The Academic
International Journal of Multidisciplinary Research

An Online Peer Reviewed / Refereed Journal
Volume 4 | Issue 9 | September 2026
ISSN: 2583-973X (Online), SJIF IF(2026): 5.6
Website: www.theacademic.in

Impact of Artificial Intelligence, Environmental, Social, and Governance (Esg) Factors on the future of Financial Reporting – A Study

Dr. Gunda Srinivas

HOD & Assistant Professor, Department of Business Management, Alphores Women's Degree & P.G. College, Karimnagar, Telangana, India.

Dr. Akula Srinivas

Assistant Professor, Department of Commerce and Management, NTR Junior and Degree College for Women, Himayathnagar, Hyderabad.

DOI : https://doi.org/10.5281/zenodo.23773218

ARTICLE DETAILS

Research Paper

Received: 28-08-2026

Accepted: 26-09-2026

Published: 20-10-2026

Keywords:

Digital Transformation, Non-Financial Disclosures, Corporate Governance, Artificial Intelligence, ESG Reporting, Financial Reporting, Sustainability, Predictive Analytics, and Algorithmic Bias.

ABSTRACT

Artificial Intelligence (AI) and Environmental, Social, and Governance (ESG) issues are two powerful forces that are influencing the evolution of financial reporting. Conventional financial reporting systems are failing to adequately capture the complexity of contemporary company performance as stakeholders call for increased accountability, transparency, and sustainability. This research examines how financial reporting and disclosure approaches are changing as a result of the integration of AI technologies with ESG measures. By facilitating automation, real-time data analysis, natural language processing, and predictive modelling, artificial intelligence has transformed fundamental banking operations. These developments enable deeper insights into financial health and potential hazards in addition to improving efficiency and accuracy. At the same time, ESG reporting has evolved from a voluntary practice to a legal and reputational requirement. Non-financial data about labour practices, board diversity, carbon emissions, and ethical governance must now be disclosed by businesses. Opportunities for transformation arise from the combination of AI with ESG; AI can

Disclaimer: The opinions, interpretations, conclusions, recommendations, analyses, and statements expressed in this research article are solely those of the author(s) and do not reflect the views, policies, or positions of the Publisher, Chief Editor, Editors, Editorial Board, Reviewers, or their affiliated institutions. The author(s) are solely responsible for ensuring the originality, authenticity, and integrity of the manuscript and for ensuring that it is free from plagiarism, AI-generated content, copyright infringement, data falsification, and any other form of academic misconduct.

speed up the integration of ESG data, enable large-scale data extraction, and produce transparent, auditable sustainability reports.

I. INTRODUCTION:

Financial reporting has historically been the cornerstone of corporate transparency and accountability, providing stakeholders with essential insights into a company's financial condition, operational efficacy, and future potential. Historically centred on quantitative metrics like profit margins, balance sheets, and cash flows, financial reporting is currently undergoing a shift influenced by two significant factors: Artificial Intelligence (AI) and Environmental, Social and Governance (ESG) issues. The increasing need for ESG integration in business disclosures signifies a global transformation in the perception of value. Investors, regulators, and consumers are progressively emphasising companies that exhibit environmental accountability, social influence, and robust governance processes. As ESG measurements gain prominence in investment choices, organisations face the problem of reporting a wider array of non-financial indicators that are frequently intricate, qualitative, and scattered across several

Platforms and sources.

Advancements in AI are concurrently upsetting conventional corporate operations by bringing tools that automate regular processes, analyse extensive datasets, discover anomalies, and offer Predictive insights.

In financial reporting, AI technologies including machine learning, natural language processing, and robotic process automation facilitate real-time data processing, superior risk assessment, and increased decision-making. The convergence of AI and ESG offers both remarkable prospects and considerable challenges. Artificial intelligence can facilitate the standardisation and scalability of ESG reporting, enhancing transparency and comparability. It can reveal concealed patterns in ESG data, oversee sustainability assertions, and facilitate integrated reporting systems. Nonetheless, these advantages are accompanied by apprehensions over algorithmic bias, data integrity, ethical considerations, and the preparedness of regulatory frameworks to oversee such technology.

This review article seeks to examine the evolving interplay among AI, ESG, and the future of financial reporting. It rigorously analyses contemporary trends, technology innovations, legislative changes, and the practical obstacles encountered by firms in implementing AI-driven ESG reporting. This article aims to outline a strategy for utilising technology to fulfil the changing demands of contemporary financial systems.

