018; Wamba-

Taguimdje et al., 2020), which demonstrate that companies use AI-provided talents to improve AP. This demonstrates how well AI might contribute to achieving the SDGs and enhancing AP. In particular, by highlighting the mediating role of SD in the relationship between AP and AI, our study contributes to the body of existing knowledge.

CONCLUSION

The study aimed to measure the impact of AI, specifically through ATMs POS systems, on AP, while considering the mediating role of SD (economic, social, and environmental dimensions). The model developed in this study was grounded in three key statistical relationships. The first examined the direct effect of AI on AP, the second investigated the relationship between SD and AP, and the third assessed the mediating role of SD in the connection between AI and SD. The findings indicate a positive relationship between AI and AP, underscoring the importance of SD as a mediator that enhances AP alongside AI. Although the impact was found to be partial, it supports the study's hypotheses. This research contributes significantly to understanding the interplay between these variables, relying on data extracted from the financial statements of Iraqi banks, marking it as a pioneering effort in this context. However, the study is not without its limitations, particularly the challenge of obtaining transparent data from banks, which may affect the robustness of the findings. Based on the insights gained, we recommend further research on AI, particularly studies that document the relationship between AI and information systems governance according to the COBIT framework. Additionally, we encourage exploring other dimensions of SD, such as technological, legal, and governance aspects, to deepen our understanding of their impact on achieving the SDGs.

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