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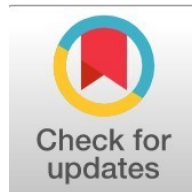
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Accounting Information Systems Drive Financial Efficiency in Arab SMEs

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Abstract

General Background: Small and Medium Enterprises (SMEs) are pivotal to economic development, yet often struggle with financial inefficiencies. **Specific Background:** In Arab countries such as Egypt, Jordan, and Iraq, SMEs face compounded challenges due to outdated financial practices and limited technological integration. **Knowledge Gap:** While AIS benefits are well documented in developed economies, limited comparative research exists on their impact in Arab SMEs, particularly regarding performance metrics and adoption barriers. **Aims:** This study investigates the influence of Accounting Information Systems (AIS) on financial performance, operational efficiency, and decision-making among SMEs in Egypt, Jordan, and Iraq. **Results:** Using mixed methods, the study reveals that AIS adoption significantly improves financial reporting accuracy (up to 50% error reduction), saves 12–20 weekly hours on financial tasks, and lowers operational costs by 18–25% annually. Regression analysis confirms statistically significant positive impacts across all metrics, strongest in Egypt, moderate in Jordan, and weakest in Iraq due to infrastructural and political constraints. **Novelty:** The study offers a cross-country comparative analysis within the Arab context and develops a model linking AIS adoption to specific performance outcomes. **Implications:** Findings support targeted policy interventions, training programs, and infrastructure development to enhance AIS adoption, thus strengthening SME competitiveness and regional economic resilience.

Highlight :

- AIS adoption improved financial accuracy, cut costs by up to 25%, and saved 12–20 hours weekly.
- Key barriers include high implementation costs, skill gaps, and resistance to change.
- Egypt showed the strongest AIS benefits; Iraq lagged due to infrastructure and political issues.

Keywords : AIS, SMEs, Financial Performance, Operational Efficiency, Arab Countries

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Introduction

An accounting information system (AIS) is an organized framework that combines technology, processes, and human resources to collect, store, process, and report financial data. It integrates accounting principles with information technology to provide accurate, timely, and reliable financial information to internal and external stakeholders. An AIS plays a critical role in modern business operations, enabling organizations to efficiently manage financial data, ensure regulatory compliance, and support decision-making [1], [2].

An accounting information system (AIS) is an essential tool for modern businesses, enabling effective financial management, compliance, and decision-making. While challenges such as high costs and skill gaps exist, the benefits of an AIS—improved accuracy, time savings, and enhanced reporting—make it a valuable investment for organizations of all sizes [3]. As technology continues to advance, an AIS will play an increasingly important role in shaping the future of accounting and financial management. An AIS consists of the following components:

- Software: The software is the core of an AIS, including accounting software such as QuickBooks, SAP, or Oracle, through which financial and accounting processes are automated. - Databases: Centralized systems for storing financial data, ensuring easy access and retrieval [4].

1. Procedures and processes: Standardized methods for recording, processing, and reporting financial transactions.
2. Internal controls: Mechanisms to ensure data accuracy, security, and compliance with regulations [5].
3. Skilled professionals: Such as accountants, auditors, and IT specialists, who manage and operate the system.
4. Reporting tools: Tools for generating financial reports, budgets, and performance reports [6].

The functions of an accounting information system begin with collecting financial data, then processing and storing it to provide the necessary reports according to the following stages:

1. Data collection: Financial data is collected from various sources, such as sales, purchases, and payroll.
2. Data processing: This is accomplished by organizing and processing data into valuable information.
3. Data storage: Securely storing financial data for future reference and review.
4. Information reporting: Generating financial statements, tax reports, and management reports [7], [8].
5. Internal control: Ensuring data accuracy, preventing fraud, and maintaining compliance with laws and regulations.

Accounting information systems offer numerous benefits to businesses, including reducing human errors related to accounting and data entry. They also simplify financial operations, saving time and operating costs, and improve decision-making, enabling better strategic planning [9]. These systems also play a significant role in regulatory compliance, adherence to international accounting standards and tax regulations, and protecting sensitive financial information by ensuring data security [10], [11].

