




Designing a Model of the Impact of Artificial Intelligence Capabilities in Accounting Systems on Reducing Errors in Financial Reports

Noshin Sheikh^{1*} 

¹ M.Sc., Department of Accounting, Shahid Beheshti University, Tehran, Iran

* Corresponding author email address: Sheikh.nooshin69@gmail.com

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Abstract

The present study aimed to design and validate a model explaining the impact of artificial intelligence capabilities in accounting systems on reducing financial reporting errors in organizations and financial institutions. This study was conducted using a mixed-methods exploratory sequential design. In the qualitative phase, semi-structured interviews were conducted with 18 university professors, financial managers, auditors, and accounting information system specialists in Tehran using purposeful and snowball sampling methods until theoretical saturation was achieved. The qualitative data were analyzed through thematic analysis and coding procedures using MAXQDA software. In the quantitative phase, the statistical population consisted of accountants, financial managers, auditors, and accounting system specialists employed in financial institutions and private companies in Tehran during 2026. Based on Cochran's formula, 384 participants were selected through stratified random sampling. Data were collected using a researcher-developed questionnaire designed according to the qualitative findings and existing theoretical literature. The validity of the instrument was confirmed through expert evaluation and confirmatory factor analysis, while reliability was assessed using Cronbach's alpha and composite reliability coefficients. Quantitative data were analyzed using SPSS version 27 and SmartPLS version 4 through descriptive statistics, confirmatory factor analysis, correlation analysis, and structural equation modeling. The findings demonstrated that all dimensions of artificial intelligence capabilities had significant positive effects on reducing financial reporting errors. Real-time financial monitoring had the strongest effect on reducing financial reporting errors ($\beta = 0.39, p < 0.001$), followed by automated anomaly detection ($\beta = 0.34, p < 0.001$), decision-support functionality ($\beta = 0.31, p < 0.001$), intelligent data processing ($\beta = 0.28, p < 0.001$), predictive analytics capability ($\beta = 0.22, p < 0.001$), machine learning integration ($\beta = 0.19, p < 0.001$), and system adaptability ($\beta = 0.17, p < 0.001$). The structural model exhibited satisfactory fit indices, and the coefficient of determination indicated that artificial intelligence capabilities explained 74% of the variance in reduction of financial reporting errors. The findings indicate that artificial intelligence capabilities significantly improve the accuracy, transparency, and reliability of financial reporting systems by enhancing monitoring processes, anomaly detection, predictive analysis, and intelligent decision-making. The study confirms that intelligent accounting technologies can substantially reduce financial reporting errors and strengthen organizational financial governance. Therefore, organizations are encouraged to invest in intelligent accounting infrastructures and develop technological readiness to improve financial reporting quality and operational efficiency.

Keywords: Artificial intelligence, accounting systems, financial reporting errors, intelligent auditing, financial reporting quality, machine learning, anomaly detection, structural equation modeling.

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1. Introduction

The rapid advancement of digital technologies has fundamentally transformed organizational structures,

financial processes, and accounting systems across the world. Among emerging technologies, artificial intelligence has attracted considerable attention because of its capacity



to automate complex procedures, analyze extensive datasets, identify hidden patterns, and improve decision-making quality in accounting and financial environments. Artificial intelligence is no longer considered merely a supportive technological tool; rather, it has become an essential strategic capability that significantly influences the quality, transparency, efficiency, and reliability of accounting information systems. Modern organizations increasingly rely on intelligent technologies to improve financial reporting procedures, minimize human errors, strengthen internal controls, and enhance compliance with accounting standards and regulatory frameworks [1-3].

Financial reporting represents one of the most critical functions of accounting systems because financial reports constitute the primary source of information for investors, managers, regulators, creditors, and other stakeholders. The quality and accuracy of financial reports directly affect organizational credibility, investment decisions, resource allocation, and market confidence. However, traditional accounting systems are frequently exposed to different types of reporting errors, including computational inaccuracies, omission and duplication errors, fraudulent manipulations, delayed reporting, and deficiencies in data processing and verification procedures. Such errors may emerge because of human limitations, inadequate internal controls, information overload, or inefficient auditing practices. Consequently, organizations are increasingly motivated to integrate artificial intelligence capabilities into accounting systems to improve reporting accuracy and reduce the probability of financial misstatements [4-6].

Artificial intelligence technologies offer multiple capabilities that can substantially improve accounting operations and financial reporting quality. Intelligent data processing systems can rapidly analyze large volumes of structured and unstructured financial information with greater precision and consistency than conventional manual procedures. Machine learning algorithms can continuously learn from previous accounting data, detect anomalies, and identify irregular financial transactions that may indicate errors or fraudulent activities. Predictive analytics capabilities further enable organizations to forecast financial trends, evaluate financial risks, and optimize budgeting and decision-making processes. These developments have created new opportunities for improving the efficiency and reliability of financial accounting and auditing systems [7-9].