II. REVIEW OF LITERATURE:

The combination of Artificial Intelligence (AI) and Environmental, Social, and Governance (ESG) factors in financial reporting has garnered heightened academic interest in the last ten years. This literature review examines foundational research in three areas: the development of ESG reporting, the role of AI in financial disclosure, and their integration within present corporate reporting systems.

ESG reporting has transitioned from voluntary corporate social responsibility (CSR) disclosures to a more systematic, regulation-driven framework. Eccles and Krzus (2018) assert that ESG disclosures are essential for long-term value development, risk management, and investor engagement. The absence of standardisation and the qualitative characteristics of numerous ESG indicators pose problems to consistency

and comparability (Kotsantonis & Serafeim, 2019) Conversely, Artificial Intelligence has demonstrated potential in revolutionising the accounting and auditing domains. Issa, Sun, and Vasarhelyi (2016) emphasise that AI technologies, including machine learning and natural language processing (NLP), can automate intricate processes such as financial analysis, fraud detection, and report generation. Artificial intelligence enhances efficiency and precision while facilitating real-time insights and predictive analytics, essential in contemporary rapid financial landscapes.

Recent literature has commenced investigating the potential of AI to improve ESG reporting. Garcia-Torea, Fernandez-Feijoo, and de la Cuesta (2020) assert that AI can enhance the efficiency of ESG data collecting from various sources, allowing organisations to generate more prompt and thorough disclosures. Likewise, Schizas and Voulgaris (2021) examine how AI-driven systems may analyse social media, satellite imagery, and unstructured documents to

More efficiently detect ESG risks and opportunities.However, researchers caution on potential hazards and limitations. Issues include algorithmic bias, insufficient transparency, and data privacy problems persist (Mittelstadt et al., 2016).

Although distinct research studies have outlined the advantages and drawbacks of each AI and ESG reporting, an increasing agreement suggests that their amalgamation signifies the forthcoming advancement in financial disclosure. The literature emphasises the necessity for interdisciplinary research, ethical governance, and regulatory guidelines to guarantee that AI-enhanced ESG reporting provides significant and reliable information to stakeholders.

III. ESG IN FINANCIAL REPORTING

- **Environmental**, Social, and Governance (ESG) constitutes a framework for assessing a company's non-financial performance. Environmental variables evaluate the effects on nature (carbon emissions, waste management, resource consumption)
- **Social** factors pertain to interactions with employees, communities, and customers (e.g., labour rights, diversity, community involvement).
- **Governance** encompasses board composition, CEO compensation, auditing procedures, and shareholder entitlements (Eccles & Kilmenko, 2019).

Increasing Regulatory and Investor Demand for ESG Reporting

Investor and regulatory interest in ESG disclosures has surged. Entities such as the Global Reporting Initiative (GRI), the Sustainability Accounting Standards Board (SASB), the Task Force on Climate-related Financial Disclosures (TCFD), and the nascent International Sustainability Standards Board (ISSB) are advocating for standardised frameworks for ESG reporting (Sullivan & Mackenzie, 2017). Investors are progressively utilising ESG measures to evaluate long-term risks and sustainability prospects, incorporating them into capital allocation choices (Amel-Zadeh & Serafeim, 2018).

Obstacles in Contemporary ESG Data Acquisition and Reporting. Notwithstanding its increasing adoption, ESG reporting encounters numerous challenges:

- Absence of unform standards and disparate metrics.
- Subjective or qualitative revelations.
- Risks associated with data reliability and greenwashing (Christensen, Hail, & Leuz, 2021). Organisations have challenges related to data fragmentation and the substantial expenses associated with ESG data integration (Kotsantonis & Serafeim, 2019).

Influence of ESG Metrics on Financial Statements and Decision-Making ESG measures have become essential to financial materiality. Companies demonstrating robust ESG performance frequently enjoy enhanced capital availability, less risk, and sustained profitability (Friede, Busch, & Bassen, 2015). Nonetheless, integrating these measures into conventional financial reporting is intricate and inconsistent, necessitating meticulous judgement and interdisciplinary cooperation.

