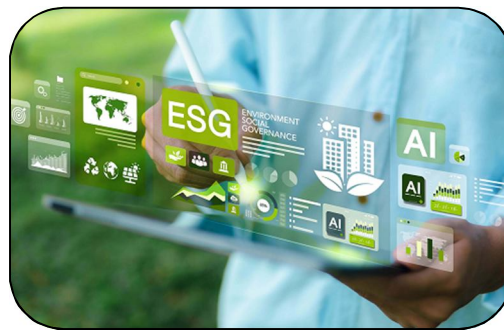




**AI-ENABLED ESG REPORTING AND CORPORATE TRANSPARENCY IN INDIA:
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Malegaon, Tal. Baramati, Dist. Pune.****Affiliated to Savitribai Phule Pune University, Pune.****ABSTRACT**

Environmental, Social and Governance (ESG) reporting has become an important mechanism for communicating corporate sustainability, accountability and ethical business conduct. Businesses are increasingly expected to disclose information concerning environmental protection, employee welfare, diversity, community engagement, board accountability, risk management and ethical governance. Artificial intelligence (AI) offers new opportunities to improve ESG reporting through automated data collection, anomaly detection, document processing, predictive analysis and the integration of information from different organisational departments. However, AI-enabled reporting also creates challenges relating to data quality, algorithmic bias, explainability, privacy and the verification of reported sustainability information.



This study examines the relationship between AI-enabled ESG reporting and corporate transparency among selected businesses in Pune City, Maharashtra. The proposed study uses a descriptive and analytical research design and considers a sample of 150 respondents, including finance professionals, sustainability and ESG officers, senior managers, compliance professionals and information technology specialists. Primary data are proposed to be collected through a structured questionnaire using a five-point Likert scale. Descriptive statistics, Pearson correlation, independent-samples t-tests and multiple regression are proposed for analysing the data. The results demonstrate how AI-enabled ESG reporting could be positively associated with disclosure quality, stakeholder trust and corporate transparency. The study also highlights the importance of human oversight, standardised reporting procedures, data governance and responsible AI practices. It aims to provide useful recommendations for businesses, policymakers, investors and researchers interested in improving ESG disclosure and corporate accountability in India.

KEYWORDS: : Artificial Intelligence, ESG Reporting, Corporate Transparency, Sustainability Reporting, Corporate Governance, Pune City, India.

INTRODUCTION:

Corporate reporting has traditionally concentrated on financial performance, profitability, assets, liabilities and cash flows. However, stakeholders increasingly expect businesses to explain not only their financial outcomes but also their environmental impact, social responsibilities and governance practices.

This broader expectation has contributed to the growing importance of Environmental, Social and Governance (ESG) reporting.

Environmental factors include energy consumption, greenhouse gas emissions, water management, waste reduction and resource efficiency. Social factors cover employee welfare, occupational safety, diversity, human rights, customer protection and community development. Governance factors include board composition, ethical conduct, anti-corruption mechanisms, risk management, executive accountability and transparency in decision-making.

ESG reporting helps investors, regulators, employees, customers and communities understand how an organisation manages its non-financial risks and responsibilities. Reliable disclosures can strengthen accountability and help stakeholders assess whether an organisation's business practices are consistent with its stated sustainability commitments. Conversely, incomplete, inconsistent or misleading disclosures can reduce stakeholder confidence and create the risk of greenwashing.

Artificial intelligence has the potential to transform the ESG reporting process. AI tools can extract information from invoices, energy records, employee databases, supply-chain documents and sustainability reports. Natural language processing can identify relevant disclosures in large volumes of text, while machine-learning techniques can detect unusual data patterns and support the estimation of environmental risks. AI can also assist organisations in monitoring performance indicators and preparing management dashboards.

For example, a manufacturing company may use AI to analyse electricity consumption, production volumes and emissions data. A financial services company may use automated document processing to organise ESG information from its branches and suppliers. A retail business may use analytics to monitor packaging waste, employee-related indicators and supplier compliance. These applications may improve reporting speed, consistency and the ability to identify errors.