One of the most important applications of artificial intelligence in accounting systems involves anomaly

detection and fraud identification. Traditional auditing and monitoring systems often struggle to identify complex irregularities hidden within massive financial datasets. In contrast, artificial intelligence technologies, particularly deep learning and intelligent detection systems, can recognize suspicious patterns and deviations from normal financial behavior with high accuracy. Abu-Khadra et al. emphasized that artificial intelligence significantly improves fraud detection processes in auditing by enabling continuous monitoring and intelligent analysis of financial transactions [10]. Similarly, Farhadi Touski and Doustian demonstrated that deep learning technologies enhance internal auditing processes by facilitating accurate anomaly detection in financial accounting data [6]. Such capabilities contribute directly to reducing financial reporting errors and improving the reliability of organizational financial information.

The integration of artificial intelligence into accounting systems also contributes to increasing operational efficiency and reducing costs associated with financial management and auditing activities. Artificial intelligence can automate repetitive and time-consuming accounting tasks, including transaction classification, reconciliation procedures, invoice processing, and compliance verification. This automation reduces dependence on manual operations and minimizes the possibility of human error. Moreover, intelligent accounting systems can improve the speed and quality of financial analysis, thereby enabling organizations to respond more effectively to dynamic economic conditions and competitive market environments [5, 7, 11].

In recent years, the application of artificial intelligence in management accounting and financial forecasting has become increasingly important. Intelligent analytical systems are capable of processing large amounts of historical and real-time financial data to generate accurate predictions regarding organizational performance, budgeting requirements, and financial risks. Darabi and Dolatshahi reported that artificial intelligence significantly improves budgeting optimization and forecasting accuracy in manufacturing companies through advanced analytical capabilities and predictive modeling techniques [8]. Such improvements not only support managerial decision-making but also reduce the likelihood of reporting inconsistencies arising from inaccurate estimations and financial planning errors.

Another important dimension of artificial intelligence in accounting involves enhancing sustainability reporting and compliance management. Organizations today face increasing pressure to provide transparent and accurate

sustainability disclosures in addition to traditional financial statements. Generative artificial intelligence and advanced accounting analytics can improve the quality of digital sustainability reporting by strengthening internal control systems and facilitating more comprehensive data analysis. Saghafi and Parsapour emphasized that artificial intelligence-based accounting data analysis positively affects the quality of sustainability reporting through enhanced internal control mechanisms and improved data transparency [12]. This indicates that artificial intelligence not only improves conventional accounting practices but also supports broader organizational accountability and governance objectives.

Despite the numerous opportunities associated with artificial intelligence adoption in accounting systems, organizations also encounter significant challenges and barriers during implementation. One of the major concerns relates to ethical and legal implications associated with intelligent technologies. The increasing autonomy of artificial intelligence systems raises questions regarding accountability, transparency, privacy, and legal responsibility in cases of system errors or fraudulent decisions. Rostami Zabol highlighted the legal and criminal liability challenges arising from autonomous artificial intelligence systems within accounting and organizational contexts [13]. Similarly, Esmaeili Abdar discussed the organizational challenges and consequences of artificial intelligence implementation, emphasizing concerns related to technological dependence, cybersecurity threats, ethical dilemmas, and workforce displacement [14]. These challenges demonstrate that successful implementation of artificial intelligence in accounting requires not only technological infrastructure but also comprehensive governance and regulatory frameworks.

The adoption of artificial intelligence technologies in accounting systems is further influenced by organizational, professional, and behavioral factors. Internal auditors' knowledge, professional skepticism, technological competence, and attitudes toward innovation play critical roles in determining the successful integration of intelligent systems into accounting and auditing procedures. Moshayekhi and Amiroollah found that the knowledge and professional skepticism of internal auditors significantly affect the adoption of artificial intelligence technologies in auditing environments [15]. Similarly, Mashayekhi and Amrollahi identified multiple organizational and professional factors influencing the acceptance of artificial intelligence among internal auditors, including

technological readiness, managerial support, perceived usefulness, and professional trust [16]. These findings suggest that human and organizational dimensions remain central to the effective implementation of intelligent accounting systems.

Trust in accounting information systems also represents a key factor influencing the effectiveness of artificial intelligence in financial reporting processes. Users may hesitate to rely on intelligent systems if they perceive algorithmic outputs as opaque, unreliable, or difficult to interpret. Sheikh demonstrated that the application of artificial intelligence positively affects financial reporting quality through the mediating role of user trust in accounting systems [4]. This finding highlights the importance of developing transparent, explainable, and user-oriented intelligent systems capable of gaining stakeholder confidence and facilitating broader organizational acceptance.

The transformation driven by artificial intelligence extends beyond accounting and auditing functions and affects broader organizational processes and performance outcomes. Artificial intelligence applications have been associated with improvements in employee performance, human resource management, customer loyalty, banking security, and educational advancement [17-19]. Khalafi et al. proposed that artificial intelligence-based security systems improve customer trust and loyalty within financial services by strengthening reliability and operational efficiency [11]. These findings indicate that artificial intelligence creates integrated organizational value by simultaneously improving technological, managerial, and financial dimensions of performance.