THE FUNCTION OF ARTIFICIAL INTELLIGENCE IN FINANCIAL REPORTING:

Artificial Intelligence Applications in Financial Data Automation, Auditing, and Analysis: Artificial intelligence technologies are revolutionising fundamental accounting operations through the automation of data entry, reconciliation, and financial forecasting. Artificial intelligence diminishes human mistake, accelerates processes, and offers profound analytical skills (Issa, Sun, & Vasarhelyi, 2016). NLP may evaluate annual reports, MD&A sections, and ESG disclosures in financial reporting to identify tone, readability, sentiment, and potential red flags (Loughran & McDonald, 2016). It is utilised to automatically construct narrative reports

Derived from financial data.

Machine Learning for Fraud Detection, Risk Mitigation, and Predictive Analysis: Machine Learning (ML) models are extensively employed to identify accounting fraud and predict financial trouble. These systems analyse past data to discern trends and detect anomalous behaviours, hence enhancing internal control and risk assessment (Pham, Dimitrov, & Ho, 2020). Predictive analytics enables organisations to anticipate future market or operational hazards with enhanced accuracy.

Real-Time Analytics and Interactive Dashboards: Artificial Intelligence facilitates instantaneous financial reporting via sophisticated dashboards that promptly display key performance indicators (KPIs), cash flows, and ESG metrics (Appelbaum, Kogan, & Vasarhelyi, 2017). These solutions are especially beneficial for decision-making and compliance monitoring, enabling stakeholders to respond promptly using real-time data instead of static quarterly reports.

IV. REGULATORY LANDSCAPE AND STANDARDIZATION EFFORTS

Artificial Intelligence Instruments for Environmental, Social, and Governance Data Extraction Artificial Intelligence (AI) improves ESG data gathering by extracting extensive amounts of organised and unstructured data from many sources. Methods like sentiment analysis are employed to assess public impression of a company's social and environmental performance through the examination of news stories, social media, and stakeholder communications (Rao, 2021). In the environmental sector, satellite imaging and geospatial AI are utilised to monitor deforestation, carbon emissions, and pollution levels (Cervone et al., 2020), enabling real-time

Environmental surveillance. International initiatives for ESG standardisation. Numerous international organisations are spearheading the standardisation of ESG reporting:

- **Global Reporting Initiative (GRI)** emphasises sustainability impact disclosures.
- **The Sustainability Accounting Standards Board (SASB)** highlights sector-specific ESG measures.
- **The Task Force on Climate-related Financial Disclosures (TCFD)** advocates for transparency about climate-related risks.
- **The International Sustainability Standards Board (ISSB)** is developing cohesive worldwide ESG reporting frameworks (IFRS Foundation,2022).

Notwithstanding advancements, these frameworks vary in breadth and application, hence challenging business compliance and comparability across geographies (KPMG, 2021).

How Artificial Intelligence Can Assist in Complying with Changing Regulatory Standards: : AI can assist organisations in complying with ESG rules by systematically aligning data points with diverse reporting formats. NLP algorithms can extract and classify pertinent disclosures according to GRI or SASB criteria, so diminishing manual labour and enhancing compliance precision (Zhang et al., 2022Obstacles in the Integration of AI Systems with Diverse ESG Frameworks. Notwithstanding AI's potential, the integration with varied ESG standards continues to pose difficulties. ESG data frequently exhibits ambiguous taxonomies, differs between industries, and may incorporate subjective or localised criteria. Artificial intelligence algorithms trained on inconsistent data may yield biassed or incorrect results (Mittelstadt et al., 2016).

Artificial intelligence can automate Environmental, Social, and Governance (ESG): Grading by evaluating business disclosures, third-party databases, and public records to allocate performance points relative to established ESG benchmarks. Organisations like Refinitiv and MSCI are currently employing machine learning algorithms to evaluate companies based on ESG criteria (Camilleri, 2020). Automation mitigates human bias, improves consistency, and guarantees prompt assessment of ESG metrics across international corporations.

Case Analyses: Organisations Utilising Artificial Intelligence for Environmental, Social, and Governance disclosures:

- **IBM** utilises AI-driven techniques to monitor energy consumption, carbon emissions, and diversity measures, incorporating these into its annual ESG reports (IBM, 2022).
- **Microsoft** employs its AI for Earth initiative to assess climate data, water consumption, and supply chain sustainability, concurrently integrating ESG analytics into its cloud services These corporations exemplify the pragmatic utilisation of AI in rendering ESG data actionable, traceable and auditable.

