Impact of AI-Driven Data Analytics on Fraud Detection Effectiveness in Forensic Accounting: A Study of Selected Firms

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Abstract
The rapid digitalization of financial systems has significantly increased the complexity and volume of financial data, making traditional fraud detection techniques insufficient. Artificial Intelligence (AI)-driven data analytics has emerged as a powerful tool in forensic accounting, enhancing fraud detection accuracy, speed, and predictive capabilities. This study examines the impact of AI-driven data analytics on fraud detection effectiveness in selected firms. Using primary data collected from accounting and audit professionals and secondary data from published reports, the study analyzes improvements in detection accuracy, reduction in investigation time, and prevention of financial fraud. The findings indicate that AI-based forensic tools significantly improve fraud detection effectiveness and contribute to proactive fraud prevention.

Keywords: AI, Data Analytics, Forensic Accounting, Fraud Detection, Financial Crime

1. Introduction

Artificial Intelligence has made a significant impact in the world of finance and accounting. AI enabled finance and accounting systems are the way for enterprises to stay strong contenders in an increasingly competitive market because they save time and provide deep insights. In order to identify, look into, and stop financial misconduct, forensic accounting is essential. Fraud schemes have grown increasingly complex as digital transactions, big data, and automated accounting systems have expanded. AI-driven data analytics combines anomaly detection, machine learning, and predictive modelling to spot anomalous financial trends instantly. The purpose of this study is to evaluate how AI-based analytics improve the efficacy of fraud detection in particular companies.

2. Review of Literature

Digital Literacy and Commerce A study on digital literacy's impact on mobile commerce (m-commerce) adoption in India indicates that higher digital literacy correlates with increased usage of digital marketplaces and services, driving commerce growth. This research highlights how digital skills affect consumer confidence and participation in digital markets. Cybersecurity Awareness and Economic Activity Research shows that cybersecurity awareness is critical not only to protect individual users but also to sustain business operations. When users lack awareness of cyber risks, commercial transactions become riskier, leading to fraud losses that affect the broader economy.

3. Objectives of the Study

1. To evaluate how forensic accounting uses AI-driven data analytics in selected firms.
2. To assess how it affects the efficacy of fraud detection in selected firms.
3. To contrast AI-based and conventional fraud detection techniques.
4. To offer conclusions and recommendations to businesses and decision-makers.

4. Research Methodology

4.1 Research Design

Descriptive and analytical research design.

4.2 Sample Selection

- Selected Firms: 10 small and medium firms represent manufacturing, services, IT, and financial support sectors firms selected for the study.

4.3 Data Collection

- **Secondary Data:** Journals, reports, professional publications

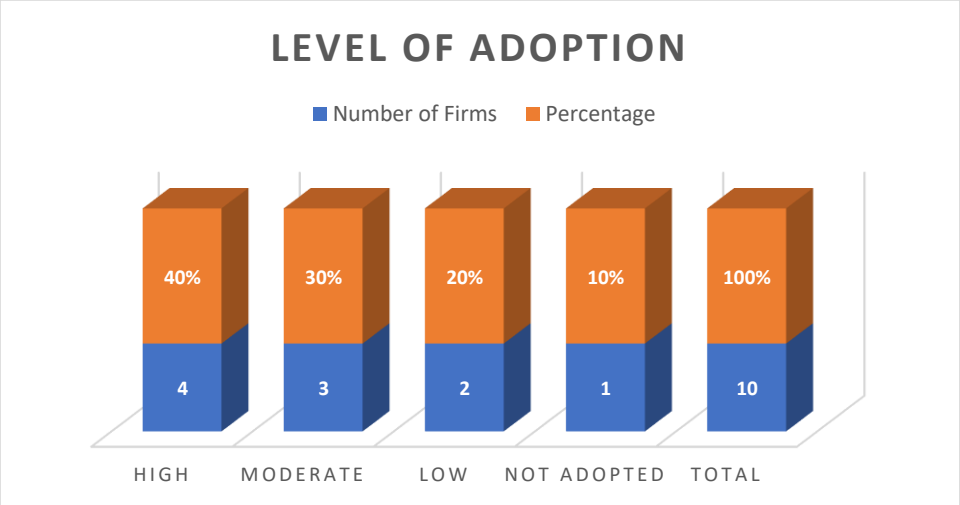
4.4 Tools Used

Percentage analysis and comparative analysis.