In the accounting profession, artificial intelligence is increasingly viewed as a transformative force capable of reshaping traditional professional roles and practices. Intelligent systems can perform sophisticated analytical procedures, identify hidden financial relationships, and generate real-time insights that were previously impossible using conventional accounting techniques. Adnan Hammoud et al. emphasized the feasibility and strategic importance of employing modern artificial intelligence technologies to improve national auditing processes and strengthen financial oversight mechanisms [20]. Likewise, Khan et al. described artificial intelligence as both an opportunity and a challenge for accounting and auditing professions because of its potential to improve efficiency while simultaneously requiring substantial professional adaptation and technological competency development [2].

Furthermore, artificial intelligence contributes significantly to strengthening tax compliance, financial regulation, and investment efficiency. Nembe et al. argued that intelligent technologies enhance tax compliance by improving monitoring capabilities, regulatory transparency, and data analysis efficiency [21]. Khaleghizadeh Dehkordi et al. similarly emphasized the role of artificial intelligence methods in explaining investment efficiency and improving financial performance measurement systems [22]. These developments indicate that artificial intelligence has become an essential component of modern financial governance and organizational control systems.

Although previous studies have investigated various aspects of artificial intelligence in accounting, auditing, sustainability reporting, financial forecasting, and organizational management, there remains a significant research gap regarding the integrated modeling of artificial intelligence capabilities and their collective influence on reducing financial reporting errors. Most existing studies have examined isolated dimensions of artificial intelligence applications without developing a comprehensive model encompassing intelligent data processing, machine learning integration, predictive analytics, decision-support systems, anomaly detection, and real-time financial monitoring simultaneously. Moreover, limited empirical research has specifically focused on accounting environments in developing economies and organizational contexts characterized by rapid digital transformation and evolving regulatory structures. Therefore, a comprehensive examination of the mechanisms through which artificial intelligence capabilities influence financial reporting error reduction is necessary for both theoretical development and practical implementation.

Accordingly, the present study aims to design a model of the impact of artificial intelligence capabilities in accounting systems on reducing errors in financial reports.

2. Methodology

The present study was conducted with the aim of designing a model explaining the impact of artificial intelligence capabilities in accounting systems on the reduction of errors in financial reports. Considering the exploratory nature of the study and the need to identify dimensions, components, and causal relationships among variables, a mixed-methods design based on an exploratory sequential approach was adopted. In the qualitative phase, the researchers attempted to identify the dimensions and

indicators of artificial intelligence capabilities in accounting systems and their effects on financial reporting accuracy through thematic analysis and expert interviews. Subsequently, in the quantitative phase, the relationships among the identified components were tested and validated using structural equation modeling. The statistical population in the qualitative phase consisted of university faculty members in accounting and financial management, senior financial managers, certified public accountants, and specialists in accounting information systems working in Tehran. Purposeful sampling combined with the snowball technique was employed, and interviews continued until theoretical saturation was achieved. Saturation was reached after conducting 18 semi-structured interviews. In the quantitative phase, the statistical population included financial managers, accountants, auditors, and accounting system specialists employed in private companies, financial institutions, and audit firms in Tehran during 2026. Based on Cochran's sample size formula and considering the large population size, a sample of 384 participants was determined. Participants were selected using stratified random sampling in proportion to the size of organizations and institutions. Inclusion criteria included at least a bachelor's degree in accounting, financial management, or related disciplines, a minimum of three years of professional experience, and familiarity with intelligent accounting systems and digital financial technologies.

Data collection in the qualitative phase was conducted using semi-structured interviews designed based on the literature review and the objectives of the study. The interview protocol included questions related to the dimensions of artificial intelligence capabilities in accounting systems, mechanisms through which intelligent technologies reduce financial reporting errors, barriers to implementation, and organizational factors influencing the effectiveness of AI-based accounting systems. Each interview lasted between 45 and 75 minutes and was conducted either in person or through secure online platforms. To ensure the credibility and trustworthiness of qualitative data, member checking, peer review, and triangulation techniques were utilized. In the quantitative phase, data were collected using a researcher-developed questionnaire designed according to the findings of the qualitative phase and existing theoretical literature. The questionnaire consisted of two sections: demographic characteristics and specialized items related to artificial intelligence capabilities and financial reporting error reduction. The dimensions of artificial intelligence

capabilities included intelligent data processing, automated anomaly detection, predictive analytics capability, machine learning integration, decision-support functionality, real-time financial monitoring, and system adaptability. The dimensions related to reduction of financial reporting errors included reduction of computational errors, enhancement of reporting accuracy, reduction of omission and duplication errors, improvement of compliance with accounting standards, and enhancement of transparency and reliability of financial information. Questionnaire items were measured using a five-point Likert scale ranging from completely disagree to completely agree. Content validity of the instrument was confirmed through expert panel evaluation involving ten university professors and senior accounting specialists. Construct validity was assessed through confirmatory factor analysis. Reliability was examined using Cronbach's alpha coefficient and composite reliability indices, all of which exceeded the acceptable threshold of 0.70, indicating satisfactory internal consistency and reliability of the measurement instrument.

