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IMPACT OF EXPERT SYSTEMS ON IMPROVING ACCOUNTING INFORMATION SYSTEM QUALITY

Wafa Ahmouda
Laboratory of Innovation, Economic and Financial Analysis, Badji Mokhtar - Annaba University, Algeria
ORCID: https://orcid.org/0009-0004-8592-3388

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Abstract

This study aims to investigate the impact of expert systems on improving the quality of accounting information systems (AIS) in Algeria. Digitalization and automation have become firmly established practices across financial and administrative domains. Among these advancements, intelligent accounting systems play a decisive role in improving data quality and enhancing the precision of financial reporting. These improvements directly support more informed and reliable managerial decisions. A quantitative explanatory research design was used to investigate whether the adoption of expert systems has an impact on the four dimensions of AIS quality: accuracy and reliability of accounting data, timeliness of financial information, relevance and completeness, and efficiency and ease of system use. Questionnaire data were gathered through email to 150 accounting professionals (73 usable responses). The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The study's results demonstrated that expert systems have a positive impact on all dimensions of AIS quality. The strongest relationships were observed with the accuracy and reliability of data, followed by timeliness, relevance, and efficiency. The findings demonstrate the strategic importance of expert systems in improving the performance of accounting information systems (AIS). They also provide actionable insights for accounting professionals and institutions seeking to advance their digital competencies. The study makes a valuable contribution to the literature by addressing a geographic gap and presenting evidence from a developing country context.

Keywords: *Accounting information system, Expert systems, Data quality, System efficiency, Artificial Intelligence.*

Address of the corresponding author:
Wafa Ahmouda
wafa.ahmouda@univ-annaba.dz

1 INTRODUCTION

The ongoing digital transformation in accounting has accelerated the adoption of intelligent technologies to enhance the efficiency, accuracy, and reliability of financial reporting. Among these technologies, expert systems, defined as AI-

based programs that replicate human expert reasoning through rule-based logic and knowledge bases, have become particularly relevant in the context of accounting information systems AIS (Ahmad & Zawaideh, 2014). Integrating these systems into AIS enables automated execution of complex decision-making tasks, minimizes human error, and strengthens data validation and internal control mechanisms (Zayed, Nour, Al Attar, Almubaideen, & Abdelaziz, 2024; Johri, 2025).

Globally, numerous studies have demonstrated that expert systems support real-time analysis, fraud detection, and strategic decision-making by enhancing the quality and relevance of accounting outputs (Al Astal, Nomran, & Milhem, 2025; Alramahi, Alzagaybeh, Almubaydeen, & Binsaddig, 2024). However, most of these studies have been concentrated on developed economies, where advanced infrastructure and digital readiness facilitate widespread Artificial Intelligence (AI) deployment. In contrast, there is little empirical evidence regarding the use and impact of expert systems within developing countries, particularly in North Africa.

In Algeria, despite growing interest in digital innovation, the integration of expert systems into AIS remains in its early stages. Organizations face several challenges when adopting expert systems. These include limited understanding of their applications, insufficient technical expertise, and inadequate financial resources. Such obstacles have hindered the integration of AI-based solutions in the accounting profession, and although there is a research gap in knowledge regarding the effect of expert systems on AIS quality in the local context. To fill this gap, this research aims to examine the influence of expert systems on AIS quality. It is grounded in the perceptions of accounting professionals in Algeria. It revolves around four main quality dimensions: accuracy and reliability of accounting data, timeliness of financial information, relevance and completeness of information, and efficiency and ease of system use. By integrating empirical findings with locally sourced data, this research contributes to the growing body of literature on the implementation of expert systems within accounting information systems.

It also offers practical implications for Algerian companies and regulatory bodies aiming to modernize their accounting frameworks through AI-based tools.

In the Algerian context, and based on the previous literature, the study aimed to answer the following research question.

RQ: What is the impact of expert systems on the quality of accounting information systems, as perceived by Algerian accounting professionals?

To explore this question, data were collected by a structured questionnaire sent to members of the accounting profession in Algeria. Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed to analyze the measurement components and structural relationships within the proposed model.