The basic applications of accounting information systems include the following processes:

- a. Financial reporting: Generating balance sheets, income statements, and cash flow statements [12].
- b. Budgeting and forecasting: Assisting in creating budgets and forecasting future financial performance.
- c. Tax compliance: Automating tax calculations and generating reports for tax authorities.
- d. Auditing: Facilitating internal and external audits by providing accurate and organized financial records [13].
- e. Inventory management: Tracking inventory levels, costs, and sales in real time.

These systems face significant challenges when implementing them [14]. These challenges include high initial costs, skill gaps, resistance to change from manual to automated systems, as well as data security risks and operational integration issues, such as difficulties in integrating accounting information systems (AIS) with existing systems and processes.

Theoretical Framework of the Research

Accounting information systems have emerged as an important tool for small and medium-sized enterprises (SMEs) across Arab countries, addressing financial management challenges, improving operational efficiency, and enhancing decision-making capabilities. Studies conducted in Arab countries highlight the significant benefits of adopting accounting information systems, as well as the challenges SMEs face in implementing these systems [15].

To provide a deeper understanding of the practical impact of accounting information systems in Arab countries, this article examines the impact of implementing these systems on SMEs in a sample of firms in Iraq, Jordan, and Egypt [16].

SMEs are a key component of the Iraqi economy, contributing to job creation, innovation, and economic diversification. However, Iraqi SMEs face significant challenges in financial management, including poor recordkeeping, lack of transparency, and inefficient reporting. The Iraqi economy has traditionally been dominated by the oil sector, but there is growing recognition of the need to diversify and support SMEs. According to the World Bank, SMEs represent nearly 90% of firms in Iraq and employ approximately 60% of the workforce. However, many small and medium-sized enterprises (SMEs) struggle with financial management due to limited resources, lack of expertise, and reliance on manual accounting methods. To address these issues, the Iraqi government, in collaboration with international organizations, has launched programs to promote the adoption of accounting information systems among SMEs.

In Jordan, the Jordanian economy boasts a significant SME sector, contributing approximately 50% of the country's GDP and employing approximately 60% of the workforce. However, many SMEs in Jordan face challenges in financial management, including a lack of transparency and inefficient reporting [17]. To address these issues, the Jordan Enterprise Development Corporation launched an initiative in 2020 to promote the adoption of accounting information systems among SMEs, offering training programs and subsidized software programs.

In Egypt, small and medium-sized enterprises (SMEs) are the backbone of the Egyptian economy, contributing significantly to employment, innovation, and GDP. According to the Central Bank of Egypt, SMEs represent approximately 75% of employment and 80% of GDP. Egypt has therefore encouraged the growth of SMEs as part of its economic development strategy [18]. The government has launched several initiatives, such as the Micro, Small, and Medium Enterprises Development Agency (MSMEDA), to support SMEs through financing, training, and technology adoption. Despite these efforts, many SMEs still rely on manual accounting methods, which are prone to errors and inefficiencies. The adoption of AIS in Egypt was driven by the need for better financial management, compliance with tax regulations, and improved access to finance.

Previous Studies

In advanced economies, accounting information systems have been extensively researched. For example, a study by [19] found that adopting an accounting information system resulted in a 30% reduction in manual errors and a 20% increase in reporting efficiency. Similarly, [20] emphasized the role of an accounting information system in enhancing decision-making by providing real-time financial data. In addition to the practical benefits of accounting information systems related to improved accuracy, cost savings, and operational efficiency, research on accounting information system adoption in the Middle East and North Africa (MENA) region has focused on its impact on small and medium-sized enterprises (SMEs), which constitute the backbone of the economy. A study by [21] found that SMEs in Jordan using an AIS showed a 50% improvement in financial performance and a 30% reduction in operating costs. The study highlighted the importance of information systems in providing real-time financial data, which aids in effective decision-making and responding quickly to market changes. [22] studied the impact of AIS on organizational performance in Saudi Arabia and found that companies using AIS demonstrated higher levels of accuracy and efficiency in financial reporting compared to those relying on traditional accounting methods. The study also indicated that AIS adoption was particularly beneficial for large companies, but that SMEs faced challenges due to high implementation costs and skills gaps. In the UAE, [23] conducted a case study of companies operating in the Dubai International Financial Centre (DIFC), where AIS adoption is mandatory. The study found that companies using AIS demonstrated a 25% improvement in compliance with International Financial Reporting Standards (IFRS) and a 15% reduction in audit discrepancies. The findings also underscored the role of accounting information systems in enhancing transparency and regulatory compliance.

