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Continuous Auditing: AI systems that monitor transactions in real time

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Abstract

The rapid advancement of Artificial Intelligence (AI) has transformed the auditing profession by enabling continuous auditing systems capable of monitoring financial transactions in real time. Unlike traditional auditing methods, which rely on periodic reviews, AI-driven continuous auditing facilitates automated transaction analysis, anomaly detection, fraud prevention, and timely risk assessment. This study examines the role of AI in enhancing the effectiveness of continuous auditing by evaluating its impact on audit efficiency, fraud detection, internal controls, and organizational decision-making. A descriptive research design was adopted, and primary data were collected from 100 respondents, including auditors, accountants, finance professionals, and postgraduate students through a structured questionnaire. Secondary data were gathered from scholarly journals, books, industry reports, and professional publications. The collected data were analyzed using descriptive statistics, Chi-square analysis, Pearson correlation, and regression analysis. The findings reveal a significant association between AI awareness and perceptions of audit efficiency ($\chi^2 = 23.67$, $p < 0.05$). Further, a strong positive relationship exists between AI adoption and continuous auditing effectiveness ($r = 0.784$), with AI adoption explaining 61.5% of the variation in auditing effectiveness ($R^2 = 0.615$). The study concludes that AI-powered continuous auditing significantly improves the accuracy, speed, and reliability of financial transaction monitoring while strengthening fraud detection and internal controls. Despite challenges relating to implementation costs, data security, and technical expertise, AI offers substantial opportunities to enhance audit quality and support sound financial governance in the digital era.

Keywords: Artificial Intelligence, Continuous Auditing, Real-Time Monitoring, Fraud Detection, Audit Effectiveness, Digital Auditing, Financial Transactions.

Introduction

The increasing digitalization of business processes has significantly transformed financial reporting and auditing practices across organizations. Traditional auditing methods are primarily retrospective, relying on periodic examination of financial records after transactions have been completed. Although these approaches have served organizations for decades, they often fail to detect errors, irregularities, and fraudulent activities promptly, thereby limiting the effectiveness of risk management and internal control systems. The emergence of Artificial Intelligence (AI), machine learning, big data analytics, and robotic process automation has revolutionized auditing by enabling continuous auditing systems capable of monitoring transactions in real time. Continuous auditing refers to the automated collection, analysis, and evaluation of financial information as transactions occur, allowing auditors to identify anomalies, control weaknesses, and fraudulent activities almost instantaneously. AI-powered auditing systems utilize intelligent algorithms to analyze large volumes of financial data, identify unusual transaction patterns, generate alerts, and provide predictive insights that assist organizations in making informed decisions.

Modern organizations process millions of financial transactions daily through Enterprise Resource Planning (ERP) systems, cloud-based accounting platforms, and digital payment networks. Manual auditing methods are no longer sufficient to monitor these complex environments effectively. AI-driven continuous auditing enhances audit quality by improving the speed, accuracy, and consistency of transaction analysis while reducing human errors and operational costs.

Furthermore, continuous auditing strengthens internal controls, improves regulatory compliance, and enables proactive risk management by identifying potential issues before they become significant financial problems.

The adoption of AI in auditing also aligns with the growing demand for transparent corporate governance and digital transformation. Regulatory authorities and professional accounting bodies increasingly encourage organizations to leverage advanced technologies to improve audit quality and financial reporting reliability. However, despite its numerous advantages, AI-based continuous auditing faces several challenges, including high implementation costs, cybersecurity concerns, data privacy issues, algorithm transparency, and the need for skilled professionals capable of interpreting AI-generated insights.

Against this backdrop, the present study investigates the effectiveness of AI-enabled continuous auditing systems in monitoring financial transactions in real time. It examines the relationship between AI adoption and audit effectiveness while evaluating the perceptions of professionals regarding the benefits and challenges associated with AI implementation. The findings contribute to the growing body of knowledge on digital auditing and provide practical insights for organizations seeking to modernize their auditing practices through Artificial Intelligence.

Review of Literature

Artificial Intelligence has emerged as one of the most transformative technologies in modern auditing, enabling organizations to shift from traditional periodic audits to continuous, data-driven monitoring systems. Several researchers have examined the application of AI, big data analytics, and intelligent automation in enhancing audit effectiveness, fraud detection, and financial governance.

Alles (2015) examined the evolution of big data analytics within the auditing profession and argued that the increasing availability of digital financial data has fundamentally transformed audit methodologies. The study emphasized that continuous auditing enables organizations to identify financial irregularities promptly while improving transparency and audit quality. The author concluded that AI-supported analytical tools are becoming essential components of modern auditing practices.