In the qualitative phase, thematic analysis was employed to analyze interview data. Interview transcripts were coded through open, axial, and selective coding procedures. Initial concepts were extracted and subsequently categorized into broader conceptual themes reflecting the major dimensions of artificial intelligence capabilities and their impact on reducing financial reporting errors. MAXQDA software was used to facilitate coding and organization of qualitative data. In the quantitative phase, descriptive statistics including mean, standard deviation, frequency, and percentage were used to describe demographic characteristics and study variables. Inferential statistical analyses were conducted using SPSS version 27 and SmartPLS version 4. First, the measurement model was evaluated through confirmatory factor analysis to assess factor loadings, convergent validity, discriminant validity, composite reliability, and average

variance extracted. Subsequently, the structural model was examined to test the hypothesized relationships among variables. Path coefficients, t-values, coefficient of determination, predictive relevance, and model fit indices were utilized to evaluate the adequacy of the proposed model. Additionally, bootstrapping procedures were conducted to assess the significance and stability of parameter estimates. The significance level for all statistical tests was considered to be 0.05.

3. Findings and Results

The demographic findings indicated that among the 384 participants, 228 individuals (59.38%) were male and 156 individuals (40.62%) were female. Regarding age distribution, 74 participants (19.27%) were between 25 and 34 years old, 168 participants (43.75%) were between 35 and 44 years old, 103 participants (26.82%) were between 45 and 54 years old, and 39 participants (10.16%) were older than 55 years. In terms of educational level, 241 participants (62.76%) held a bachelor's degree, 118 participants (30.73%) possessed a master's degree, and 25 participants (6.51%) held doctoral degrees in accounting, financial management, or related disciplines. The findings also demonstrated that 147 participants (38.28%) had between 3 and 7 years of professional experience, 169 participants (44.01%) had between 8 and 15 years of experience, and 68 participants (17.71%) had more than 15 years of work experience. Furthermore, the majority of respondents were employed in private companies and financial institutions, while a smaller proportion worked in audit firms and consulting organizations. These findings suggest that the participants possessed sufficient professional experience and academic knowledge to provide reliable responses regarding artificial intelligence capabilities in accounting systems and their influence on financial reporting accuracy.

Table 1. Descriptive Statistics of Research Variables

Variables	Mean	Standard Deviation	Minimum	Maximum
Intelligent Data Processing	4.18	0.63	2.11	5.00
Automated Anomaly Detection	4.26	0.58	2.34	5.00
Predictive Analytics Capability	4.11	0.67	2.02	5.00
Machine Learning Integration	4.07	0.71	1.96	5.00
Decision-Support Functionality	4.22	0.60	2.18	5.00
Real-Time Financial Monitoring	4.31	0.55	2.41	5.00
System Adaptability	4.03	0.73	1.87	5.00
Reduction of Computational Errors	4.37	0.52	2.55	5.00
Enhancement of Reporting Accuracy	4.41	0.49	2.74	5.00
Reduction of Omission and Duplication Errors	4.29	0.57	2.26	5.00
Compliance with Accounting Standards	4.18	0.61	2.08	5.00

Transparency and Reliability of Financial Information	4.34	0.54	2.39	5.00
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The descriptive statistics presented in Table 1 demonstrate that the mean scores of all study variables were above the theoretical midpoint of the scale, indicating generally favorable perceptions among participants regarding the role of artificial intelligence capabilities in accounting systems. Among the AI capability dimensions, real-time financial monitoring obtained the highest mean score (M = 4.31, SD = 0.55), suggesting that participants considered continuous monitoring and real-time processing of financial data as one of the most influential capabilities in minimizing reporting errors. Automated anomaly detection also exhibited a high mean score (M = 4.26, SD = 0.58), reflecting the perceived effectiveness of intelligent systems

in identifying inconsistencies and unusual accounting transactions. On the outcome side, enhancement of reporting accuracy achieved the highest mean score (M = 4.41, SD = 0.49), followed closely by reduction of computational errors (M = 4.37, SD = 0.52). These findings indicate that respondents strongly believed AI-driven accounting systems contribute substantially to improving the precision, consistency, and reliability of financial reporting processes. The relatively low standard deviations observed across variables further indicate a high degree of consensus among participants concerning the effectiveness of AI technologies in accounting environments.

Table 2. Confirmatory Factor Analysis Results for Measurement Model

Variables	Factor Loading	Cronbach's Alpha	Composite Reliability	AVE
Intelligent Data Processing	0.84	0.88	0.91	0.67
Automated Anomaly Detection	0.87	0.90	0.92	0.70
Predictive Analytics Capability	0.82	0.87	0.90	0.65
Machine Learning Integration	0.80	0.86	0.89	0.63
Decision-Support Functionality	0.85	0.89	0.91	0.68
Real-Time Financial Monitoring	0.88	0.91	0.93	0.72
System Adaptability	0.81	0.85	0.88	0.62
Reduction of Financial Reporting Errors	0.91	0.93	0.94	0.75

The results presented in Table 2 indicate that the measurement model possessed acceptable psychometric properties. All factor loadings exceeded the minimum acceptable threshold of 0.70, demonstrating strong relationships between observed indicators and their corresponding latent constructs. The highest factor loading was related to reduction of financial reporting errors (0.91), indicating that the indicators associated with this construct explained a substantial proportion of variance in the latent variable. Cronbach's alpha coefficients ranged from 0.85 to 0.93, confirming satisfactory internal consistency among the

measurement items. Composite reliability values also exceeded the recommended criterion of 0.70 for all constructs, indicating robust reliability of the measurement model. Moreover, the average variance extracted values ranged from 0.62 to 0.75, which were above the acceptable cutoff value of 0.50, thereby supporting convergent validity. Overall, the findings confirmed that the measurement instrument possessed adequate validity and reliability for testing the structural relationships proposed in the research model.

