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Is Artificial Intelligence an Efficient Technology for Financial Fraud Risk Management?

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Abstract: *Organizations and individuals reported increased cases of fraud during the Covid-19 pandemic. Financial distress prompted some people to turn to fraud to earn a livelihood. Financial fraud has negatively impacted individuals, governments, businesses, and other institutions. Previous regulatory measures at the international, national, local, and individual level have failed to adequately contain financial fraud. Therefore, many institutions have resorted to using Artificial Intelligence for detecting fraud. However, AI is still an advancing technology at its early stages. Therefore, AI developers must address some of its downsides. The paper sought to determine whether AI is an efficient technology for financial fraud risk management. The study used an integrative literature review, exploring previous empirical and theoretical literature to determine whether AI is an efficient technology in curbing financial fraud. The researcher used secondary data methodology to fulfil the study objectives, comprehensively collecting data from peer-reviewed journals from scholarly websites like scholar.google.com, researchgate.net, proquest.com, papers.ssrn.com, link.springer.com, pubmed.ncbi.nlm.nih.gov, sciencedirect.com, emerald.com, and others. The study found out that AI has not yet attained efficiency regarding financial fraud risk management. The tool is still highly reliant on human intervention. It is prone to human bias and unable to handle non-routine emergency risk environments. AI developers should address the current and potential concerns for the technology to attain efficiency in managing financial fraud risk.*

Keywords: *Artificial Intelligence (AI), fraud, risk, management, data, fraud detection, financial fraud, Covid-19*

1. INTRODUCTION

Fraudulent activities have caused the loss of about 6 percent of the global Gross Domestic Product within the last 20 years. As of 2023, corporations had reported cyber breach-related damages amounting to approximately 6 percent of their net revenue. Globally, organizations recorded digital fraud of more than $340 billion between 2023 and 2027 (Tan, 2023). The 2022 Economic Crime and Fraud Survey found that cybercrime is the second most common form of corporate risk after customer fraud. In 2022, PricewaterhouseCoopers recorded a 46 percent impact of fraud on all businesses globally. During the Covid-19 pandemic, many employees shifted from the office environment to remote work, which enhanced data access. The Federal Trade Commission recorded about $5.7 billion in fraud in 2021, a 70 percent increase from 2020.

The financial services sector has significantly faced the consequences of fraud. Financial fraud increased following the Covid-19 pandemic and the Russia-Ukraine war (Halteh & Tiwari, 2023). Factors such as financial distress have prompted people to turn to financial crime as a source of livelihood. Businesses that rely on financial services as an intermediary transaction method have direly suffered from financial fraud. In 2021, national agencies like the Federal Trade Commission and the Consumer Financial Protection Bureau received 994,000 fraud complaints in the United States alone. The federal agencies recorded $2.8 million in fraud complaints in the same year. National, regional, and organizational regulatory efforts have been inadequate to contain financial fraud.

To curb such fraud, Artificial Intelligence (AI) technology has intensively and extensively analyzed data to detect anomaly patterns, including phishing threats, identity theft, and payment fraud. AI can also learn new trends, such as fraud patterns, a developing feature. Fraud audits require repetitive investigative processes to identify errors and material misstatements, traditionally conducted entirely

by human judgment and actions. However, AI proponents disregard traditional audit standards for being inefficient. In 2016, KPMG International Limited established that about 58 percent of chief executive officers considered AI a tool that would significantly improve audit efficiency. Since fraud is detrimental to public, private, and government entities, AI applications in auditing organizations could become mandatory. AI has numerous advantages and disadvantages in organizational risk management. AI helps improve efficiency, accuracy, and cost-saving in managing fraud risks. However, the system could also exhibit downsides, such as ethical concerns, that could render its capacity to solve fraud risks inefficient.