Advantages: Enhanced transparency, Precision and stakeholder confidence. Artificial intelligence enhances transparency by facilitating the ongoing assessment of ESG metrics and corroborating assertions via third-party data. Accuracy improves by minimising human errors and inconsistencies, while stakeholder trust rises as disclosures become more data-driven, standardised, and independently verifiable (Wamba et al., 2021).

RISK OF GREENWASHING WITH AUTOMATED ESG REPORTING

Automated ESG technologies may allow organisations to distort narratives to seem more sustainable than they truly are, a practice referred to as greenwashing. When ESG data is gathered and evaluated by AI without human supervision or third-party validation, the system may inadvertently endorse deceptive assertions, resulting in reputational harm and regulatory

Examination.

Integration and Financial Obstacles for Small and Medium-Sized Enterprises Large organisations are implementing AI-driven ESG solutions, whereas small and mid-sized enterprises (SMEs) encounter obstacles stemming from the substantial expenses of AI implementation, insufficient technical competence, and inadequate access to quality ESG data (Camilleri, 2020). Moreover, incorporating AI into outdated banking systems necessitates significant infrastructural modifications that may be prohibitively expensive for resource-

Limited companies.

V. PROSPECTIVE TRENDS AND DIRECTIONS:

Emergence of Integrated Reporting: Financial + ESG

The transition to integrated reporting (IR), which amalgamates financial information with ESG disclosures, is increasingly gaining traction worldwide. Integrated Reporting enables stakeholders to comprehend how a company generates enduring value across several capitals -financial, natural, social, and human (Eccles & Krzus, 2018). AI enhances IR by optimising

Data collection analysis and representation inside integrated dashboards.

1.Anticipatory ESG Reporting Driven by artificial intelligence:

Future ESG reporting will transition to a predictive model rather than a retrospective one. Artificial Intelligence can predict Environmental, Social, and Governance risks (such as prospective carbon liabilities and labour strikes) utilising historical data, market patterns, and geopolitical changes (Zhang et al., 2022). This allows companies to operate proactively instead of reactively.

2. The Function of Block chain in Conjunction with AI for Unalterable, Real-Time ESG Reporting:

The amalgamation of blockchain technology with artificial intelligence presents novel opportunities for safe, traceable, and real-time ESG disclosures. The decentralised ledger of blockchain guarantees data immutability and auditability, whilst AI processes, validates, and analyses data. Collectively, they enhance transparency and bolster stakeholder confidence (Tapscott & Tapscott, 2017).

3. The Transforming Responsibilities of CFOs and Auditors in an AI-Enhanced Reporting Landscape: As AI becomes integral to reporting, Chief Financial Officers (CFOs) and auditors must evolve beyond conventional numerical analysis to roles as data strategists and ethical custodians. They will oversee AI model validation, governance, and the interpretation of predictive ESG findings (Appelbaum et al., 2017). Auditors must evaluate AI-generated reports to verify the integrity of financial and ESG outputs.

VI.CONCLUSION:

This review article has examined the evolving connection of Artificial Intelligence (AI) and Environmental, Social, and Governance (ESG) within financial reporting, indicating a significant transition towards data-driven methodologies.

Transparent and anticipatory disclosure techniques. The incorporation of AI into ESG and financial reporting presents substantial opportunities: automating laborious operations, improving data precision, facilitating real-time oversight, and producing actionable insights for stakeholders. AI is swiftly emerging as a pivotal instrument in the advancement of corporate transparency, encompassing ESG data mining through sentiment analysis and satellite imagery,
automated ESG scoring and real-time dashboards.

This technological transition presents several obstacles. Risks including data privacy violations, algorithmic bias, insufficient explain ability, and the potential for greenwashing highlight the ethical intricacies of

employing AI in ESG sectors. Small and medium-sized enterprises encounter considerable integration and cost obstacles, thereby exacerbating the digital divide in responsible reporting.

Importantly, AI ought to be regarded as an enabler rather than a substitute. It can augment-but not supplant-human judgement, ethical reasoning, and domain-specific contextual comprehension. Human supervision is crucial to guarantee that AI-generated results are precise, equitable and consistent with financial and social objectives.