The structure of the paper is as follows: the second section presents the theoretical framework and literature review; the third section outlines the research method; the fourth section presents the results, which are discussed in Section five; and finally, Section six concludes the study, summarizing key insights and implications.

2 THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1 Application of Expert Systems in Accounting

Expert systems represent a category of AI applications fashioned to emulate human expert decision-making by utilizing logical rules of a formal knowledge structure (Ahmad & Zawaideh, 2014). These systems have the capabilities to model rule-based inference, fuzzy logic, adaptive learning, and mimic intelligent analysis. They can simulate the professional decision-making process in various areas, such as accounting. Within the domain of AIS, expert systems are implemented to support complex decision-making processes, including audit planning, fraud detection, earnings management assessments, and real-time financial reporting.

These systems are designed to manage the increasing volume and complexity of financial data and decision variables.

Emerging research highlights the pivotal role of expert systems in strengthening the automation, accuracy, and cognitive functionality of AIS infrastructures. Ahmad and Zawaideh (2014) also observed that the application of expert systems based on fuzzy systems had simplified the AIS after they removed the classical mathematical programming interface and replaced it with the linguistically built modules. The simplified and user-friendly design enhanced the overall user experience.

It also reduced training time and minimized the need for IT staff involvement.

These improvements collectively surpassed the expectations of the financial departments of large enterprises regarding AIS availability and functionality.

Additional empirical evidence demonstrates that the application of expert systems within AIS contributes to greater operational effectiveness and supports improved decision-making. Al Astal et al. (2025) reported on a study of organizations in the Kingdom of Bahrain, claiming they developed an AIS by integrating expert systems into their infrastructure. This integration consequently increased both the efficiency of processing tasks and the accuracy of financial reporting. These environments also focused on automating repetitive tasks and supporting more evidence-based financial decisions. The study recommended implementing training programs to ensure effective use of these systems.

Additionally, the system would not only process data but also perform more sophisticated predictions and anomaly screening. For example, Zayed et al. (2024) examined the role of expert systems in the AIS in enhancing fraud detection in the hospitality industry. The authors inferred that the prediction rule generation model of the developed expert system enhanced its ability to detect financial fraud and prevent its recurrence. In a separate study, Alramahi et al. (2024) found that the implementation of expert systems contributed to the reduction of risks associated with cloud accounting in Jordanian telecommunication firms. The authors proposed that expert systems may strengthen system control and improve risk identification processes.

From a system design perspective, Yan and Ji (2024) highlight the role of expert systems in designing intelligent, adaptive AIS systems. Their theoretical analysis suggests that expert systems enhance the reliability and credibility of AIS by facilitating automation, minimizing human errors, and ensuring the accuracy of accounting information. Properly integrated, these systems help make AIS a more adaptive strategy for financial decision-making.

All these studies demonstrate that expert systems are moving from technical auxiliaries to integral parts of AIS. Their ability to mimic expert judgment, interpret data autonomously, and enhance decision-making precision positions among the principal drivers of innovation in contemporary accounting systems.

2.2 Quality of Accounting Information Systems

The effectiveness of AIS revolves around the quality of the system in supporting financial processes, decision-making, and statutory obligations. Four primary dimensions have been central to the perception of AIS quality:

- accuracy and reliability of accounting data;
- timeliness of financial information;
- relevance and completeness of information;
- efficiency and ease of system use.

2.2.1 Accuracy and Reliability of Accounting Data

Accuracy and reliability are critical dimensions that underpin the quality of AIS, as they ensure that the accounting information accurately reflects financial reality and is free from material misstatements. Recent empirical studies confirm that the new AIS, particularly AIS with embedded intelligent technologies, can greatly enhance data quality. For example, Johri (2025) examines the effects of integrating AI into AIS systems, highlighting improvements in the reliability of financial reports achieved by reducing manual input errors, enhancing data consistency, and optimizing the production process within the financial reporting cycle. Similarly, Al Astal et al. (2025) found that the implementation of automated AIS systems was associated with more accurate financial results and reduced errors, particularly when internal controls and validation

mechanisms were embedded in the system's design.