Table 3. Correlation Matrix among Research Variables

Variables	1	2	3	4	5	6	7	8
1. Intelligent Data Processing	1							
2. Automated Anomaly Detection	0.71	1						
3. Predictive Analytics Capability	0.66	0.73	1					
4. Machine Learning Integration	0.62	0.69	0.75	1				
5. Decision-Support Functionality	0.68	0.72	0.70	0.67	1			
6. Real-Time Financial Monitoring	0.74	0.78	0.69	0.65	0.76	1		
7. System Adaptability	0.59	0.63	0.68	0.72	0.64	0.61	1	
8. Reduction of Financial Reporting Errors	0.77	0.84	0.75	0.72	0.81	0.86	0.69	1

The correlation analysis revealed significant positive relationships among all research variables. The strongest correlation was observed between real-time financial monitoring and reduction of financial reporting errors ($r = 0.86$), indicating that continuous monitoring and immediate processing of financial data substantially contribute to minimizing reporting inaccuracies. Automated anomaly detection also demonstrated a strong positive correlation with reduction of financial reporting errors ($r = 0.84$), suggesting that intelligent systems capable of identifying unusual transactions and inconsistencies can effectively reduce accounting and reporting mistakes. Additionally,

decision-support functionality exhibited a high correlation with financial reporting error reduction ($r = 0.81$), emphasizing the importance of intelligent analytical support in improving managerial and accounting decisions. The moderate-to-high intercorrelations among AI capability dimensions indicate conceptual coherence among the constructs while simultaneously suggesting that each dimension contributes uniquely to the overall explanatory model. The absence of excessively high correlations above 0.90 further confirmed that multicollinearity was not a serious concern in the structural model.

Table 4. Structural Equation Modeling Results

Hypothesized Paths	Path Coefficient (β)	t-value	p-value	Result
Intelligent Data Processing → Reduction of Financial Reporting Errors	0.28	5.91	0.001	Supported
Automated Anomaly Detection → Reduction of Financial Reporting Errors	0.34	7.26	0.001	Supported
Predictive Analytics Capability → Reduction of Financial Reporting Errors	0.22	4.87	0.001	Supported
Machine Learning Integration → Reduction of Financial Reporting Errors	0.19	4.11	0.001	Supported
Decision-Support Functionality → Reduction of Financial Reporting Errors	0.31	6.42	0.001	Supported
Real-Time Financial Monitoring → Reduction of Financial Reporting Errors	0.39	8.14	0.001	Supported
System Adaptability → Reduction of Financial Reporting Errors	0.17	3.88	0.001	Supported

