Chapter 11
Role of Artificial Intelligence and Machine Learning Algorithms in Detecting Financial Frauds

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ABSTRACT

The integration of artificial intelligence (AI) and machine learning (ML) algorithms to detect fraud in financial transactions has entirely changed the field. Reconfiguration of financial product value chains necessitates the implementation of strong cybersecurity measures and advanced encryption techniques to protect sensitive financial data.. This chapter provides an insight into how AI and ML work as effective tools to deal with financial crimes, describing how they help improve fraud-detection capacities. AI and ML algorithms analyze financial data and make it possible for banks to prevent or mitigate issues such as risks. In addition, the study discusses the difficulties involved in applying AI and ML within the finance industry. Lastly, this study highlights the potential transformation that AI and ML can bring by strengthening the resilience of the financial ecosystem against evolving threats of fraud. According to this study, to effectively detect fraud, the financial and development supervisory agency must leverage more technology, particularly data analytics and AI.

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INTRODUCTION

Financial fraud is a wide term and has many possible interpretations. For our purposes, it may be defined as the deliberate employment of unlawful techniques or procedures to acquire financial benefits (Zhou & Kapoor, 2011). Financial fraud is a fraudulent activity that takes advantage of investors, typically through exaggerated returns and inaccurate product descriptions (Gui et al., 2024). It is a complicated, multifaceted economic phenomenon with psychological underpinnings, typically motivated by the need for quick money and aggravated by an inadequate legal system (Karpoff, 2021). Accounting fraud is a type of financial fraud that includes misusing cash, inflating revenues, and engaging in other dishonest accounting activities (Yu & Rha, 2021). Fraud has an immense negative impact on society and business, and credit card fraud alone results in billions of dollars of lost income annually. Financial fraud has larger implications for the business community, such as supplying funds for unlawful operations, including drug trafficking and organized crime (Bhattacharyya et al., 2011). Financial fraud, a complex and varied economic phenomenon, is defined as fraudulent behaviours designed to defraud investors (Gui et al., 2024). It is pervasive in a variety of industries, including banking, where it is frequently committed through payment card fraud. Following the 2008 financial crisis, global financial centres and financial institutions explored other business growth avenues to maintain their sector, as the cost of operations escalated due to additional regulatory measures. Using cutting-edge Internet and information technology to improve the way in which financial services are delivered is one of their most recent endeavours (Fintech). The development of non-cash payments and internet transactions has raised the chances of fraud (Sood & Bhushan, 2020). There are great expectations that artificial intelligence and machine learning, in particular as a solution for safe IT and data protection, will lead to the creation of novel financial goods and services, as well as possible increases in the financial services sector's operational efficiency (Zhu & Zhou, 2016).

Artificial Intelligence

AI refers to the science of artificial intelligence. It employs computers to imitate human intelligent behaviours and educates computers to learn human skills, including learning, judgment, and decision-making (Zhang & Lu, 2021). AI is the capacity of machines to accomplish activities that normally require human intelligence, such as thinking, learning, and problem solving (Hassani et al., 2020). It is a vast multidisciplinary area with several modules, including knowledge representation, problem-solving, and natural language processing. AI has the ability to significantly improve productivity in different areas and is always improving, requiring new