2.2.2 Timeliness of Financial Information

AIS timeliness refers to the alignment between the issuance and availability of financial data and real-time business conditions. This alignment is considered crucial for enabling informed decision-making. The use of intelligent systems in AIS across its architecture introduced faster information processing as the much-needed solution for timely decision-making and reporting (Quan, 2025). Timing is critical in high-risk industries such as telecommunications, particularly in the detection of anomalies and fraudulent activities. Zayed et al. (2024) highlighted that the timely detection of financial irregularities was made possible through predictive monitoring functions embedded in AIS platforms, reducing reporting delays and enhancing control responsiveness.

2.2.3 Relevance and Completeness of Information

Financial information should be relevant and complete to ensure that reports meet users' informational needs, reflecting the organization's overall financial operations. Johri (2025) claimed that AIS enhanced with intelligent tools generates more comprehensive analytical reports by integrating data from both internal and external sources, thereby enhancing its strategic value. Alramahi et al. (2024) also emphasized that expert systems contribute to the completeness of AIS output by systematically evaluating large datasets, identifying gaps in data entry, and ensuring that critical financial indicators are captured comprehensively.

2.2.4 Efficiency and Ease of System Use

Efficiency and user-friendliness determine how effectively users interact with the AIS. Ahmad and Zawaideh (2014) demonstrated that AISs incorporating fuzzy logic and expert system-guided design significantly reduces overall system complexity.

As a result, even users without accounting backgrounds, particularly non-technical staff—can more easily navigate, analyze, and interact with financial data. Al Astal et al. (2025) reported that systems with lower usability were less frequently adopted and demonstrated reduced operational efficiency, primarily due to limited training duration and minimal user error feedback. Yan and Ji (2024) also indicated that user-friendly AIS developed using AI technologies expedited all processes, reduced the burden of financial reporting, and improved productivity at a broader scale.

2.3 Literature Review and Research Hypotheses Development

The use of expert systems in AIS has received growing attention in recent times to enhance decision quality, reporting quality, and operational efficiency. Expert systems that simulate expert cognitive processes by utilizing rule-oriented logic, fuzzy inference, and information embedded in knowledge bases are useful and structurally sound for automatically solving challenging accounting problems (Ahmad & Zawaideh, 2014). In the context of AIS, such tools promote consistency in evaluative decision-making, facilitate automated data verification, and produce reporting outputs that are both timely and analytically relevant.

Recent research presents empirical evidence demonstrating how expert systems enhance key AIS quality attributes. Automated procedures and internal consistency mechanisms support the generation of high-quality and reliable data. For example, according to Johri (2025), AI-based AIS reduces the likelihood of manual input errors and incorporates system-level financial data validation, thereby enhancing the reliability of reported outcomes. This result is also supported by Al Astal et al. (2025), who found that expert systems enhance data quality and reduce the level of inconsistency across reporting periods in the case of Bahraini firms.

One other advantage of the expert systems embedded in AIS is the timelier reporting of financial information. Quan (2025) demonstrated that automated accounting systems, particularly those integrated with intelligent components, optimize data processing and deliver real-time financial insights. This result is consistent with Zayed et al. (2024), who found that expert system-driven fraud detection functionalities enhanced speed and reduced the time required to address the anomalies, especially in high-risk sectors.

Literature likewise describes the potential impact of expert systems in the context of making AIS information more relevant and complete. These tools can contextualize and synthesize large amounts of data into decision-relevant products. According to Johri (2025), expert systems can generate more meaningful reporting by combining both internal and external data. Similarly, Alramahi et al. (2024) showed that expert systems in cloud-based AIS platforms filled data gaps and ensured the completeness of financial records.

Furthermore, efficiency and system usability are substantially enhanced through the integration of expert systems. Ahmad and Zawaideh (2014) highlighted how expert systems reduced system complexity and improved user accessibility, particularly by providing interfaces that mimic natural reasoning. Yan and Ji (2024) further noted that intelligent AIS improved staff productivity and simplified accounting workflows, making systems more user-centered and efficient in operation.

