

A Comprehensive Review of Gen AI Agents: Applications and Frameworks in Finance, Investments and Risk Domains

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Abstract This paper surveys the landscape of AI agent frameworks, highlights their core features and differences, and explores their applications in financial services. We synthesize insights from recent industry reports, academic research, and technical blog posts, focusing on frameworks such as CrewAI, LangGraph, LlamaIndex, and others. We also discuss the challenges and opportunities of deploying agentic AI in production environments, with an emphasis on financial trading, investment analysis, and decision support. We analyze the rapidly evolving landscape of agentic AI systems, focusing on their architecture, capabilities, and practical implementations in banking, trading, and risk management. The study examines prominent frameworks including LangGraph for stateful agent orchestration, CrewAI for collaborative multi-agent workflows, and AutoGen for conversational agent systems, alongside industry platforms like IBM Watson and NVIDIA NIM. The study examines both technical frameworks (LangGraph, CrewAI, AutoGen, etc.) and practical implementations in financial institutions. We highlight productivity gains (up to 80% time reduction in data tasks), risk management improvements, and workforce transformation challenges. The paper concludes with recommendations for financial institutions adopting agentic AI solutions. Our analysis reveals three key findings: (1) specialized agent frameworks achieve 50-80% productivity gains in financial data tasks compared to traditional approaches, (2) multi-agent systems demonstrate particular promise in complex domains like algorithmic trading and fraud detection, and (3) successful deployment requires addressing critical challenges in workforce upskilling, risk alignment, and regulatory compliance. The paper provides a theoretical foundation for agentic AI in finance, introducing formal models for agent design patterns, multimodal fusion, and market microfoundations. We further present a summary of several evaluation frameworks for assessing agent performance across financial use cases, including portfolio optimization and AML compliance. The study concludes with recommendations for financial institutions adopting agentic AI, emphasizing the need for standardized architectures, robust testing protocols, and hybrid human-AI workflows.

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