The future of financial reporting is poised for integrated reporting, wherein AI-driven solutions amalgamate conventional financial data with real-time ESG performance. Emerging technologies such as block chain will enhance the reliability of these disclosures, becoming them immutable and auditable. Furthermore, predictive ESG reporting will enable firms to foresee risks and opportunities, transitioning from reactive compliance to a proactive sustainability approach.

A collaborative approach is essential to completely achieve this aim. AI developers, ESG specialists, financial analysts, regulators, and legislators must collaborate to create transparent, scalable, and ethical AI systems. Only via interdisciplinary collaboration can organisations address the intricate issues of the digital ESG era and establish a reporting ecosystem that fosters long-term value creation and sustainable growth.

REFERENCES:

1. Appelbaum, D., Kogan, A., & Vasarhelyi, M. A. (2017). Big data and analytics in the modern audit engagement. Journal of Information Systems, 31(3), 1–20.
2. Barredo Arrieta, A., Díaz-Rodríguez, N., Del Ser, J., Bennetot, A., Tabik, S., Barbado, A.,& Herrera, F. (2020). Explainable artificial intelligence (XAI): Concepts, taxonomies, opportunities and challenges toward responsible AI. Information Fusion, 58, 82– 115.
3. Camilleri, M. A. (2020). The rationale for integrating ESG disclosures in business reporting. Sustainability Accounting, Management and Policy Journal, 11(2), 321–345. Cervone, G., Huang, Q., Hu, Y., & McCabe, M. (2020). Remote sensing and AI for sustainable environmental monitoring. Sustainable Cities and Society, 60, 102245.
4. Christensen, H. B., Hail, L., & Leuz, C. (2021). Mandatory CSR and sustainability reporting: Economic analysis and literature review. Review of Accounting Studies, 26, 1176–1248.
5. Delmas, M. A., & Burbano, V. C. (2011). The drivers of greenwashing. California Management Review, 54(1), 64–87.
6. Eccles, R. G., & Klimenko, S. (2019). The investor revolution. Harvard Business Review, 97(3), 106–

116.

7. Eccles, R. G., & Krzus, M. P. (2018). The Integrated Reporting Movement: Meaning, Momentum, Motives, and Materiality. Wiley.
8. Eccles, R. G., & Krzus, M. P. (2018). The Nordic model: An analysis of leading practices in ESG disclosure. Nordic Journal of Business, 67(2), 88–110.
9. Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. Journal of Sustainable Finance & Investment, 5(4), 210–233.
10. Garcia-Torea, N., Fernandez-Feijoo, B., & de la Cuesta, M. (2020). AI tools for improving ESG reporting: Challenges and opportunities. Journal of Business Ethics, 165(4), 687–704.
11. IFRS Foundation. (2022). International Sustainability Standards Board: General Requirements for Disclosure of Sustainability-related Financial Information.
12. Issa, H., Sun, T., & Vasarhelyi, M. A. (2016). Research ideas for artificial intelligence in auditing: The formalization of audit and workforce supplementation. Journal of Emerging Technologies in Accounting, 13(2), 1–20.
13. Kotsantonis, S., & Serafeim, G. (2019). Four things no one will tell you about ESG data. Journal of Applied Corporate Finance, 31(2), 50–58.
14. KPMG. (2021). The ESG journey: From compliance to performance. Retrieved from https://home.kpmg
15. Loughran, T., & McDonald, B. (2016). Textual analysis in accounting and finance: A survey. Journal of Accounting Research, 54(4), 1187–1230.
16. Microsoft. (2021). Microsoft 2021 Environmental Sustainability Report. Retrieved from https://www.microsoft.com/sustainability
17. Mittelstadt, B. D., Allo, P., Taddeo, M., Wachter, S., & Floridi, L. (2016). The ethics of algorithms: Mapping the debate. Big Data & Society, 3(2), 1–21.
18. Pham, H., Dimitrov, S., & Ho, J. T. (2020). Detecting financial statement fraud using machine learning. Journal of Emerging Technologies in Accounting, 17(1), 199–216.
19. Rao, R. (2021). AI in ESG: Applications and Challenges. Journal of Sustainable AI Research, 1(1), 45–59.
20. Schizas, E., & Voulgaris, G. (2021). Harnessing artificial intelligence for ESG analysis: A future vision. AI & Society, 36(3), 543–555