This research contributes to the literature by extending the scope of expert system studies into a North African developing countries context, where empirical evidence remains scarce. Unlike prior works that treat AIS quality generically or focus on broader AI tools, this study isolates the specific role of expert systems within AIS. It also offers practitioner-oriented insights that may assist Algerian organizations, technology developers, and policy stakeholders in designing more effective, user-responsive accounting systems that align with modernization goals.

Based on the conceptual and empirical foundations reported above, the following hypotheses are proposed:

H1: The use of expert systems positively impacts the accuracy and reliability of accounting data.

H2: The use of expert systems positively impacts the timeliness of financial information.

H3: The use of expert systems positively impacts the relevance and completeness of information.

H4: The use of expert systems positively impacts the efficiency and ease of system use.

3 METHODOLOGY

3.1 Research Design

To achieve the study's purpose, the research adopted a quantitative, explanatory design to discover the effect of expert systems on the quality of accounting information systems. We examined how the adoption and usage of expert systems affect critical facets of system quality, like the accuracy and reliability of accounting data, the timeliness of financial reporting, the relevance and completeness of information, and the efficiency and ease of system use.

The data were subjected to analysis, and the proposed hypotheses were evaluated via PLS-SEM using SmartPLS software. Hair et al. (2022) emphasize its appropriateness in exploratory research contexts that employ multifaceted modeling structures, non-standardized indicators, and moderate sample sizes, particularly within nascent analytical domains. PLS-SEM facilitated the full assessment of both the measurement model (construct validity and reliability) and the structural model (testing of the hypothesized relationships).

3.2 Research Sample

A simple random sampling method was used to select 73 Algerian accounting practitioners in this study. As pointed out by Rahman et al. (2022), this sampling technique adheres to the principle of equal likelihood, meaning that each member of the population has an equal chance of selection. This strategy enhances sample representativeness and minimizes selection bias, thereby increasing the credibility of the findings.

3.3 Data Collection Tool and Research Data

Data collection was conducted via a structured questionnaire grounded in prior research. The instrument assessed Algerian accountants' views on the application of expert systems and the resulting impact on the quality of accounting information systems. The survey comprised two distinct components: one captured respondent demographics, and the other included predefined items focused on the core research objectives.

Section 1 explored the adoption of expert systems in accounting through a ten-point scale survey. The items were designed to assess both familiarity

with and implementation of such systems in professional practice.

Section 2 focused on the quality of the accounting information system and was developed along four thematic axes. The first axis assessed perceptions of the accuracy and reliability of accounting data. The second examined views on the timeliness of financial information. The third construct examined user perceptions of information relevance and completeness. The fourth focused on perceived system efficiency and ease of use. Each dimension was assessed using five measurement items.

All items employed a five-point Likert scale ranging from "Strongly Disagree (1)" to "Strongly Agree (5)." The questionnaire was distributed electronically to 150 accounting professionals, yielding 81 responses (54% response rate). After excluding eight incomplete submissions, 73 valid responses were retained for analysis, resulting in a usable response rate of 48.7%. Although lower than traditional face-to-face survey rates, online response levels are considered acceptable in academic research, particularly for dispersed professional populations (Nulty, 2008; Evans & Mathur, 2005), due to their cost-effectiveness, convenience, and efficiency.

4 RESULTS

4.1 Descriptive Statistics

The sample comprised 73 Algerian accounting professionals. Table 1 illustrates the distribution of respondents based on their professional categories and years of academic experience. Certified accountants made up 16.4% of the total sample, external auditors accounted for 53.5%, and chartered accountants represented 30.1%.

Table 1. Cross-tabulation of professional category and Years of Experience

Experience (years)	Professional category	Frequency	% within Experience	% of Total
< 5	Certified Accountant	8	42.1%	11.0%
	External auditor	8	42.1%	11.0%
	Chartered Accountant	3	15.8%	4.1%
	Total	19	100.0%	26.0%
5–10	Certified Accountant	3	17.6%	4.1%
	External auditor	12	70.6%	16.4%
	Chartered Accountant	2	11.8%	2.7%
	Total	17	100.0%	23.3%
11–15	Certified Accountant	0	0.0%	0.0%
	External auditor	11	55.0%	15.1%
	Chartered Accountant	9	45.0%	12.3%
	Total	20	100.0%	27.4%
> 15	Certified Accountant	1	5.8%	1.3%
	External auditor	8	47.1%	11.0%
	Chartered Accountant	8	47.1%	11.0%
	Total	17	100.0%	23.3%