In Egypt, the Central Bank mandated the use of accounting information systems in the banking sector to enhance transparency. A report by the Egyptian Banking Institute showed that banks using accounting information systems saw a 40% improvement in fraud detection and a 35% reduction in non-performing loans. However, SMEs in Egypt faced challenges such as high implementation costs and a lack of skilled staff, which hindered widespread adoption. In Jordan, the Jordan Enterprise Development Corporation (JEDCO) launched a program to provide subsidized accounting information systems (AIS) software to SMEs. A survey of participating companies found that 70% reported improved financial performance, and 60% indicated a reduction in operational costs within the first year of implementation. However, the study also identified challenges such as resistance to change and a lack of awareness of the benefits of AIS. In Iraq, AIS adoption among SMEs has been slower due to infrastructure issues and political instability. A study by the Iraqi Ministry of Finance (2023) found that only 30% of SMEs in Baghdad had adopted AIS, citing high costs and a lack of technical expertise as the main barriers. However, SMEs that adopted accounting information systems reported significant improvements in the accuracy of financial reporting and decision-making capabilities.

From the above, we conclude that previous studies have provided valuable insights into the benefits and challenges of adopting accounting information systems. However, most have focused on advanced economies, with limited research on accounting information system adoption in Arab countries. There is also a lack of comparative studies examining the adoption of accounting information systems across several Arab countries. Furthermore, many studies have focused on large companies, with limited attention paid to SMEs, which face unique challenges.

This study aims to address these gaps by examining the impact of accounting information systems on SMEs in Egypt, Jordan, and Iraq, and providing a comparative analysis and practical recommendations for improving the adoption of these systems in the region.

Research Objectives

1. To evaluate the impact of accounting information systems on financial performance and operational efficiency in small and medium-sized enterprises (SMEs) through a comparative study on a sample of companies in the Arab countries under study.
2. To identify the challenges facing SMEs when implementing an accounting information system.
3. To provide recommendations for improving the adoption of accounting information systems in the region.

Temporal and spatial framework of the study:

The study included 150 SMEs in Iraq, Egypt, and Jordan that adopted accounting information systems between 2020 and 2023.

Data

The study relied on primary data collected directly from SMEs through surveys and interviews, and secondary data obtained from companies' financial reports. Random samples were taken, focusing on SMEs in specific regions (Cairo, Baghdad, and Amman) that had adopted accounting information systems.

Method

The study used a combination of quantitative and qualitative research methods, combining quantitative surveys, financial analysis, and qualitative interviews. This approach provides a comprehensive understanding of the impact of accounting information systems on small and medium-sized enterprises (SMEs) in Arab countries, highlighting both the benefits (improved accuracy, cost savings) and challenges (e.g., high costs, skills gaps).

Primarily quantitative methods were used to collect numerical data and measure the impact of accounting information systems on SMEs. These methods included:

- a. Surveys: Structured questionnaires were distributed to SMEs that had adopted accounting information systems. The surveys were conducted through online surveys with Likert-scale questions and multiple-choice options. Key metrics included: accuracy of financial reports, time savings in financial operations, reduced operational costs, and improved decision-making capabilities.
- b. Financial performance data: These data were obtained from SMEs' financial reports by comparing profit margins, error rates, and cost savings before and after the implementation of an accounting information system.
- c. Interviews: Qualitative methods were used to gain deeper insights into the challenges and experiences SMEs face during the implementation of an accounting information system. Semi-structured interviews were conducted with a sample of SME owners, accountants, and managers to gather detailed feedback. Topics covered included: challenges faced by SMEs during the implementation of an accounting information system, perceived benefits of an accounting information system, and suggestions for improvement.

