

Democratizing ESG Reporting: Can AI Enable Quality Sustainability Information Disclosure for Resource-Constrained SMEs?

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Abstract

Small and medium-sized enterprises (SMEs) face increasing pressure to disclose transparent environmental, social, and governance (ESG) information driven by regulatory mandates and cascading value chain requirements. However, they underperform in terms of reporting quality compared to large corporations, primarily due to limited resources, technical expertise, and organizational capacity. This creates a fundamental equity problem where those least equipped to comply face identical expectations as resource-rich multinationals. The resulting asymmetry threatens to exclude SMEs from sustainable supply chains, limit their access to ESG-conditional capital, and concentrate competitive advantages among incumbents capable of navigating compliance complexity.

This paper develops and validates an artificial intelligence system designed for UK SME sustainability reporting constraints, incorporating lightweight deployment, simplified interfaces, and reduced configuration needs that acknowledge resource limitations, distinguishing small enterprises from large corporations for which existing AI solutions have been predominantly developed. Through a comparative evaluation of AI-generated sustainability reports against manually produced disclosures from UK SMEs, we assess the generated reports across multiple quality dimensions, including accuracy, comprehensiveness, framework alignment, and stakeholder utility. We examine whether an AI system leveraging a retrieval-augmented generation architecture with conversational interfaces that minimize expertise requirements achieves high accuracy in ESG data extraction and generates reports comparable to or exceeding those produced manually in comprehensiveness and standardization. We investigate whether effectiveness varies by organizational digital maturity, prior sustainability engagement, firm size, or sector, establishing the degree of broad applicability. Findings demonstrate that purpose-built AI systems can democratize access to high-quality ESG reporting capabilities, enabling resource-constrained SMEs to produce disclosures that approach the standards previously requiring dedicated expertise and substantial budgets. Results have implications for technology developers prioritizing SME-specific design principles, policymakers considering subsidies or technical assistance programs, and SME managers evaluating whether AI-enabled approaches offer viable alternatives to expensive consultants or non-compliance risks. However, adoption barriers, including setup costs, integration complexity, and training requirements, suggest that technological capability alone proves insufficient without complementary policy interventions, vendor support mechanisms, and organizational change management strategies. Findings suggest that hybrid models, which combine AI automation with targeted human expertise, are the optimal pathways for most SMEs, rather than fully autonomous systems.

Keywords

Artificial intelligence, large language models, Natural language processing; Small and medium-sized enterprises, ESG information reporting.

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