Most respondents with fewer than five years of experience were certified accountants and external auditors (42.1%). Just 15.8% chartered accountants were reported in this group. Among those having between 5 and 10 years of experience, the majority were external auditors (70.6%), followed by certified accountants (17.6%), and chartered accountants (11.8%). Among respondents with 11 to 15 years of professional experience, external auditors represented the majority (55%), while chartered accountants comprised 45% of the group. Lastly, respondents with over 15 years of experience were evenly split between external auditors

(47.1%) and chartered accountants (47.1%), followed by certified accountants (5.8%).

4.3 Measurement Model Analysis

4.3.1 Convergent validity Analysis

Table 2 presents a summary of the convergent validity and reliability outcomes for all latent constructs within the measurement model. Convergent validity evaluates whether the indicators of a construct exhibit sufficient shared variance, as determined by outer loadings, composite reliability (CR), and average variance extracted (AVE) (Hair, Hult, Ringle, & Sarstedt, 2022). Most item loadings surpassed the 0.70 threshold, signifying robust construct-item relationships. Four items (B3, D2, E1, E4) exhibited loadings between 0.65 and 0.70; however, they were retained due to their conceptual significance and negligible impact on reliability. CR values ranged from 0.893 to 0.959, and AVE values from 0.627 to 0.739, indicating compliance with recommended measurement standards. These findings confirm adequate convergent validity and internal consistency, thereby supporting the reliability of the measurement model for structural analysis.

Table 2. Convergent Validity (CV) and Construct Reliability (CR) Statistics

Constructs	Items	Factor loading	Average variance extracted	Composite reliability
Adoption of Expert Systems in Accounting	A1	0.780	0.680	0.959
	A2	0.821		
	A3	0.784		
	A4	0.817		
	A5	0.821		
	A6	0.825		
	A7	0.877		
	A8	0.816		
	A9	0.850		
	A10	0.803		
Accuracy and Reliability of Accounting Data	B1	0.769	0.645	0.914
	B2	0.759		
	B3	0.650		
	B4	0.903		
	B5	0.836		
Timeliness of Financial Information	C1	0.790	0.627	0.893
	C2	0.825		
	C3	0.810		
	C4	0.775		
	C5	0.756		
Relevance and Completeness of Information	D1	0.710	0.648	0.900
	D2	0.652		
	D3	0.908		
	D4	0.858		
	D5	0.865		
Efficiency and Ease of System Use	E1	0.674	0.739	0.934
	E2	0.846		
	E3	0.817		
	E4	0.686		
	E5	0.725		

4.3.2 Discriminant Validity Analysis

Discriminate validity pertains to the extent to which a latent construction is genuinely distinct from other constructions within a model. Establishing this validity indicates that each construct embodies a unique dimension not encapsulated by the others (Hair, Hult, Ringle, & Sarstedt, 2022). A frequently utilized method for evaluating discriminant validity is the Fornell-Larcker criterion, which entails comparing the square root of the AVE for each construct with its correlations with other constructs. Discriminate validity is deemed satisfactory when the square root of the AVE (presented on the diagonal in Table 3) surpasses the correlations with other constructs (off-diagonal). As illustrated in Table 3, all diagonal values exceed the inter-construct correlations, signifying that each latent variable is sufficiently distinct. For example, the square root of the AVE for the construct Adoption of Expert Systems in Accounting is 0.815. This value is higher than its observed correlations with the constructs Accuracy and Reliability of Accounting Data (0.621) and Timeliness of Financial Information (0.590). Similarly, Efficiency and Ease of System Use have a diagonal AVE value of 0.792, which is greater than their correlations with all other constructs. These findings confirm that the model satisfies the Fornell-Larcker criterion, demonstrating adequate discriminant validity and supporting the application of the measurement model in subsequent structural analyses.