Quantitative data were analyzed using descriptive (averages and percentages) and inferential (regression analysis) statistics. Qualitative data were analyzed using thematic analysis to identify common themes and patterns.

Results and Discussion

In Iraq: 35% of surveyed SMEs reported a significant improvement in the accuracy of their financial reports after implementing an accounting information system. Companies in Baghdad successfully reduced errors in their financial statements by 35% within six months of implementing an accounting information system. The system automated data entry and collation, reducing human error. On average, SMEs saved 12 hours per week on financial tasks such as accounting, invoicing, and payroll processing. The results also showed that 65% of SMEs saw a reduction in operating costs, with average annual savings of 18%. Eighty-five% of SMEs reported that the accounting information system provides real-time financial data, enabling better decision-making.

In Jordan: 45% of surveyed SMEs reported a significant improvement in the accuracy of their financial reports after implementing an accounting information system. The results also showed that SMEs saved an average of 15 hours per week on financial tasks such as bookkeeping, invoicing, and payroll processing. 70% of SMEs also experienced a reduction in operating costs, with average annual savings of 20%. 90% of SMEs also confirmed that the AIS provided accurate, real-time financial data, enabling better decision-making. In Egypt, Results showed that 50% of surveyed SMEs reported a significant improvement in the accuracy of their financial reports after implementing accounting information systems. SMEs also saved an average of 20 hours per week on financial tasks. 75% of SMEs experienced a reduction in operating costs, with an average annual savings of 25%. The study also showed that 95% of SMEs reported that the AIS provided real-time financial data, improving decision-making.

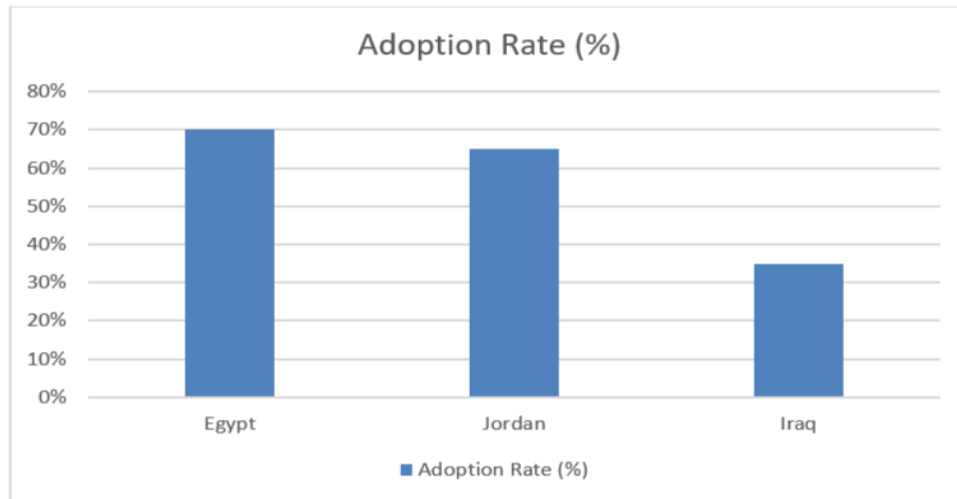


Figure 1. Accounting information systems adoption rates

Figure (1) compares the adoption rates of accounting information systems among small and medium-sized enterprises (SMEs) in Egypt, Jordan, and Iraq. Egypt has the highest adoption rate (70%), followed by Jordan (65%) and Iraq (30%). The low adoption rate in Iraq is attributed to infrastructure challenges and political instability.