Vasarhelyi, Kogan, and Tuttle (2015) explored the role of big data technologies in accounting and auditing. Their study highlighted that continuous auditing supported by intelligent analytical systems enables organizations to monitor financial transactions in real time, thereby strengthening internal controls and enhancing decision-making. The researchers emphasized that AI facilitates

predictive analysis, automated exception reporting, and continuous assurance, significantly improving audit effectiveness.

Appelbaum, Kogan, and Vasarhelyi (2017) investigated the integration of big data analytics into audit engagements and identified several research opportunities in AI-enabled auditing. The authors argued that AI technologies significantly improve fraud detection, risk assessment, and audit efficiency by processing large volumes of structured and unstructured financial data. However, they also noted that challenges related to data governance, model transparency, and auditor competencies require further attention.

Rai (2020) discussed the growing importance of Explainable Artificial Intelligence (XAI) in business decision-making. The study emphasized that although AI systems demonstrate superior analytical capabilities, stakeholders are more likely to trust AI-generated recommendations when the decision-making process is transparent and interpretable. The author concluded that explainable AI is essential for improving user confidence and supporting responsible AI adoption in auditing and financial management.

Hall (2022) highlighted the integration of Artificial Intelligence within Accounting Information Systems and emphasized its ability to automate transaction processing, detect anomalies, and strengthen internal controls. The study suggested that AI-based systems significantly reduce manual effort while improving the accuracy and reliability of financial reporting.

The International Auditing and Assurance Standards Board (IAASB, 2022) recognized the growing importance of advanced technologies in auditing through its updated auditing and quality management standards. The standards encourage auditors to incorporate technology-assisted audit procedures that enhance risk identification, evidence collection, and continuous monitoring while maintaining professional judgment and audit quality.

The International Federation of Accountants (IFAC, 2023) reported that Artificial Intelligence is reshaping the future of the accounting profession by improving operational efficiency, predictive analytics, and continuous assurance. The report emphasized that accountants and auditors must develop digital competencies to effectively utilize AI technologies while addressing ethical, regulatory, and cybersecurity concerns.

Deloitte (2023) highlighted that AI-powered continuous auditing enables organizations to automate routine audit procedures, monitor financial transactions in real time, and improve fraud detection capabilities. The report concluded that AI significantly enhances audit efficiency by reducing processing time, increasing analytical

accuracy, and enabling auditors to focus on high-value strategic activities.

Objectives

1. To study the concept of continuous auditing and the responsibility of Artificial Intelligence (AI) in monitoring financial transactions in real time.
2. To examine how AI-based continuous auditing systems improve the accuracy, efficiency, and speed of detecting errors and fraudulent transactions.
3. To analyze the benefits and challenges of implementing AI-driven continuous auditing in organizations.
4. To evaluate the impact of AI-enabled continuous auditing on internal controls, risk management, and decision-making in modern businesses.

Research Methodology

The study titled "Continuous Auditing: AI Systems that Monitor Transactions in Real Time" adopts a **descriptive research design** to examine the role of Artificial Intelligence (AI) in continuous auditing and its effectiveness in monitoring financial transactions in real time. The research aims to understand the perceptions, benefits, and challenges associated with AI-enabled continuous auditing systems.

The study is based on a **sample of 100 respondents**, comprising auditors, accountants, finance professionals, and postgraduate students with knowledge of auditing and AI technologies. A **convenience sampling** technique is employed to select respondents based on their accessibility and willingness to participate, making data collection both practical and cost-effective.

Both **primary and secondary data** are utilized in the study. Primary data are collected through a structured questionnaire, while secondary data are obtained from research journals, books, company reports, government publications, and credible online sources related to AI and continuous auditing.

The collected data are analyzed using **descriptive statistical techniques**, including frequency distributions, percentage analysis, and graphical representations such as bar charts and pie charts, to summarize and interpret the responses effectively.

The research focuses on respondents from organizations, educational institutions, and the auditing profession who possess knowledge of AI applications in auditing. The study is conducted over a period of **two to three months**, encompassing data collection, analysis, and interpretation.

Limitations of the Study

- The study is limited to **100 respondents**.
- Responses are based on the opinions and awareness of the participants.
- Time and resource constraints may limit the scope of the research.
- Findings may not represent all industries or organizations using AI-based continuous auditing.

Hypothesis

H₀₁ (Null Hypothesis): There is no significant relationship between the use of AI

H₀₂ (Null Hypothesis): AI-based continuous auditing does not significantly improve the detection of fraudulent or suspicious transactions.

H₀₃ (Null Hypothesis): AI systems have no significant impact on the efficiency and accuracy of real-time transaction monitoring.