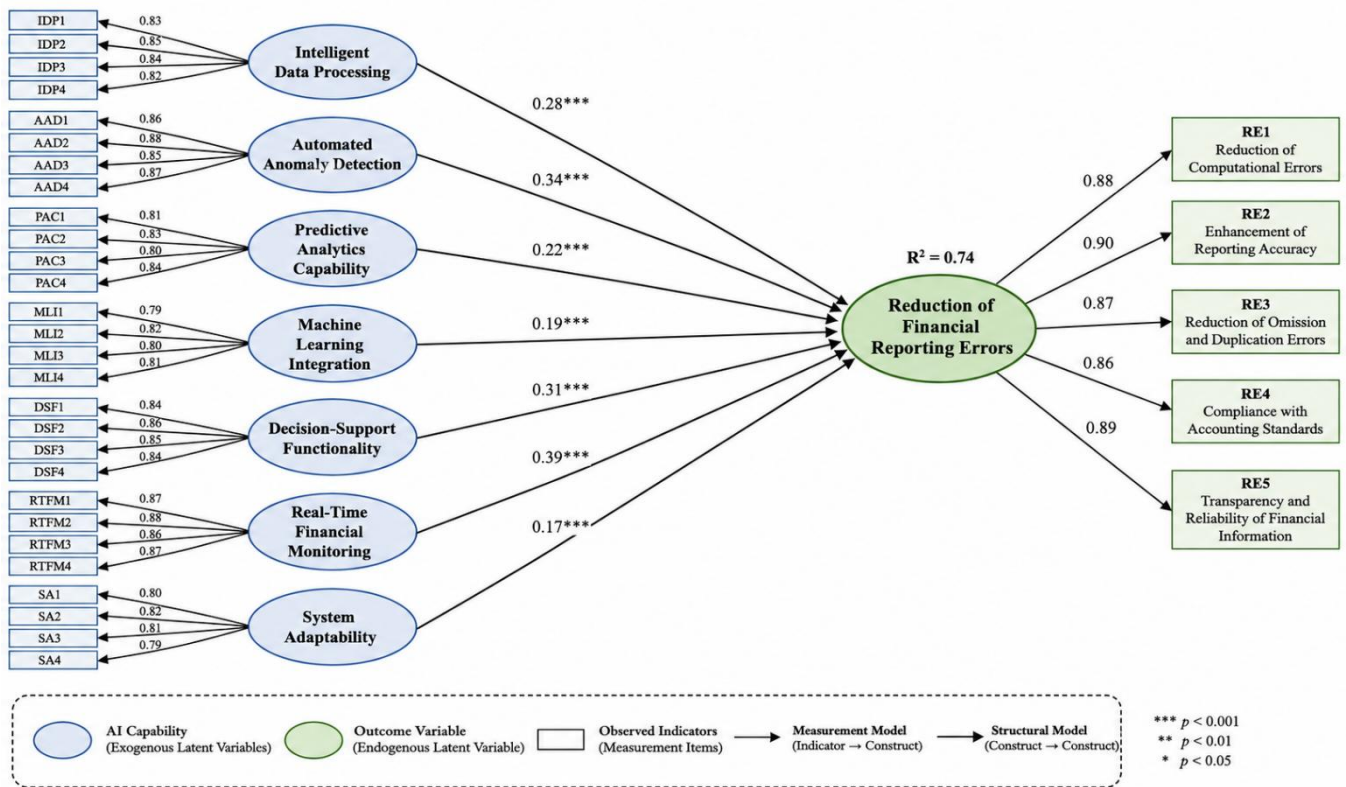


Figure 1. Structural Model of the Impact of Artificial Intelligence Capabilities on Reduction of Financial Reporting Errors

The structural equation modeling results demonstrated that all proposed relationships in the conceptual model were statistically significant. Real-time financial monitoring had

the strongest direct effect on reduction of financial reporting errors ($\beta = 0.39$, $t = 8.14$, $p < 0.001$), indicating that the ability of accounting systems to continuously monitor

transactions and detect inconsistencies in real time plays a critical role in improving reporting accuracy. Automated anomaly detection also exerted a substantial positive effect on reducing financial reporting errors ($\beta = 0.34$, $t = 7.26$, $p < 0.001$), emphasizing the effectiveness of intelligent detection algorithms in preventing inaccuracies and irregularities in accounting reports. Decision-support functionality similarly demonstrated a strong positive impact ($\beta = 0.31$, $t = 6.42$, $p < 0.001$), suggesting that AI-assisted analytical recommendations enhance the quality and

precision of financial decisions. Although system adaptability and machine learning integration exhibited comparatively smaller coefficients, their effects remained statistically significant, indicating that adaptive learning capabilities and intelligent automation collectively contribute to reducing financial reporting errors. Overall, the findings provide strong empirical support for the proposed model and confirm the influential role of AI capabilities in enhancing the quality, transparency, and reliability of financial reporting systems.

Table 5. Model Fit Indices

Fit Index	Obtained Value	Recommended Value	Status
SRMR	0.049	< 0.08	Acceptable
NFI	0.93	> 0.90	Acceptable
CFI	0.95	> 0.90	Acceptable
RMSEA	0.052	< 0.08	Acceptable
χ^2/df	2.31	< 3.00	Acceptable
R ²	0.74	> 0.50	Strong

The model fit indices reported in Table 5 indicate that the proposed structural model demonstrated a satisfactory level of fit with the observed data. The SRMR value of 0.049 and RMSEA value of 0.052 were both below the recommended threshold of 0.08, indicating a low level of residual error and adequate approximation of the model to the empirical data. Similarly, the comparative fit index and normed fit index exceeded the acceptable benchmark of 0.90, confirming the robustness of the conceptual model. The chi-square to degrees of freedom ratio was 2.31, which also reflected acceptable model fit. Furthermore, the coefficient of determination ($R^2 = 0.74$) revealed that approximately 74% of the variance in reduction of financial reporting errors was explained by the dimensions of artificial intelligence capabilities included in the model. This substantial explanatory power highlights the importance of intelligent accounting technologies in improving the accuracy, reliability, and transparency of organizational financial reporting systems.

4. Discussion and Conclusion

The findings of the present study demonstrated that artificial intelligence capabilities in accounting systems exert significant positive effects on reducing financial reporting errors. The structural equation modeling results indicated that all dimensions of artificial intelligence capabilities, including intelligent data processing, automated

anomaly detection, predictive analytics capability, machine learning integration, decision-support functionality, real-time financial monitoring, and system adaptability, significantly contributed to improving the accuracy and reliability of financial reporting. Among these dimensions, real-time financial monitoring and automated anomaly detection exhibited the strongest effects on reducing financial reporting errors. These findings confirm the transformative role of artificial intelligence technologies in modern accounting systems and highlight the importance of intelligent financial infrastructures in minimizing reporting inaccuracies, enhancing transparency, and strengthening organizational accountability.