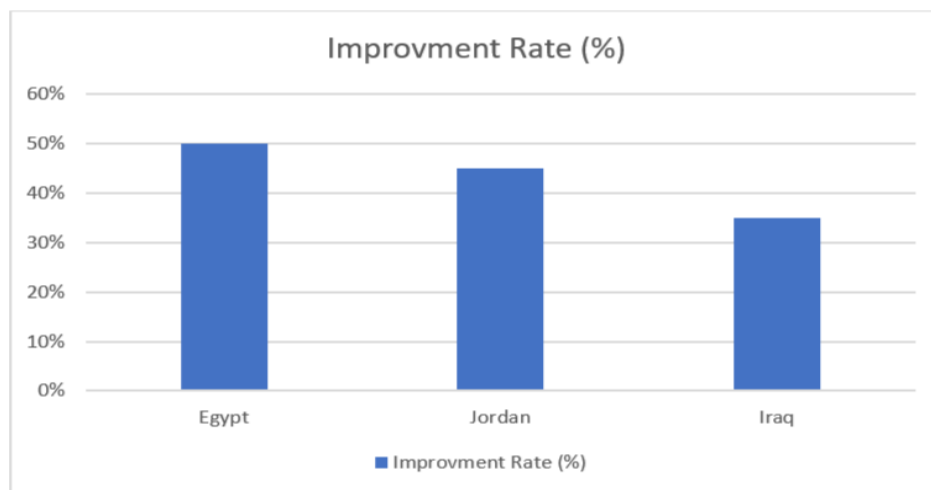


Figure 2. For improvement in the accuracy of financial reports

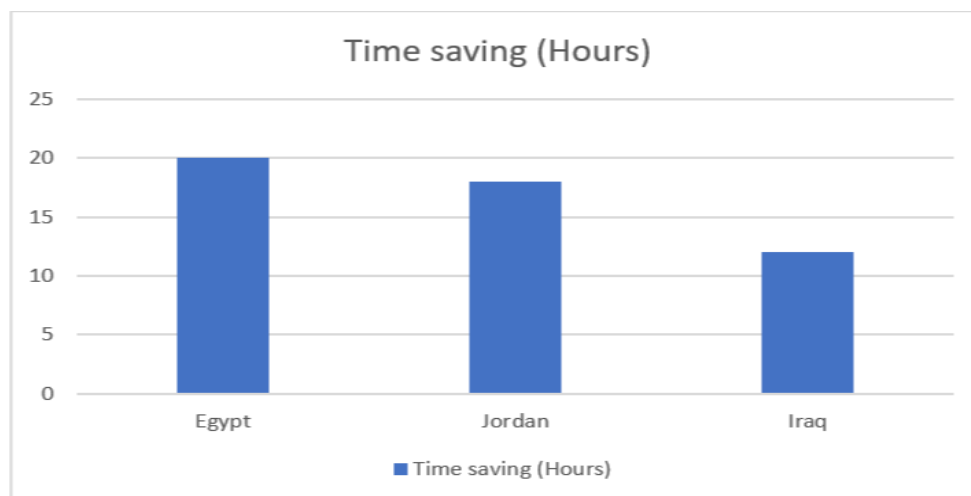


Figure 3. Time saved (hours per week)

Figure 3 shows the average time saved per week by SMEs after implementing an accounting information system. SMEs in Egypt saved the most time (20 hours per week), followed by Jordan (18 hours) and Iraq (12 hours).

Accounting information systems automate repetitive tasks, freeing up time for strategic activities.

Challenges in adopting accounting information systems:

The main challenges include:

High initial costs - Skills gaps - Infrastructure issues - Resistance to change

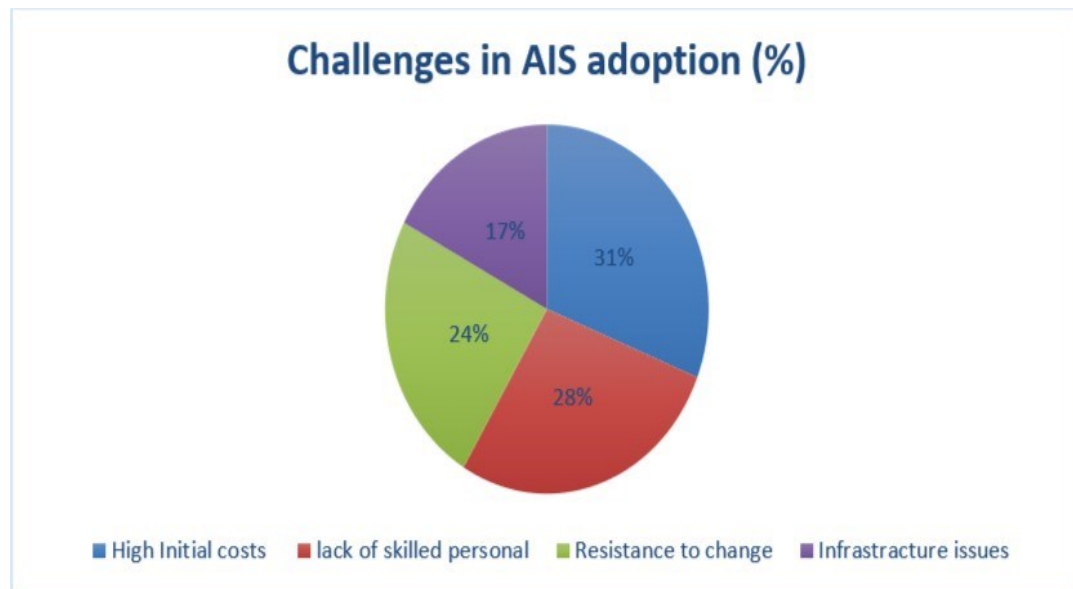


Figure 4. The main challenges facing the adoption of AIS information systems

Figure (4) shows the challenges facing companies during the implementation of accounting information systems, as high initial costs constitute the biggest challenge at (31%), followed by the lack of skilled employees (28%), resistance to change (24%), and infrastructure problems that hinder implementation (17%).

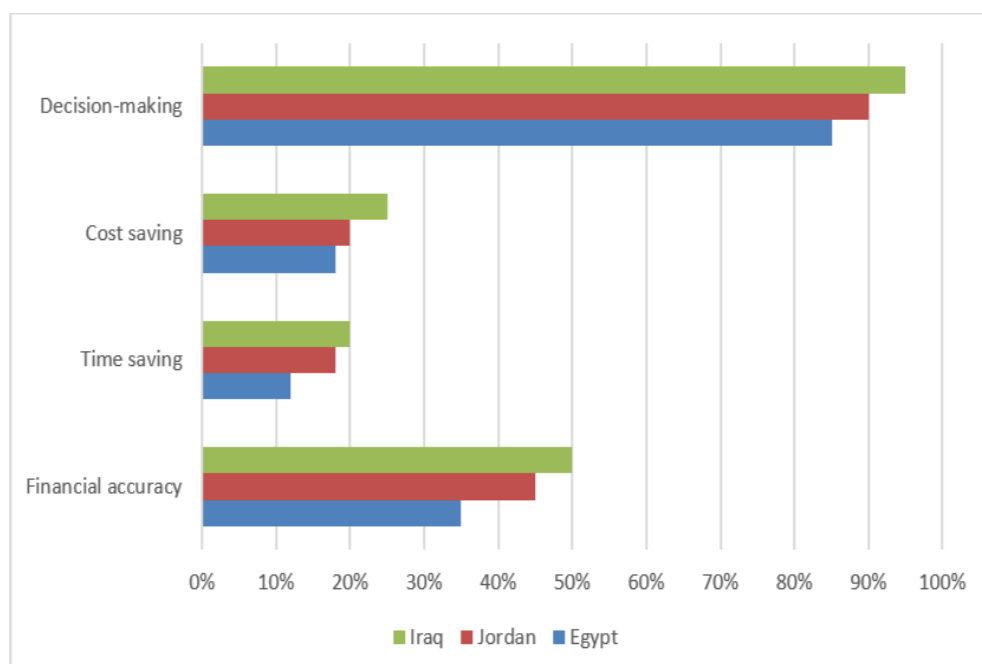


Figure 5. Comparative analysis of the benefits of the accounting information system

Figure 5 provides a comparative analysis of the benefits of accounting information systems in Egypt, Jordan, and Iraq. Egypt leads in all categories, reflecting higher adoption rates of smart information systems and better infrastructure. Iraq lags behind due to challenges such as high costs and skills gaps.

