

# The Convergence of Digital Finance and Artificial Intelligence (AI) in Global Payment Systems

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**Abstract:** The global payments landscape is undergoing a structural transformation driven by the convergence of Digital Finance (DF) technologies and Artificial Intelligence (AI). This integration marks a shift from isolated digital payment systems toward interconnected, intelligent, and highly automated financial infrastructures. AI functions as the core intelligence layer across digital rails - including Distributed Ledger Technology (DLT), Central Bank Digital Currencies (CBDCs), stable coins, and mobile networks - optimizing payment routing, enabling real - time fraud detection, and automating compliance obligations such as AML / KYC. The result is enhanced straight-through processing rates exceeding 99%, reduced cross - border transaction frictions, improved liquidity management, and democratized access to enterprise - grade payment capabilities through API - enabled FinTech platforms. However, rapid adoption introduces new systemic challenges, including algorithmic bias, data privacy vulnerabilities, explains ability concerns, and heightened third - party concentration risks. Emerging regulatory frameworks increasingly emphasize transparency, governance, and explainable AI (XAI), as evidenced in supervisory innovations such as the BIS Project Noor. While digital - AI convergence improves efficiency and fosters financial inclusion, uneven technological capacity risks widening the digital divide without deliberate inclusive design and shared digital infrastructure. This study synthesizes global trends, technological architectures, governance models, and strategic imperatives underpinning AI - enabled payment ecosystems. It highlights a future defined by programmable finance, real - time cross - border rails, intelligent automation, and collaborative regulatory innovation - establishing the foundations for secure, ethical, and scalable digital financial systems worldwide.

**Keywords:** Digital Finance, Artificial Intelligence, Global Payment Systems, Block Chain, Distributed Ledger Technology, Cross - Border Payments, CBDCs, AI Governance, Explainable AI (XAI), Regtech, Straight - Through Processing, Financial Inclusion, Programmable Money, Fintech Infrastructure

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