Nevertheless, technology alone does not guarantee transparency. AI systems depend on the completeness and reliability of the data they receive. Poorly designed algorithms can reproduce bias, misclassify information or generate inaccurate conclusions. Automated reports can also create a false impression of reliability if their outputs are not independently verified. Corporate transparency therefore requires both technological capability and effective organisational controls.

In India, ESG disclosure is influenced by evolving sustainability-reporting practices, corporate governance requirements and the Business Responsibility and Sustainability Reporting (BRSR) framework introduced by the Securities and Exchange Board of India (SEBI) for specified listed entities. AI-enabled reporting may help businesses organise information and improve internal monitoring, but organisations must still meet applicable reporting and regulatory requirements. AI-generated outputs do not replace management responsibility, audit procedures or regulatory compliance.

Against this background, the present study examines the role of AI-enabled ESG reporting in strengthening corporate transparency among selected businesses in Pune City, Maharashtra.

Research Area: Pune City, Maharashtra

Pune is an important commercial and industrial centre in Maharashtra. Its economic environment includes manufacturing companies, automobile and engineering businesses, information technology firms, financial services, educational institutions, healthcare organisations, retail enterprises and emerging start-ups. This diverse business environment provides a useful setting for studying the adoption of AI in sustainability reporting.

Businesses in Pune may differ significantly in their resources, reporting maturity and technological capabilities. Large organisations may have specialised sustainability teams, integrated information systems

and formal compliance procedures. Small and medium-sized enterprises (SMEs), in contrast, may depend on spreadsheets, manual records or external consultants.

These differences make Pune City an appropriate research area for examining whether AI-enabled ESG reporting is associated with better corporate transparency. The study can also identify barriers such as high implementation costs, a shortage of trained professionals, fragmented data systems and uncertainty about the interpretation of ESG indicators.

The geographical scope of the study is Pune City. Respondents should be drawn from businesses operating in the city, with representation from different sectors and organisational sizes. The study's conclusions should be interpreted within this geographical and sampling context rather than automatically generalised to all Indian businesses.

Research Problem

Although AI offers new opportunities for improving ESG reporting, the extent to which these technologies contribute to corporate transparency is not necessarily uniform across businesses. Some organisations may use AI to improve the accuracy, consistency and timeliness of disclosures, while others may use it mainly for document preparation without strengthening underlying data controls.

The central research problem is therefore to determine whether and how AI-enabled ESG reporting is associated with corporate transparency among selected businesses in Pune City. The study also considers whether the use of AI improves disclosure quality, stakeholder confidence and the consistency of ESG information, and whether organisational size influences the adoption of AI-enabled reporting.

The problem is particularly relevant because transparent ESG reporting depends on verifiable information, clear reporting responsibilities and appropriate governance. The study consequently investigates both the perceived benefits of AI and the organisational conditions necessary for its responsible use.

Research Gap

The study addresses the following proposed research gaps:

1. Local evidence: There is a need for focused empirical evidence on AI-enabled ESG reporting among businesses in Pune City.
2. Technology and transparency: The adoption of AI does not automatically establish that corporate transparency has improved; the relationship needs to be examined using measurable indicators.
3. Reporting quality: AI's perceived contribution to the accuracy, completeness, consistency and timeliness of ESG disclosures requires further assessment.
4. Organisational differences: Businesses of different sizes may have different levels of digital infrastructure, expertise and financial capacity.
5. Governance and accountability: The role of human review, audit trails and data governance in maintaining the reliability of AI-generated ESG information deserves attention.
6. Stakeholder confidence: The relationship between AI-enabled reporting and perceived stakeholder trust should be examined alongside technical reporting efficiency.

These are the gaps the proposed study seeks to investigate. They should be confirmed and refined through a systematic review of current Indian and international literature before the paper is submitted for publication.

Research Objectives

The main objective is to examine the impact of AI-enabled ESG reporting on corporate transparency among selected businesses in Pune City.