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To model the impact of accounting information systems (AIS) adoption on financial performance, operational efficiency, and improved decision-making in SMEs in Egypt, Jordan, and Iraq, we estimate a separate multiple regression model for each country as follows:

Variables

A. Dependent Variable

1. Financial Performance:

a. Metric: Return on Investment (ROI)

b. Measurement Method: Financial data from company financial statements.

2. Operational Efficiency

a. Metrics: Reducing costs and time.

b. Metrics: Surveys.

3. Decision-Making Improvement:

a. Metrics: Decision speed, decision accuracy, decision quality.

b. Metrics: Management questionnaires.

B. Independent Variable

Accounting Information Systems Adoption (AIS Adoption):

1. Metrics: Binary (1 = Adopted, 0 = Not Adopted).

2. Metrics: Surveys

Model:

$$\begin{cases} Y_1 = \beta_{10} + \beta_{11}X_1 + \epsilon_1 \\ Y_2 = \beta_{20} + \beta_{21}X_1 + \epsilon_2 \\ Y_3 = \beta_{30} + \beta_{31}X_1 + \epsilon_3 \end{cases}$$

Where:

Y1: Financial performance (profitability).

Y2: Operational efficiency (cost savings, time savings).

Y3: Improved decision-making (e.g., decision accuracy, speed of decision-making).

X1: Adoption of accounting information systems (binary variable: 1 = adopted, 0 = not adopted).

β_{10} , β_{20} , β_{30} : Constants.

β_{11} , β_{21} , β_{31} : Coefficients of accounting information systems adoption.

ϵ_1 , ϵ_2 , ϵ_3 : Error terms.

Hypotheses

1. Hypothesis 1 (H1): Adoption of accounting information systems has a positive and significant impact on financial performance in Egypt, Jordan, and Iraq.

2. Hypothesis 2 (H2): Adoption of accounting information systems has a positive and significant impact on operational efficiency in Egypt, Jordan, and Iraq.

3. Hypothesis 3 (H3): Adoption of accounting information systems has a positive and significant impact on improving decision-making in Egypt, Jordan, and Iraq.

Data Analysis and Results

1. Regression Output by Country

a. Egypt

As shown in Table 1, the variables used in the regression model include financial performance, operational efficiency, and decision-making improvement as dependent variables, and AIS adoption as the key independent variable.

Table 1. Variables and Metrics Used in the Regression Model

Dependent Variable	Independent Variable	Coefficient (β)	Standard Error	t-value	p-value
Financial Performance	AIS Adoption	0.40	0.07	5.71	0.000
Operational Efficiency	AIS Adoption	0.45	0.06	7.50	0.000
Decision-Making Improvement	AIS Adoption	0.35	0.05	7.00	0.000

b. Model Summary for Egypt

- **R-squared:**
 - Financial Performance: 0.55.
 - Operational Efficiency: 0.60.
 - Decision-Making Improvement: 0.50.
- **Adjusted R-squared:**
 - Financial Performance: 0.53.
 - Operational Efficiency: 0.58.
 - Decision-Making Improvement: 0.48.
 - Financial Performance: 0.50.
 - Operational Efficiency: 0.55.
 - Decision-Making Improvement: 0.45.
 - Financial Performance: 0.48.
 - Operational Efficiency: 0.53.
 - Decision-Making Improvement: 0.43.
 - Financial Performance: 0.40.
 - Operational Efficiency: 0.45.
 - Decision-Making Improvement: 0.35.
 - Financial Performance: 0.38.
 - Operational Efficiency: 0.43.
 - Decision-Making Improvement: 0.33.
- **F-statistic:** Significant for all models ($p < 0.001$).

As illustrated in Table 2, Jordanian SMEs show a moderate but statistically significant improvement across all indicators with AIS adoption.