5. Data Analysis and Interpretation

Table 1: Adoption Level of AI-Driven Analytics in Firms

Level of Adoption	Number of Firms	Percentage
High	4	40%
Moderate	3	30%
Low	2	20%
Not Adopted	1	10%
Total	**10**	**100%**



Interpretation:

As per table No. 1, 4 out of 10 firms (40%) fall under the high adoption category. This indicates that a significant proportion of firms have strongly embraced the concerned practice/technology, reflecting readiness and maturity in adoption.3 firms (30%) show moderate adoption. These firms have partially adopted the practice but may still be in the transition phase, requiring further support, training, or resources to reach full adoption.2 firms (20%) are at a low adoption level, suggesting limited use or early-stage implementation. This group reflects hesitation, constraints, or lack of awareness.1 firm (10%) has not adopted the practice at all, highlighting resistance, structural barriers, or lack of perceived relevance. Out of the total 10 firms, 70% (High + Moderate) have adopted the practice to a reasonable extent, indicating a generally positive adoption trend. However, 30% (Low + Not Adopted) still lag behind, pointing to the need for targeted interventions such as awareness programs, technical support, or policy incentives.

Table 2: Comparison of Fraud Detection Effectiveness

Criteria	Traditional Methods	AI-Driven Analytics
Detection Accuracy	Medium	High
Time Required	High	Low
Predictive Capability	Low	High
Handling Large Data Volumes	Limited	Excellent
Error Rate	Higher	Lower

As per table No. 2 the comparison between traditional methods and AI-driven analytics highlights a clear shift in effectiveness and efficiency. Traditional methods demonstrate medium detection accuracy, require a high amount of time, and offer low predictive capability, making them less suitable for proactive analysis. Their ability to handle large data volumes is limited, and they are more prone to

higher error rates, especially in complex or data-intensive environments. In contrast, AI-driven analytics provide high detection accuracy while requiring significantly less time to process information. They possess strong predictive capabilities, enabling early identification of potential issues, and can efficiently manage large volumes of data with ease. Additionally, AI-based approaches exhibit a lower error rate, enhancing reliability and decision-making quality. Overall, the paragraph indicates that AI-driven analytics significantly outperform traditional methods across all key evaluation criteria.

Table 3: Impact of AI on Fraud Detection Outcomes

Impact Area	Respondents Agreeing (%)
Improved Accuracy	88%
Faster Fraud Identification	84%
Reduction in Financial Losses	76%
Enhanced Compliance	82%
Better Risk Assessment	90%

The responses indicate a strong positive impact across all evaluated areas. A large majority of respondents (88%) agreed that the use of advanced analytical approaches has led to improved accuracy in operations. Similarly, 84% of respondents observed faster fraud identification, highlighting increased efficiency in detecting irregularities. Reduction in financial losses was acknowledged by 76% of respondents, suggesting a tangible economic benefit, though slightly lower compared to other areas. Furthermore, 82% agreed that these approaches have enhanced compliance, reflecting better adherence to regulatory and reporting standards. Notably, the highest level of agreement (90%) was recorded for better risk assessment, indicating that respondents perceive significant improvement in identifying and managing potential risks. Overall, the findings demonstrate a substantial and favourable impact across accuracy, speed, compliance, financial protection, and risk management.

6. Findings of the Study

1. The use of AI-driven data analytics substantially enhances the accuracy of fraud detection compared to conventional approaches.
2. Organizations adopting AI-based tools are able to identify fraudulent activities more quickly than those relying on traditional methods.
3. Predictive analytics plays a crucial role in anticipating potential fraud risks before they actually occur, enabling proactive prevention.
4. The integration of AI in forensic investigations significantly reduces manual effort and minimizes human errors, improving overall efficiency.
5. Despite its advantages, the high cost of implementation continues to be a major barrier for small firms in adopting AI-based solutions.

7. Suggestions

1. Firms should gradually integrate AI-based forensic tools alongside traditional audits.
2. Training programs should be conducted for forensic accountants in AI and analytics.
3. Policymakers should issue guidelines for ethical use of AI in forensic accounting.
4. Small and medium firms may adopt **cloud-based AI solutions** to reduce costs.
5. Continuous monitoring systems should replace periodic fraud audits.

8. Conclusion

AI-driven data analytics has transformed forensic accounting from a reactive to a proactive discipline. The study concludes that AI significantly enhances fraud detection effectiveness by improving accuracy, speed, and predictive capabilities. Although challenges such as cost and skill gaps exist, the long-term benefits balance the limitations. The adoption of AI in forensic accounting is no longer optional but essential for combating modern financial fraud.

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