2. Materials and Methods

To get a comprehensive view of the efficiency of AI in financial fraud risk management, the study utilized an integrative literature review, exploring previous empirical and theoretical literature. The researcher used secondary data methodology to fulfil the study objectives, comprehensively collecting data from peer-reviewed journals from scholarly websites like scholar.google.com, researchgate.net, proquest.com, papers.ssrn.com, link.springer.com, pubmed.ncbi.nlm.nih.gov, sciencedirect.com, emerald.com, and others. The researcher highlighted a set of keywords and searched for them on scholarly websites to attain maximum results. The researcher ascertained that the study covered the latest AI trends in financial fraud risk management by relying on scholarly papers under four years old. The study then analyzed various researchers' discussions, findings, and conclusions regarding AI and financial fraud risk management, exploring their strengths, gaps and limitations before deriving its findings and conclusion.

3. Literature Review

Bao, Hilary, and Ke (2022) note that AI employs advanced machine learning in fraud detection. Machine learning is a blend of AI algorithms informed by an entity's historical data to recommend risk rules. The entity then incorporates such risk rules to deter or enable particular user actions, for instance, fraudulent transactions, suspicious logins, and identity theft. In fraud detection and risk management, AI enables faster detection, enhancing the speed of detecting suspicious patterns, unlike the slower human process. AI also minimizes time wastage in manual review since machines analyze the data. It also enhances the large dataset prediction as AI uses machine learning to learn data and patterns that would be challenging for humans to memorize (Bao et al., 2022). AI is a cost-effective method for fraud detection and risk management because it reduces the cost of hiring risk managers since machine learning analyses and produces preliminary reports on all the input information.

On the other hand, unlike humans, AI is not prone to fatigue, sealing loopholes that fraudsters might exploit to penetrate the system during non-working hours. According to Baker (2019), AI can utilize algorithms and past card-holder information in the banking industry to design fraud-detection models in real-time. Instead of flagging non-fraudulent and fraudulent transactions, AI assigns each transaction fraud probability. As such, transactions exceeding particular risk thresholds are declined at the point of sale. AI aims at problem recognition and resolution devoid of rigid rules.

According to Ikhsan et al. (2022), data analytics fraud detection models have a high accuracy rate in enhancing audit quality. The authors observe that Indonesia was among the top four nations with the largest fraud incidents in 2022, among others like Malaysia, China, and Australia. However, Ikhsan et al. (2022) note that data analytics is highly effective in fraud detection if combined with other auditing methods as a complement. For instance, combining the Beneish-M Score with logistic regression data mining methods leads to more comprehensive fraud detection than using either independently. Such a combination model can derive 77 percent accuracy in fraud detection. Ikhsan et al. (2022) also observe that big data analytics and AI can minimize audit delay probability as the compilation reveals fraud in real time.

AI uses algorithms to manage financial fraud risk in financial service institutions by applying complex and large data sets to scale and pinpoint patterns and predict potential outcomes. The tool helps mitigate risks by detecting fraud-related activities (Meitasari & Audrey, 2023). AI has helped manage fraud risk in the banking system by enhancing cost-saving and operational efficiency. Automated monitoring and processing help improve compliance and system controls. Process automation has also minimized human errors. Additionally, advanced data analytics has enabled better credit score accuracy. Through intelligent document automation, AI has improved customer

processing time and related accuracy concerning payslips, bank statements, and transactions. However, AI poses a challenge with macro regulations regarding the total financial system stability (Danielsson, Macrae & Uthemann, 2022). During an emergency, institutions are likely to break pre-existing regulations. Similarly, there is scarce data, and historical information could become unreliable. Notably, unknown risks can become conspicuous in emergency environments. AI must comprehend causality to become efficient in such a scenario, reason beyond the local capacity, and find non-inherent threats. The current AI technology does not have such capabilities yet.