Table 3. Fornell-Larcker Criterion for Discriminant Validity

Latent Variables	Adoption of Expert Systems in Accounting	Accuracy and Reliability of Accounting Data	Timeliness of Financial Information	Relevance and Completeness of Information	Efficiency and Ease of System Use
Adoption of Expert Systems in Accounting	**0.815**				
Accuracy and Reliability of Accounting Data	0.621	**0.801**			
Timeliness of Financial Information	0.590	0.686	**0.805**		
Relevance and Completeness of Information	0.442	0.579	0.725	**0.753**	
Efficiency and Ease of System Use	0.358	0.352	0.53	0.621	**0.792**

4.4 Structural Model Analysis

4.4.1 Structural Model Quality Assessment

After estimating the structural model, its model's quality was assessed using several standard metrics in PLS-SEM: predictive relevance (Q^2), coefficient of determination (R^2), adjusted R^2, and the goodness-of-fit (GOF) index. As shown in Table 4, all Q^2 values are positive, ranging from 0.039 to 0.234, which indicates that the model has acceptable predictive relevance for the dependent constructs (Hair, Hult, Ringle, & Sarstedt, 2022). The R^2 values, which measure the model's explanatory power, range from 0.128 for Efficiency and Ease of System Use to 0.385 for Accuracy and Reliability of Accounting Data. The adjusted R^2 values are closely aligned with their respective R^2 values, supporting the model's parsimony and structural stability. The model's GOF value is 0.39, exceeding the 0.36 threshold for a large effect size (Wetzels, Odekerken-Schröder, & Van Oppen, 2009), suggesting a strong balance between measurement and structural quality. Collectively, these metrics confirm the robustness and relevance of the model in assessing the impact of the adoption of expert systems on accounting information systems quality in Algeria.

Table 4. Quality Assessment of the Structural Model Using R^2, Q^2, and GOF

Latent Dependent Variables	Q^2 = (1-SSE/BSP)	R-squared	R-squared adjusted	GOF (goodness of fit)
Accuracy and Reliability of Accounting Data	0.234	0.385	0.377	0.39
Timeliness of Financial Information	0.202	0.348	0.339	
Relevance and Completeness of Information	0.109	0.196	0.184	
Efficiency and Ease of System Use	0.039	0.128	0.116	

4.4.2 Hypotheses Testing

The final phase of the structural model evaluation focused on testing the study's hypotheses by analyzing the direct effects of expert systems on key dimensions of AIS quality. Table 5 presents the standardized path coefficients (β), t-values, and p-values for each proposed relationship. The results reveal that the integration of expert systems significantly and positively influences all four targeted constructs. The strongest effect was observed for Accuracy and Reliability of Accounting Data ($\beta = 0.621$, $t = 8.354$, $p < 0.001$), lending strong support to H1 and highlighting the pivotal role of expert systems in enhancing the precision and dependability of financial reporting processes. Similarly, expert systems showed a significant positive impact on Timeliness of Financial Information ($\beta = 0.590$, $t = 6.985$, $p < 0.001$), supporting H2; on Relevance and Completeness of Information ($\beta = 0.442$, $t = 4.198$, $p < 0.001$), confirming H3; and on Efficiency and Ease of System Use ($\beta = 0.407$, $t = 3.438$, $p < 0.001$), validating H4. These findings highlight that the integration of expert systems significantly enhances accounting information systems by improving the accuracy, timeliness, relevance, and usability of financial data. In the Algerian context, such technological adoption strengthens the overall effectiveness and reliability of accounting processes. This affirms the strategic role of expert systems in advancing the performance of accounting functions and ensuring alignment with international standards and best practices.

Table 5. Structural Model Path Coefficients and Hypothesis Testing Results

Hypothesis	Path	β (Coefficient)	t-value	p-value	Supported
H1	Expert Systems → Accuracy and Reliability of Accounting Data	0.621	8.354	<0.001	Yes
H2	Expert Systems → Timeliness of Financial Information	0.590	6.985	<0.001	Yes
H3	Expert Systems → Relevance and Completeness of Information	0.442	4.198	<0.001	Yes
H4	Expert Systems → Efficiency and Ease of System Use	0.407	3.438	<0.001	Yes

5 DISCUSSIONS

The study's findings provide strong empirical support for the theoretical proposition that the application of expert systems substantially improves the functionality of accounting information systems across several domains. These results align with and extend existing literature, confirming that expert systems offer tangible benefits to the accounting function by

enhancing data reliability, decision timeliness, information relevance, and operational efficiency.