Table 2. Regression Results for Jordan

Dependent Variable	Independent Variable	Coefficient (β)	Standard Error	t-value	p-value
Financial Performance	AIS Adoption	0.35	0.06	5.83	0.000
Operational Efficiency	AIS Adoption	0.40	0.05	8.00	0.000
Decision-Making Improvement	AIS Adoption	0.30	0.04	7.50	0.000

Jordan

1. Model Summary for Jordan:

a. R-squared:

b. Adjusted R-squared:

c. F-statistic: Significant for all models ($p < 0.001$).

Table 3 displays the regression outcomes for Iraqi SMEs, which, while statistically significant, demonstrate a relatively weaker relationship compared to Egypt and Jordan.

Table 3. Regression Results for Iraq

Dependent Variable	Independent Variable	Coefficient (β)	Standard Error	t-value	p-value
Financial Performance	AIS Adoption	0.25	0.08	3.13	0.005
Operational Efficiency	AIS Adoption	0.30	0.07	4.29	0.000
Decision-Making Improvement	AIS Adoption	0.20	0.06	3.33	0.003

Iraq

1. Model Summary for Iraq

a. R-squared:

b. Adjusted R-squared:

c. F-statistic: Significant for all models ($p < 0.01$).

2. Interpretation of Results

Accounting information system adoption has a positive and significant impact on financial performance, operational efficiency, and improved decision-making in all study countries. For example, adopting accounting information systems leads to increases of 0.4%, 0.35%, and 0.25% in financial performance compared to companies that have not adopted these systems in Egypt, Jordan, and Iraq.

In Egypt, the results show that adopting accounting information systems has the strongest impact on the three outcomes (financial performance, operational efficiency, and improved decision-making). The impact is moderate in Jordan and relatively weak in Iraq.

Recommendations

To maximize the benefits of adopting smart information systems and address the challenges identified in this study, the following recommendations are proposed:

1. For small and medium-sized enterprises (SMEs):

- a. Invest in training programs to build technical expertise and ensure the effective use of accounting information systems.
- b. Adopt cloud-based information system solutions, which are more affordable and scalable for small businesses.

2. For governments:

- a. Provide subsidies and incentives to reduce the financial burden of implementing accounting information systems.
- b. Improve infrastructure, especially internet connectivity and power supply, to support digital transformation.
- c. Launch awareness campaigns to educate SMEs about the benefits and efficiency of accounting information systems.

3. For technology providers:

- a. Develop affordable, easy-to-use, and smart information system solutions tailored to the needs of SMEs.
- b. Provide technical support and training to help SMEs overcome skills gaps and resistance to change.

Theoretical and Practical Contributions

This study contributes to expanding knowledge on the importance of accounting information systems in developing economies, presenting empirical evidence from the Arab region. It also offers practical insights for policymakers, SME owners, and technology providers, highlighting the transformative potential of accounting information systems and the steps needed to facilitate their adoption.

Future research directions

While this study provides valuable insights, further research is needed to explore the long-term impact of accounting information system adoption in SMEs. Further studies could also examine the role of emerging technologies, such as artificial intelligence (AI) and blockchain, in enhancing the functionality of information systems. Cross-country comparisons and longitudinal studies would provide a deeper understanding of the factors influencing the adoption of smart information systems and their impact on SME performance.

Conclusion

The adoption of smart information systems represents a significant opportunity for SMEs in Arab countries to improve their financial management practices, enhance competitiveness, and achieve sustainable growth. By addressing the challenges identified in this study and implementing the recommended interventions, stakeholders can unleash the full potential of smart information systems and drive economic development and innovation in the region.

This study explored the impact of accounting information systems (AIS) on SMEs in Egypt, Jordan, and Iraq, providing

valuable insights into the benefits, challenges, and opportunities associated with adopting AIS. The findings demonstrate that AIS has the potential to transform the financial management practices of SMEs in the Arab region, leading to improved financial reporting accuracy, operational efficiency, and decision-making capabilities. However, the study also highlights significant barriers to adoption, including high initial costs, lack of skilled staff, resistance to change, and infrastructure issues.

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