

# Artificial Intelligence as a Catalyst for Innovation in Finance and FinTech Ecosystems: A Strategic and Empirical Perspective

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## ABSTRACT

Artificial intelligence has become indispensable in today's financial world, fundamentally reshaping how financial firms develop their operations, handle risks, secure their systems, and engage with clients. This paper offers a systematic overview of AI's integration into financial services, assessing its practical applications, strategic benefits, and inherent limitations across key FinTech areas like digital payments, credit assessment, investment management, insurance, regulatory technology, and blockchain finance. Drawing on academic research and practical examples from 2020 to 2025, this study explores how sophisticated computational methods, such as various machine learning algorithms, deep learning networks, natural language processing, generative AI, and explainable AI, are employed in areas like detecting financial fraud, assessing borrower creditworthiness, automating trading, managing enterprise risks, and powering customer service. The findings indicate that intelligent financial systems outperform traditional statistical models in predictive accuracy, operational flexibility, and decision-making speed, while also expanding financial inclusion by incorporating diverse and unconventional data. The review further delves into AI's growing influence within specific FinTech sectors, including RegTech, InsurTech, SupTech, PayTech, and WealthTech, illustrating how AI systems aid in ongoing regulatory oversight, automated compliance checks, faster insurance claim processing, and personalized investment advice. Additionally, combining AI with decentralized finance and blockchain technology enhances system robustness, transparency, and automation through smart contracts and secure distributed ledgers. However, despite these advancements, the study points to significant hurdles hindering widespread adoption, such as difficulties in understanding AI models, data privacy and governance issues, ethical considerations, and evolving regulatory landscapes. The research concludes that artificial intelligence will continue to be a driving force in the future of finance, enabling highly tailored financial products, improved fraud prevention, data-informed lending, and more efficient operations.

**Keywords:** Artificial Intelligence (AI), GenAI, Machine Learning, Finance, FinTech, Innovations

