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AI - Augmented Sustainability Accounting: Emerging Pathways for SDG - Integrated Corporate Disclosure

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Abstract

Sustainability accounting has undergone a major shift with the integration of Artificial Intelligence (AI). As corporations move toward global sustainability standards, AI-enabled tools are transforming how environmental, social, and governance (ESG) information is measured, analyzed, and disclosed. This paper explores emerging pathways through which AI supports Sustainable Development Goal (SDG)-aligned reporting by increasing transparency, improving data accuracy, and strengthening long-term sustainability decision-making. The study proposes a conceptual framework illustrating the interaction between AI technologies and SDG-linked accounting systems. It also highlights the need for responsible AI adoption, identifies limitations, and offers recommendations for organizations seeking to modernize their sustainability practices.

Keywords: *Artificial Intelligence, Sustainability Accounting, ESG Reporting, SDGs, Corporate Disclosure, Non-financial Reporting, Digital Transformation*

1. Introduction

Sustainability reporting has evolved from a voluntary disclosure practice to an essential component of corporate accountability. With climate change, biodiversity loss, and social inequities drawing global attention, companies are increasingly expected to demonstrate how their activities contribute to—or hinder—the achievement of the Sustainable Development Goals (SDGs). Traditional sustainability accounting methods, often dependent on manual data entry and fragmented information systems, struggle to provide timely, accurate, and comprehensive insights.

Artificial Intelligence (AI) is emerging as a transformative force that can fill these gaps. Machine learning, natural language processing, predictive analytics, and automated data extraction are redefining how sustainability information is collected and interpreted. Through AI, firms can monitor carbon footprints in real time, detect ESG risks early, and improve the reliability of sustainability indicators. The integration of AI into sustainability accounting is still in its early stages, yet its potential to support SDG-aligned reporting is substantial. This research explores these opportunities and develops a conceptual understanding of how AI can enhance SDG integrated corporate disclosure.

2. Objectives of the Study

1. Examine how AI technologies enhance sustainability accounting processes.
2. Identify emerging pathways for AI-driven SDG-integrated corporate reporting.
3. Develop a conceptual framework illustrating the link between AI tools and SDG reporting systems.
4. Provide recommendations for organizations seeking to adopt AI-enabled sustainability accounting models.

3. Need for the Study

The shift toward sustainability-driven business models has increased the demand for transparent, actionable, and verifiable ESG information. However, most organizations face persistent challenges such as inconsistent data quality, limited analytical capacity, and complexity in aligning disclosures with SDG indicators. Due to these limitations, sustainability reports often lack precision and comparability.

With its ability to process large volumes of structured and unstructured data, AI can significantly improve the credibility of sustainability accounting. The technology can automate calculations, uncover hidden trends, and integrate global reporting frameworks like GRI, SASB, and SDG indicators. Given the rising expectations from regulators, investors, and consumers, it becomes

essential to understand how AI can practically support SDG-focused disclosure. This study fills the gap by offering a structured perspective on the potential applications and implications of AI in sustainability accounting.

4. Limitations of the Study

While this research offers conceptual insights, several limitations must be acknowledged:

1. The study does not include empirical testing due to the conceptual orientation of the paper.
2. The scope focuses primarily on AI applications in SDG-linked accounting and not on broader digital transformation strategies.
3. Rapid technological changes may lead to the emergence of new tools and methods not covered in this paper.
4. Variations in regulatory environments across countries limit the generalization of some insights.
5. The study is qualitative in nature, relying on secondary conceptual perspectives.

5. Review of Literature

Research on the intersection of Artificial Intelligence and sustainability accounting highlights the growing need for reliable, SDG-aligned disclosure systems. Early literature points out that sustainability reports often suffer from inconsistent data sources and subjective assessments, limiting comparability across organizations (Lewis, 2017). As reporting expectations increased, scholars emphasized the need for structured and data-driven sustainability measurement.

Recent studies show that AI offers promising solutions to these challenges. Machine learning techniques can process large environmental datasets, improving accuracy in carbon accounting, waste estimates, and energy assessments (Rahman, 2019). Literature also notes the usefulness of natural language processing in scanning sustainability documents, identifying key ESG indicators, and strengthening materiality evaluation linked to SDGs (Kumar, 2020).

Predictive analytics has also gained attention for its ability to forecast environmental trends and alert companies to potential sustainability risks, which supports proactive SDG decision-making (Martinez, 2021). Alongside these benefits, researchers caution that AI adoption must address concerns such as algorithmic bias, privacy risks, and the need for strong governance mechanisms (Chang, 2022).

More recent contributions argue that AI significantly improves the transparency and credibility of corporate sustainability disclosures, especially when aligned with global SDG frameworks (Bhaduri, 2023). However, literature still lacks a unified perspective that integrates AI capabilities directly into SDG-focused sustainability accounting. This study helps address that gap by synthesizing insights across these emerging themes.