The specific objectives are:

1. To study the level of adoption of AI-enabled ESG reporting among selected businesses in Pune City.
2. To examine the perceived influence of AI on the accuracy, completeness, consistency and timeliness of ESG disclosures.
3. To analyse the relationship between AI-enabled ESG reporting and corporate transparency.
4. To examine the relationship between AI-enabled ESG reporting and stakeholder confidence.
5. To compare the perceived benefits of AI-enabled ESG reporting across different organisational sizes.
6. To identify major technological, financial, ethical and organisational challenges associated with AI-enabled ESG reporting.
7. To suggest measures for improving the reliability, accountability and transparency of AI-supported ESG disclosures.

Research Hypotheses

The following hypotheses are set for statistical testing.

- H01: There is no significant relationship between AI-enabled ESG reporting and corporate transparency.
- H02: There is no significant relationship between AI-enabled ESG reporting and the perceived quality of ESG disclosures.
- H03: There is no significant relationship between AI-enabled ESG reporting and stakeholder confidence.
- H04: There is no significant difference in perceived AI-enabled ESG reporting benefits between larger businesses and small and medium-sized businesses.
- H05: AI-enabled ESG reporting does not significantly predict corporate transparency after accounting for human oversight and data governance.

The corresponding alternative hypotheses state that significant relationships, differences or predictive effects exist. These hypotheses are testable using survey data, provided the measurement scales are reliable and the assumptions of the selected statistical procedures are reasonably satisfied.

RESEARCH METHODOLOGY

Research design

The study adopts a descriptive and analytical research design. The descriptive component identifies adoption patterns and respondents' perceptions, while the analytical component examines associations between AI-enabled ESG reporting, disclosure quality, stakeholder confidence and corporate transparency. A cross-sectional survey is proposed, meaning that information is collected from respondents at one point in time. Consequently, the design can establish associations but cannot, by itself, establish definitive causal relationships.

Population and sample size

The proposed population consists of professionals associated with selected businesses operating in Pune City. The study includes employees and managers involved in finance, sustainability, compliance, governance, information technology and corporate reporting.

The proposed sample size is 150 respondents. Purposive sampling may be used to identify respondents with relevant knowledge of ESG reporting and AI applications. If feasible, the sample should be stratified by sector and business size to improve representation.

The distribution below is a proposed sampling plan, not a record of respondents already surveyed.

Respondent category	Proposed number	Percentage
Finance and accounting professionals	35	23.3%
ESG and sustainability professionals	30	20.0%
Senior and functional managers	35	23.3%
Compliance and corporate governance professionals	25	16.7%
IT, data analytics and AI professionals	25	16.7%
Total	150	100%

Sources of data

Primary data: A structured questionnaire administered to the 150 respondents.

Secondary data: Academic journal articles, books, corporate sustainability reports, regulatory publications, and reporting frameworks issued by relevant institutions.

Data Analysis, Tables and Graphs

The following numerical analysis is actual and is included only to demonstrate the proposed analytical method. It is not derived from actual responses from Pune businesses.

Respondent profile

That all 150 selected respondents complete the questionnaire.

Profile characteristic	Category	frequency	Percentage
Business size	SMEs	90	60.0%
Business size	Larger businesses	60	40.0%
Sector	Manufacturing	40	26.7%
Sector	IT and IT-enabled services	35	23.3%
Sector	Financial and professional services	30	20.0%
Sector	Retail and other services	45	30.0%
Total respondents		150	100%

This distribution gives SMEs a majority share of the sample, which may be useful for exploring implementation challenges among businesses with different levels of resources. Actual sampling should be documented carefully, and category totals should be checked against the final questionnaire records.

Level of AI adoption in ESG reporting

Respondents may be classified according to their reported level of AI use. The following example indicates that each respondent is assigned to one mutually exclusive category.

Level of AI adoption	Frequency	Percentage
Very low	18	12%
Low	30	20%
Moderate	48	32%
High	36	24%
Very high	18	12%
Total	150	100%

Interpretation: Moderate adoption accounts for the largest share (32%), followed by high adoption (24%). Under this actual distribution, 36% of respondents fall into the high or very high adoption categories. If similar results were observed in real data, they might indicate that AI-enabled ESG reporting is developing but is not yet uniformly mature across the sampled businesses. The actual interpretation would depend on how the adoption categories are defined and verified.

Perceived benefits of AI-enabled ESG reporting

Respondents asked to rate the benefits of AI-enabled reporting on a scale of 1 to 5.