One of the major findings of this study was the strong influence of real-time financial monitoring on reducing financial reporting errors. This result suggests that continuous monitoring and immediate processing of accounting data enable organizations to identify inconsistencies, detect abnormal transactions, and correct reporting deficiencies before they evolve into substantial financial problems. Intelligent real-time monitoring systems improve the timeliness and precision of financial information by continuously evaluating transactional patterns and identifying deviations from expected accounting behaviors. This finding is consistent with the results reported by Cao et al., who emphasized that artificial intelligence technologies significantly improve accounting and auditing efficiency through continuous data analysis and

intelligent automation [7]. Similarly, Calado and Veloso argued that artificial intelligence enhances organizational compliance, transparency, and value co-creation by improving the speed and reliability of accounting information systems [3]. The present findings further support the argument that intelligent monitoring systems are becoming essential organizational tools for maintaining financial reporting quality in increasingly complex business environments.

The findings also revealed that automated anomaly detection significantly contributes to reducing financial reporting errors. Intelligent anomaly detection systems use machine learning and deep learning algorithms to identify suspicious accounting entries, unusual transactional patterns, and inconsistencies within financial datasets. Such systems improve the ability of organizations to detect reporting irregularities that may remain hidden within traditional manual auditing procedures. These results align closely with the findings of Abu-Khadra et al., who demonstrated that artificial intelligence plays a crucial role in fraud detection and auditing effectiveness in digital accounting environments [10]. Likewise, Farhadi Touski and Doustian concluded that deep learning technologies substantially improve internal auditing quality by enabling accurate anomaly detection in financial accounting data [6]. The consistency between the present findings and prior studies indicates that anomaly detection capabilities represent one of the most valuable applications of artificial intelligence in modern accounting systems because they directly reduce financial inaccuracies and strengthen internal control mechanisms.

Another important finding of the study concerned the positive role of intelligent data processing in improving financial reporting quality. Intelligent data processing systems can rapidly analyze large volumes of accounting data with higher consistency and lower error rates compared with traditional accounting procedures. The findings suggest that intelligent automation reduces human involvement in repetitive accounting activities and consequently minimizes the probability of computational and recording errors. These findings are supported by the work of Saadati et al., who emphasized the strategic importance of artificial intelligence technologies in accounting and management auditing processes [5]. Mirzaei also reported that artificial intelligence creates substantial opportunities for improving accounting efficiency and reducing operational complexities in financial reporting systems [1]. The present study extends these findings by empirically demonstrating that intelligent

data processing directly contributes to error reduction and reporting reliability.

The results additionally showed that predictive analytics capability significantly affects the reduction of financial reporting errors. Predictive analytics enables organizations to anticipate financial trends, estimate potential risks, and identify problematic patterns before they negatively influence financial reporting quality. This capability allows managers and accountants to make more accurate financial decisions and reduce estimation-related reporting inaccuracies. The findings correspond with the study conducted by Darabi and Dolatshahi, who demonstrated that artificial intelligence significantly improves budgeting optimization and financial forecasting accuracy in management accounting systems [8]. Predictive analytical systems provide organizations with more accurate and data-driven insights, thereby reducing uncertainty and enhancing financial planning quality. Consequently, the present study confirms that predictive capabilities are not merely supportive analytical tools but critical determinants of financial reporting precision.

Machine learning integration was another dimension found to significantly reduce financial reporting errors. Machine learning algorithms continuously learn from historical accounting information and improve system performance through adaptive analytical processes. Such adaptive learning mechanisms enable accounting systems to refine error detection procedures, optimize financial classifications, and improve reporting consistency over time. This finding is compatible with the observations of Khan et al., who emphasized that artificial intelligence technologies create important opportunities for transforming accounting and auditing processes through adaptive and intelligent automation [2]. Moreover, Adnan Hammoud et al. argued that the utilization of modern artificial intelligence technologies substantially improves auditing procedures and financial oversight quality [20]. The present study therefore supports the notion that machine learning integration enhances organizational capacity to manage complex accounting environments with greater precision and efficiency.

The significant effect of decision-support functionality on reducing financial reporting errors further highlights the managerial value of artificial intelligence systems. Intelligent decision-support systems provide managers and accountants with analytical recommendations, scenario evaluations, and data-driven insights that improve financial decision-making processes. Such systems reduce the

likelihood of judgmental errors and increase the quality of managerial assessments related to financial reporting. These findings are supported by Khaleghizadeh Dehkordi et al., who emphasized the role of artificial intelligence methods in improving investment efficiency and performance measurement accuracy [22]. Similarly, Najari highlighted the importance of artificial intelligence in improving financial cost analysis and organizational financial evaluations [9]. The current findings indicate that intelligent decision-support mechanisms are becoming indispensable components of contemporary accounting systems because they strengthen managerial precision and reduce the risk of inaccurate reporting decisions.

The findings also demonstrated that system adaptability significantly contributes to reducing financial reporting errors. Adaptive accounting systems possess the ability to adjust to changing financial regulations, organizational conditions, and reporting standards without requiring extensive manual interventions. Such adaptability enables organizations to maintain reporting consistency and compliance even within rapidly changing economic environments. This result reflects the arguments proposed by Nembe et al., who noted that artificial intelligence strengthens tax compliance and financial regulation through improved monitoring and adaptive analytical capabilities [21]. The adaptability of intelligent systems therefore represents a critical organizational advantage because it facilitates long-term financial stability and regulatory alignment.