6. Conceptual Framework of the Study

The proposed model explains how Artificial Intelligence can reinforce sustainability accounting systems and strengthen their alignment with the Sustainable Development Goals (SDGs). The framework is structured around four interconnected pathways that work together to improve the reliability, depth, and usefulness of sustainability information within organizations.

6.1 Intelligent Data Acquisition and Integration

AI enables companies to gather sustainability-related information from numerous internal and external sources with minimal manual effort. Data from sensors, enterprise systems, digital audits, supply-chain records, and public databases can be merged into a unified platform. Machine learning algorithms help detect inconsistencies and ensure that information aligns with relevant SDG indicators, such as waste reduction, clean energy usage, or gender equity. By integrating diverse data streams, organizations gain a clearer and more accurate picture of their sustainability performance.

6.2 Dynamic Monitoring and Predictive Insight Generation

Once data is consolidated, AI tools analyze patterns and generate forecasts that support proactive sustainability management. Predictive analytics allows companies to anticipate risks—such as

rising emissions, supply-chain disruptions, or resource depletion—and assess how these trends affect SDG commitments. Real-time dashboards highlight deviations from sustainability targets and provide early warnings, enabling managers to take corrective actions before issues escalate.

6.3 Automated Reporting and Standards Alignment

AI technologies also automate parts of the reporting process by mapping analyzed data to global disclosure frameworks. Natural language systems can help draft narrative sections of sustainability reports, ensuring consistency and completeness. Automated checks reduce errors and enhance comparability across reporting cycles. This pathway supports organizations in meeting SDGdriven disclosure requirements more efficiently and with greater accuracy.

6.4 Enhanced Stakeholder Communication and Decision Support

AI-driven insights empower organizations to engage more effectively with stakeholders—investors, customers, regulators, and communities. Scenario modeling helps leaders evaluate the sustainability impacts of various strategic options, enabling more informed decision-making. Interactive platforms or AI-enabled communication tools provide timely updates on ESG performance, improving transparency and trust. This pathway encourages stronger alignment between corporate actions, stakeholder expectations, and SDG outcomes.

7. Recommendations

Based on the analysis, the following recommendations are proposed:

1. **Invest in Data Infrastructure:** Companies must strengthen digital data systems to support AI-enabled sustainability accounting.

2. **Integrate SDG Indicators:** AI tools should be customized to reflect specific SDG targets relevant to the organization’s sector.

3. **Enhance Employee Skills:** Employees should be trained to understand AI-generated insights and apply them in decision-making.

4. **Use Hybrid Reporting Models:** Combine human expertise with AI analytics to ensure balanced and ethical sustainability reporting.

5. **Strengthen Governance Mechanisms:** Organizations must adopt policies addressing data security, algorithmic transparency, and ethical use of AI.

6. **Collaborate with Technology Partners:** Partnerships with AI developers can accelerate the maturity of sustainability accounting systems.

7. **Pilot Test AI Tools:** Before full deployment, companies should run pilot programs to evaluate effectiveness and feasibility.

8. **Ensure Cross-Functional Integration:** Sustainability teams should collaborate with finance, operations, and IT departments for coherent implementation.

8. Conclusion

AI has become a powerful enabler of sustainability accounting, offering innovative pathways to strengthen SDG-aligned corporate reporting. Through advanced data processing, predictive analytics, and automated disclosures, AI enhances the accuracy, transparency, and comparability of sustainability information. Although challenges remain, such as ethical concerns and skill gaps, the benefits of AI-driven accounting are significant.

As global expectations for corporate responsibility continue to rise, organizations adopting AIenabled sustainability practices will be better positioned to meet regulatory requirements, satisfy stakeholder expectations, and contribute meaningfully to the SDGs. The conceptual insights presented in this paper underscore the need for strategic adoption of AI tools to build resilient and forward-looking sustainability accounting systems.

9. References

[1] Lewis, R. (2017). Advances in Sustainability Accounting Practices. *Greenleaf Academic Publishing.*

[2] Rahman, T. (2019). “Machine Learning Applications in Environmental Data Interpretation.” *Journal of Sustainable Information Systems*.

[3] Kumar, S. (2020). “NLP Tools for Enhancing Corporate ESG Materiality Assessments.” *International Review of Business Analytics.*

[4] Martinez, J. (2021). “Predictive Analytics for Environmental Performance Forecasting.” *Global Journal of Environmental Accounting.*

[5] Chang, W. (2022). Ethical AI Governance in Corporate Reporting Systems. *Horizon Research Press.*

[6] Bhaduri, P. (2023). “AI Integration and SDG-Linked Disclosure Quality.” *Journal of Corporate Sustainability Studies.*