Using AI reduced business risks for Small and Medium Enterprises during Covid-19 (Drydakis, 2022). The leveraged technology enabled SMEs to attain new demand formulas and enhance operational adequacy, minimizing risks. AI can reveal price anomalies, including pricing errors, helping to raise audit queries regarding fraud and error risk management. AI can detect remote and denial-of-service attacks in cybersecurity, helping the firm make real-time decisions. Zhu et al. (2021) observe that although data-oriented models have aided in fraud detection, multiple challenges remain to ensure a viable AI future (Zhu et al., 2021). For instance, complex fraud events deter accurate detection. In tandem with Zhu et al. (2022), Rikhardsson et al. (2022) note that AI still requires significant correction regarding its application in SMEs. Rikhardsson et al. (2022) found that AI developers focus on big data but disregard small data, although most global entities are SMEs that rely on small data. SMEs constitute 90 percent of all global firms (Rikhardson et al., 2022). As such, they attribute to a large part of fraud risk management. AI and auditing research has inherently focused on large firms and big data. Notably, AI depends on training machine learning algorithms like rule learning or deep neural networks. AI systems require massive data amounts for such training to pinpoint correct or incorrect transactions, an irrelevant and unaffordable process for small data SMEs.

Munoko, Brown-Liburd, and Vasarhelyi (2020) urge researchers to explore beyond the inherently-discussed AI benefits and investigate the technology's ethical implications. For instance, AI is vulnerable to systemic, statistical, computational, and human biases, factors that challenge AI implementation in audit risk management. For example, AI detects fraudulent transactions. The system uses pre-populated human-generated data to predict (Uglum, 2021). Such pre-populated data could exhibit human bias or error.

Fedyk et al. (2022) observe that AI aims to improve audit efficiency and quality, including fraud detection. The authors interviewed 17 audit agents for the eight biggest public accounting entities in the United States of America, finding out that although AI significantly achieves its aim of enhancing audit quality and efficiency, it also affects employment. AI decreases audit fees and the probability of audit restatement. On the other hand, like other previous technologies, AI is likely to eliminate accountants from their jobs in the future. Contrary to Fedyk et al. (2022), Joshi (2021) concludes that AI will take up routine audit and accounting jobs. Joshi (2021) notes that AI will enhance audit and accounting accuracy, improving audit evidence collection before pointing out that accounting and audit professionals disagree that AI could replace their jobs. Instead, AI requires human intelligence during strategic thinking, data analysis, and consultation. However, Joshi (2021) notes that with AI advancement, accountants and auditors must enhance their fundamental data know-how and system automation skills as auditors highly focus on the critical components of AI outputs. Dotel (2020) also observes that AI has disrupted many sectors, calling for significant audit changes. He identifies some AI areas in auditing as Robotic Process Automation (RPA), Search Optimization Tools, Natural Language Processing, Artificial Neural Networks, and Information Extraction and Data Mining. The author considers AI a complement tool for humans in an audit. AI comprehensiveness is only achievable with the automation of audit entries and information. According to Dotel (2020), AI can indicate risk, but human auditors must also investigate causes, effects, and actual conditions, making it a complementary technology in an audit.

4. Results and Discussion

4.1. AI and Fraud Risk Detection

The Covid-19 pandemic increased access to data as more people interacted digitally, for instance, remote-working employees. Therefore, there has been a massive increase in fraud cases since the pandemic. The scenario prompted many organizations to enhance their usage of artificial intelligence in fraud risk management, crucially revealing the strengths and weaknesses of the technology in a

larger platform. AI is useful for Small and Medium Enterprises (SMEs), the largest proportion of global businesses. For instance, AI can reveal price anomalies, including pricing errors, helping to raise audit queries regarding fraud and error risk management.

AI uses advanced machine learning to detect fraud. For instance, AI integrates multiple algorithms trained using the entity's historical data to recommend risk regulations. Users then incorporate such rules to deter or allow actions like logins and transactions. Most businesses employ professionals to assist with incorporating input information, generating, reviewing, and activating the rules, training the algorithms, and testing the derived rules on historical data. Managing multiple transactions can lead to human-generated error or delay. However, AI analyses such details quickly and eliminates human error. The technology also eliminates non-working system idle time since it operates on a 24-hour basis without fatigue. The study observes that AI has helped organizations detect fraud.