Another important aspect of the findings concerns the role of trust and professional readiness in successful artificial intelligence adoption. The positive relationships observed among artificial intelligence capabilities and financial reporting quality suggest that organizations increasingly perceive intelligent systems as reliable tools for accounting and auditing activities. These findings align with the study conducted by Sheikh, who found that user trust mediates the relationship between artificial intelligence implementation and financial reporting quality [4]. If users perceive intelligent systems as transparent, reliable, and effective, they are more likely to depend on algorithmic outputs during financial decision-making and reporting activities. Similarly, Moshayekhi and Amirollah emphasized that internal auditors' knowledge and professional skepticism strongly influence artificial intelligence adoption in accounting environments [15]. Mashayekhi and Amrollahi also identified organizational and professional readiness as critical factors affecting artificial intelligence

implementation among auditors [16]. Collectively, these findings suggest that technological success in accounting systems depends not only on software capabilities but also on human trust, organizational culture, and professional competencies.

The present findings additionally support the broader perspective that artificial intelligence contributes to overall organizational transformation beyond accounting functions alone. Previous studies have shown that artificial intelligence positively influences employee performance, customer loyalty, organizational efficiency, and human resource management [11, 17, 18]. The integration of intelligent technologies into accounting systems therefore represents part of a wider organizational movement toward digital transformation and intelligent governance structures. Artificial intelligence enhances coordination among financial processes, strengthens organizational control systems, and improves strategic decision-making quality across different operational dimensions.

Despite the substantial benefits associated with artificial intelligence capabilities, the findings of this study should also be interpreted in light of the ethical, legal, and organizational challenges associated with intelligent technologies. Artificial intelligence systems may create concerns related to data privacy, cybersecurity, algorithmic transparency, accountability, and legal responsibility. Rostami Zabol emphasized that autonomous artificial intelligence systems generate significant legal and criminal liability challenges within organizational and financial contexts [13]. Likewise, Esmaeili Abdar highlighted the organizational risks and consequences associated with artificial intelligence implementation, including technological dependence and ethical uncertainty [14]. Consequently, organizations must adopt comprehensive governance frameworks and ethical guidelines to ensure that artificial intelligence systems operate responsibly and transparently within accounting environments.

Overall, the findings of the present study provide strong empirical evidence regarding the effectiveness of artificial intelligence capabilities in reducing financial reporting errors and improving accounting system performance. The study contributes to the existing literature by developing and validating a comprehensive model that integrates multiple dimensions of artificial intelligence capabilities within accounting systems. The results demonstrate that intelligent technologies significantly improve financial reporting quality through enhanced monitoring, anomaly detection, predictive analysis, adaptive learning, and intelligent

decision support. Therefore, artificial intelligence should be regarded not merely as a technological innovation but as a strategic organizational capability capable of transforming accounting practices, strengthening financial governance, and enhancing the reliability and transparency of financial information.

One of the limitations of the present study was its geographical concentration on organizations and financial institutions located in Tehran, which may limit the generalizability of the findings to other regions and economic contexts. In addition, the study relied primarily on self-reported questionnaire data, and participants' perceptions may have been influenced by personal attitudes toward technology adoption and organizational culture. Another limitation involved the cross-sectional nature of the quantitative phase, which restricted the ability to evaluate long-term causal relationships and technological changes over time. Furthermore, differences in organizational technological maturity and infrastructure were not examined separately, which may have affected the implementation and effectiveness of artificial intelligence capabilities in accounting systems.

Future studies are recommended to investigate the longitudinal effects of artificial intelligence adoption on financial reporting quality and organizational performance over extended periods. Researchers may also examine the moderating role of organizational culture, technological readiness, cybersecurity infrastructure, and employee digital competencies in the relationship between artificial intelligence capabilities and accounting effectiveness. Comparative studies across different industries, countries, and regulatory systems could provide broader insights into contextual factors influencing artificial intelligence implementation. Additionally, future research could explore the ethical dimensions of intelligent accounting systems, including algorithmic transparency, accountability mechanisms, and stakeholder trust in automated financial reporting environments.

From a practical perspective, organizations should prioritize investments in intelligent accounting infrastructures capable of real-time monitoring, anomaly detection, and predictive financial analysis. Managers and policymakers are encouraged to develop comprehensive training programs that improve accountants' and auditors' technological competencies and readiness for intelligent system adoption. Financial institutions should also establish transparent governance frameworks and ethical standards to ensure responsible use of artificial intelligence technologies

in accounting and auditing practices. Furthermore, organizations should integrate artificial intelligence gradually into existing accounting systems while simultaneously strengthening cybersecurity measures, internal controls, and regulatory compliance procedures to maximize the effectiveness and reliability of intelligent financial reporting systems.

Authors' Contributions

Authors equally contributed to this article.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

All procedures performed in this study were under the ethical standards.

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