First, the significant positive effect of expert systems on the accuracy and reliability of accounting data ($\beta = 0.621$, $p < 0.001$) suggests that automation and embedded intelligence within expert systems can effectively reduce human error and improve the precision of financial records. This supports the findings of Zhang (2021), who demonstrated that integrating artificial intelligence, data mining, and machine learning into accounting information systems significantly improves the accuracy and operational efficiency of data processing, thereby reinforcing the integrity and reliability of financial information.

Second, the impact of expert systems on the timeliness of financial information ($\beta = 0.590$, $p < 0.001$) highlights their utility in streamlining routine accounting operations, thereby accelerating reporting processes. These findings corroborate those of Haddad (2021), who observed that intelligent automation reduces latency in financial disclosures, particularly in environments with limited staffing or manual bottlenecks.

Third, regarding relevance and completeness, expert systems demonstrated a statistically significant positive influence ($\beta = 0.442$, $p < 0.001$). This finding aligns with Kadhim and Al Ani (2024), who emphasized that artificial intelligence-based accounting information systems significantly enhance the accuracy and completeness of accounting outputs, thereby improving user interpretation and aiding informed decision-making.

Fourth, expert systems significantly enhanced efficiency and ease of system use ($\beta = 0.407$, $p < 0.001$). This suggests that these systems not only reduce operational complexity but also improve user interface experiences, a finding consistent with Alrfai et al. (2023), who confirmed that the application of expert systems in accounting information systems significantly improves operational efficiency, reduces complexity, and enhances user experience and ease of use in organizations.

The findings enhance methodological discourse by presenting evidence that PLS-SEM is effective in capturing the influence of emerging technologies on accounting systems. Model quality indices (e.g., $R^2 = 0.385$ for accuracy and reliability, GOF = 0.39) showed a good fit, validating the strength of the chosen model to reflect system-level outcomes in a real-world scenario.

While the study offers valuable insights, its geographic limitation to Algeria suggests the need for broader cross-country empirical validation. Previous studies have focused on more technologically advanced markets without considering how expert systems operate in countries with limited digital infrastructure or different institutional arrangements (Zhen & Zhen, 2024). The implications of the results are also wider for the deployment of smart systems in developing economies.

6 CONCLUSION

This study provides empirical support regarding the role of expert systems in improving AIS performance within the Algerian context. Empirical data gathered from accounting professionals, analyzed using PLS-SEM, indicate that expert systems positively influence key attributes of AIS quality.

These include accuracy and reliability, timeliness of financial reporting, informational relevance and completeness, as well as system efficiency and user-friendliness.

These results highlight the significant advancements of smart technologies within contemporary accounting landscapes. By improving operational performance, expert system technology also contributes to the creation of reliable financial information. This, in turn, is essential for sound decision-making and strengthening organizational openness. These results align with prior empirical studies that demonstrate the potential benefits of implementing AI and expert systems in enhancing data integrity, process automation, and system performance (Al Astal, Nomran, & Milhem, 2025). The study also closes a significant gap in the literature by locating its investigation in a developing country setting, where empirical studies on expert systems and AIS integration are rare. By contributing new empirical insights, the research strengthens the body of literature indicating that technological innovation can

substantially enhance accounting processes, even in environments with underdeveloped digital infrastructure.

From a practical standpoint, these results suggest that organizations aiming to modernize their accounting systems should prioritize the adoption of expert systems as a strategic tool. Additionally, policymakers and educational institutions may consider integrating training on knowledge-based system technologies to build the digital capabilities of accounting professionals. Future research could expand this work by examining longitudinal effects, incorporating other AI-based tools, or exploring sector-specific applications of expert systems in accounting. Cross-country comparisons may also offer deeper insights into contextual factors that mediate the relationship between expert systems and AIS effectiveness.

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