Chapter 13
Integrating AI and Blockchain for Cybersecurity Insurance in Risk Management for Predictive Analytics in Insurance

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ABSTRACT

Expanding more intelligent, secure, and open insurance structures has become necessary in response to the growing frequency and sophistication of cyber attacks. This chapter proposes an innovative multi-layer structure combining Artificial Intelligence (AI) and Blockchain technology to strengthen cybersecurity insurance systems. The proposed architecture includes anomaly scoring, real-time risk assessment, and

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claim processing based on smart contracts for automating insurance decisions. A comparison of proposed model's performance against baseline and conventional models shows better metrics: accuracy (96.4%), precision (95.2%), recall (94.7%), and F1 score (94.9%), with the best trust/audibility score (9.5/10). The model's capacity to deliver a trustworthy, verifiable, and advanced cyber insurance process justifies the compromise, even though the response time (142 milliseconds) is slightly higher than that of more basic models. This paper describes a novel approach to combining artificial intelligence and blockchain technology in predictive cybersecurity insurance systems.

1. INTRODUCTION

The advent of digital transformation in the entire insurance sector has affected the cybersecurity field. This transformation has brought with it the realization of both vast potential and challenging issues related to the industry. To support decision-making, insurance companies are increasingly reliant on data-driven technologies. This reliance is anticipated to keep growing. Therefore, the number of digital assets susceptible to cyber-attacks is also rising, and the sensitivity level of these assets is also rising (Adil et al., 2023). In the current scenario, the conventional risk mitigation strategies are insufficient to cater to the needs. The application of emerging technologies like Blockchain and artificial intelligence (AI) in cybersecurity risk management can redefine how insurers approach solving the issue. The capacity to process massive quantities of information, the identification of patterns, and make judgements based on these discoveries are all strong capabilities that artificial intelligence (Alabdulatif et al., 2022) makes available. According to Alzoubi et al. (2022), applying artificial intelligence to insurance operations would probably lead to better risk profiles, detection of abnormality in customer behaviour claims, and automation of underwriting processes.

On the other hand, Blockchain provides a distributed and unchangeable record that safeguards data integrity and establishes trust among a wide range of stakeholders via smart contracts and transactions accessible to the public. Combining blockchain technology with artificial intelligence ultimately results in an ecosystem mutually supportive of one another. Blockchain technology is accountable for trust, data security, and data verifiability (Sinha et al., 2019). Even though artificial intelligence is accountable for intelligent judgments, blockchain technology is accountable for the same. When it comes to cybersecurity insurance, where the precision of predictions and genuineness of data are most critical, the importance of this synergy cannot be emphasized more concerning its worth. Another issue is that the insurance industry increasingly depends on digital interactions, including various tasks ranging from

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