Chapter 11
Mitigating AI Hallucinations in ESG-Driven Credit Risk Advisory–Human–AI Co-Governance in the Enterprise Metaverse

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ABSTRACT

The chapter explores how financial institutions can mitigate AI hallucinations while delivering ESG-driven credit risk advisory within the enterprise metaverse. It argues that hallucinations in generative and predictive models threaten responsible lending, regulatory alignment, and sustainable value creation when unchecked in immersive, real-time advisory environments. Framed around a widening talent gap, the chapter positions human–AI co-governance as essential, requiring advisors who blend financial acumen, ESG expertise, and AI literacy. It proposes an adaptive framework built on strategic upskilling, cultural transformation that normalizes challenging AI outputs, and targeted recruitment and partnerships. Within metaverse-based advisory channels, this framework embeds explainability, stress-testing, and escalation protocols so that human experts can detect, interpret, and constrain hallucinations, enabling trustworthy, ESG-aligned credit decisions in next-generation financial ecosystems.

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INTRODUCTION

In the enterprise metaverse, wealth and credit advisory are increasingly mediated by generative and predictive AI systems that synthesize market, client, and ESG data into immersive decision journeys. The wealth and credit management sectors are undergoing an unprecedented transformation fueled by rapid digitalization, evolving client expectations, and the integration of Environmental, Social, and Governance (ESG) principles into financial decision-making(George, 2024). AI hallucinations fabricated, biased, or context-insensitive outputs pose material risks when such systems guide ESG-driven credit recommendations, portfolio construction, and suitability assessments. As clients demand more responsible and transparent investment practices, firms face an acute shortage of skilled professionals capable of blending traditional financial acumen with digital literacy, data analytics, and ESG-oriented assessment. The convergence of these competencies is redefining how institutions evaluate credit risk, manage client relationships, and sustain long-term competitiveness (Paulino et al., 2025). Wealth managers sit at the frontline of this transformation, acting as both interpreters and gatekeepers of AI-generated insights. This chapter explores the pressing challenge of bridging the talent gap in financial institutions amid accelerating ESG adoption and digital transformation. With experienced relationship managers retiring and a younger workforce seeking flexible, purpose-driven careers, organizations must rethink their talent strategies (Singh, 2025). Traditional hiring approaches are no longer sufficient; firms must focus on upskilling, reskilling, and cultural adaptation to nurture advisors who can operate effectively in hybrid digital ecosystems. Furthermore, the chapter highlights how the infusion of ESG competencies such as understanding sustainable finance, ethical investing, and impact measurement has become essential in modern credit risk assessment frameworks. There is a pressing need for human oversight, where wealth managers can co-exist with AI and pave the way for efficient, prudent and responsible judgement to the AI hallucinated output, to amplify the enterprise metaverse capabilities (Kapoor, 2025).

Through a multidisciplinary lens, this chapter examines the interplay between human capital development, technological enablement, and ESG integration along with measurement of credit risk (Otieno & Busili, 2024). It emphasizes that successful incorporation of ESG metrics in credit assessment requires not only advanced analytical models and automation tools but also professionals equipped to interpret these insights with contextual understanding and ethical responsibility. The shortage of talent with such integrated capabilities has direct implications for firms' ability to evaluate long-term creditworthiness, manage regulatory compliance, and deliver sustainable value creation (Kurznack et al., 2021). The chapter proposes an adaptive