4.2. AI as a Complementary Tool in Risk Management

Many studies focus on AI benefits but disregard its demerits. AI has numerous disadvantages that call for correction as technology advances. Although AI improves audit accuracy and efficiency, enhancing fraud detection, it is only a complementary tool to human capacity. AI is only significantly effective if combined with other audit methods. For instance, integrating the Beneish-M Score with logistic regression data mining techniques leads to more comprehensive fraud detection than using either independently. On the other hand, neural networks depend on machine learning, and developers must rely on expert risk management information to input data into the systems. To this end, AI efficiency still largely relies on traditional fraud risk management methods.

4.3. Will AI Replace Risk Management Personnel?

Risk management personnel include managers, auditors, and other risk management officers. AI has helped manage fraud risk in the banking system by enhancing cost-saving and operational efficiency. AI has helped improve accuracy and reduced fraud risk management delays such as audit time in the financial services sector. It has eased the work of risk management personnel by handling routine work. AI has also helped many institutions reduce fraud risk management costs by automating the process and eliminating the need for hiring numerous audit personnel. As such, stakeholders have expressed concern that AI could replace auditors and other risk management staff. However, considering the ever-changing financial risk environment, AI will likely continue relying on audit expertise regarding input data and other non-routine processes. The technology would also need human operators. It is impractical for AI to completely replace humans in managing financial risks.

4.4. AI and Ethics

Research papers should highlight the implication of AI in ethics during fraud risk management. AI relies on human-generated input. Therefore, it is prone to human error and bias. For example, systematic bias defines subjective rules favorable to particular environments or organizations. AI developers must focus on eliminating bias. If AI aims at improving risk management efficiency, it should not be the same tool that generates new risks.

Second, considering that many businesses operate in the international environment, AI regulations do not apply evenly to all stakeholders, generating systemic bias. Similarly, such regulations may not favor all demographic divergences in the same environment. On the other hand, AI could depict statistical bias when the sample fails to represent the entire population, as found in development algorithms. AI could also exhibit human bias, including behavioral and interpretation bias. As financial services continue to rely on AI for risk management, the system calls for massive development to attain full efficiency in fraud detection.

4.5. Emergency Situations

The paper establishes that the Covid-19 environment enhanced fraud risk in organizations. Emergency environments provide exceptional circumstances that routine risk management is incapable of handling. New risks emerge during emergencies. Additionally, such environments can call for new solutions to uncertain risks. However, AI Depends on machine learning which derives information from historical data. In risk emergency environments, AI must comprehend causality to become efficient, reason beyond the local capacity, and find non-inherent threats, capabilities that AI Technology currently lack.

4.6. AI and Small Data: The Case of SMEs

Most businesses globally are SMEs. Therefore, SMEs constitute a significant need for risk management. However, AI research on business risk management has overly focused on big data and multinational entities, disregarding SMEs and small data. According to Richardson et al. (2022), AI depends on training machine learning algorithms like rule-learning or deep neural networks. AI systems require massive data amounts for such training to pinpoint correct or incorrect transactions, an irrelevant and unaffordable process for small data SMEs. Going forwards, AI developers should be keen on incorporating SMEs' risk management needs in AI development due to the vulnerability of such enterprises to financial risks.

5. CONCLUSION

The paper establishes that AI is a significantly efficient tool regarding fraud risk management. In fraud risk management, AI is not a substitute but a complement to human input. Researchers have often discussed the benefits of AI in multiple areas, including fraud risk management. For instance, AI uses algorithms to learn and detect fraud patterns for risk management. However, a major weakness of AI is that it is vulnerable to bias since it uses human-generated data. As a system that aims to eliminate human error and bias, it would be inefficient for such a technology to duplicate the same risks in organizational systems. The downsides discussed in this paper are among the few barriers deterring AI from attaining full efficiency in fraud risk management. AI developers must incorporate AI into all organizational systems, including SMEs which constitute the largest proportion of business enterprises. AI should be capable of handling new, non-routine risks resulting from emergencies in risk environments like Covid-19. Although researchers have explored the possibility of AI replacing auditors and other risk management personnel, AI developers are yet to adequately address the concern, a case that further deteriorates AI efficiency.

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