Table 1. Respondents' Awareness of Artificial Intelligence and Perception of Audit Efficiency

Awareness of AI	Agree	Disagree	Total
Aware	58	12	70
Not Aware	10	20	30
Total	68	32	100

Table 2. Percentage Distribution of Respondents' Awareness of AI

Awareness of AI	Agree	Disagree
Aware	47.6	22.4
Not Aware	20.4	9.6

Table 3. Chi-Square Test for Association between AI Awareness and Audit Efficiency

Cell	(O-E) ² /E
Aware-Agree	2.27
Aware-Disagree	4.83
Not Aware-Agree	5.30
Not Aware-Disagree	11.27
χ² Calculated	23.67

Interpretation

The calculated Chi-square value ($\chi^2 = 23.67$) indicates a statistically significant association between respondents' awareness of Artificial Intelligence and their perception that AI improves audit efficiency. Since the calculated value exceeds the critical value at the 5% significance level, the null hypothesis is rejected. This finding suggests that respondents with greater awareness of AI are more likely to perceive AI-enabled continuous auditing as effective.

Table 4. Pearson Correlation between AI Adoption and Continuous Auditing Effectiveness

Variable	AI Adoption	Audit Effectiveness
AI Adoption	1.000	0.784
Audit Effectiveness	0.784	1.000

Interpretation

The Pearson correlation coefficient ($r = 0.784$, $p < 0.001$) indicates a strong positive relationship between AI adoption and continuous auditing effectiveness. The result implies that increased adoption of AI technologies is associated with significant improvements in real-time auditing performance

Table 5. Model Summary of Regression Analysis

Statistic	Value
R	0.784
R ²	0.615
Adjusted R ²	0.611
Standard Error	0.472

The regression model demonstrates a strong relationship between AI adoption and continuous auditing effectiveness ($R = 0.784$). The coefficient of determination ($R^2 = 0.615$) indicates that 61.5% of the variation in continuous auditing effectiveness is explained by AI adoption, while the remaining variation is attributed to other influencing factors.

Table 6. ANOVA Results for Regression Model

Source	SS	df	MS	F	Sig.
Regression	34.92	1	34.92	156.78	0.000
Residual	21.83	98	0.223		
Total	56.75	99			

Interpretation

Since the p -value = **0.000** (<0.05), the regression model is statistically significant.

Table 7. Regression Coefficients for AI Adoption and Continuous Auditing Effectiveness

Variable	B	Std. Error	Beta	t	Sig.
Constant	1.284	0.243		5.28	0.000
AI Adoption	0.712	0.057	0.784	12.52	0.000

Interpretation

The regression coefficient ($B = 0.712$) indicates that a one-unit increase in AI adoption leads to a **0.712-unit increase** in continuous auditing effectiveness. The standardized beta coefficient ($\beta = 0.784$) further confirms a strong positive influence. Since the significance value is $p < 0.001$, the effect of AI adoption on continuous auditing effectiveness is statistically significant.

Overall Findings

- **Chi-Square Test:** There is a significant association between AI awareness and perceptions of audit efficiency ($\chi^2 = 23.67$, $p < 0.05$).

- **Correlation Analysis:** AI adoption has a **strong positive correlation** with continuous auditing effectiveness ($r = 0.784$).
- **Regression Analysis:** AI adoption significantly predicts continuous auditing effectiveness, explaining **61.5%** of its variation ($R^2 = 0.615$, $p < 0.05$).

Suggestions

1. **Increase AI adoption in auditing:** Organizations should invest in AI-powered continuous auditing systems to improve the speed, accuracy, and reliability of real-time transaction monitoring.
2. **Provide regular employee training:** Auditors and finance professionals should receive continuous training on AI tools, data analytics,

and emerging auditing technologies to enhance their skills and effectiveness.

3. **Strengthen data security and privacy:** Organizations should implement robust cybersecurity measures, data encryption, and access controls to protect sensitive financial information processed by AI systems.
4. **Integrate AI with existing audit systems:** Businesses should ensure that AI-based auditing solutions are integrated with their current accounting and enterprise resource planning (ERP) systems for seamless monitoring and reporting.
5. **Develop clear regulatory and ethical guidelines:** Regulatory authorities and organizations should establish policies and ethical standards to ensure the responsible, transparent, and fair use of AI in continuous auditing.

Conclusion

The study concludes that Artificial Intelligence has significantly transformed the field of continuous auditing by enabling real-time monitoring of financial transactions, improving audit efficiency, and enhancing fraud detection capabilities. The findings indicate that AI-based continuous auditing contributes to greater accuracy, faster decision-making, stronger internal controls, and effective risk management. Statistical analyses, including the Chi-square test, correlation, and regression analysis, reveal a significant positive relationship between AI adoption and the effectiveness of continuous auditing. Although challenges such as implementation costs, data privacy concerns, and the need for skilled professionals remain, the overall benefits of AI outweigh these limitations. Therefore, organizations are encouraged to adopt AI-driven continuous auditing systems to improve audit quality, ensure regulatory compliance, and support better financial governance in the digital era.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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