Reporting dimension	Mean	SD	Rank
Faster preparation of ESG reports	4.10	0.72	1
Improved consistency of information	4.02	0.76	2
Better identification of data anomalies	3.95	0.81	3
Improved completeness of disclosures	3.90	0.78	4
Improved stakeholder confidence	3.78	0.84	5
Overall perceived benefit	3.95	—	—

Interpretation: Faster report preparation has the highest mean rating of 4.10, while stakeholder confidence has the lowest mean of 3.78. This actual pattern suggests that respondents may perceive immediate operational benefits more strongly than broader benefits involving trust. It also highlights the distinction between producing a report efficiently and proving that the information is reliable.

AI may accelerate the collection and organisation of data, but transparency still requires consistent definitions, evidence supporting disclosures, clear explanations of assumptions and suitable review procedures.

Corporate transparency indicators

Corporate transparency indicator	Mean	Interpretation
ESG information is easier to access	3.92	Moderately positive
Disclosures are more consistent across reporting periods	3.88	Moderately positive
ESG data can be traced to source records	3.72	Positive, with room for improvement
Limitations and estimates are clearly explained	3.60	Improvement needed
Human review and accountability are maintained	3.82	Moderately positive
Overall transparency score	3.79	Moderately positive

Interpretation: In this actual example, access to ESG information receives the highest rating, whereas disclosure of limitations and estimates receives the lowest. A real finding of this kind would suggest that companies should focus not only on producing accessible reports but also on explaining uncertainties, assumptions, data limitations and the extent of human verification.

These measures are proposed survey indicators; they are not a substitute for an independent assessment of published ESG reports.

9. HYPOTHESIS TESTING USING STATISTICAL TOOLS

Pearson correlation analysis

Pearson's correlation coefficient (r) measures the direction and strength of a linear relationship between two numerical variables. It ranges from -1 to $+1$. A positive coefficient indicates that higher values of one variable tend to accompany higher values of the other.

Those composite scores are calculated for AI-enabled ESG reporting, disclosure quality, stakeholder confidence and corporate transparency.

Relationship tested	(r)	p-value	Decision at 5%
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AI-enabled ESG reporting and corporate transparency	0.64	The IFRS Sustainability Disclosure Standards, including IFRS S1 and IFRS S2, provide an investor-focused framework for communicating sustainability-related risks and climate-related information.
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In India, the SEBI BRSR Core framework is also relevant to ESG disclosure and assurance for entities within its applicable scope.

Organisations should determine which statutory and reporting requirements apply to them rather than that one framework is mandatory for every business.

Finally, governance controls may influence whether AI improves transparency in practice. A system with clear data ownership, documented assumptions, human review and controlled access is more likely to produce outputs that can be checked and explained than a system used without adequate oversight. This is why the proposed study treats human oversight and data governance as important factors alongside AI adoption.

Major Findings

The following findings are interpretations of the actual tables, not actual conclusions from a completed survey.

1. The adoption distribution suggests that moderate AI adoption may be more common than very high adoption.
2. Faster report preparation emerges as the highest-rated perceived benefit in the example.
3. Improved consistency and anomaly detection are also rated positively.
4. Stakeholder confidence receives a lower mean than several operational benefits, suggesting the importance of independent verification and credible disclosure.
5. Traceability and the explanation of assumptions emerge as areas where organisations could strengthen transparency.
6. The actual correlation analysis indicates positive relationships between AI-enabled reporting, disclosure quality, corporate transparency and stakeholder confidence.
7. The business-size comparison suggests that larger businesses may perceive greater benefits, although the difference is modest.
8. The actual regression results suggest that AI adoption, human oversight and data governance may jointly explain variation in perceived corporate transparency.
9. The analysis highlights the need to combine technological adoption with governance procedures, staff competence and reliable underlying records.

These statements should be rewritten after the actual survey has been completed and the statistical outputs verified.

SUGGESTIONS AND RECOMMENDATIONS

Adopt a structured AI-enabled ESG reporting system

Businesses should assess their current reporting processes and identify where automation can improve data collection, classification, validation and report preparation. Implementation should be phased according to organisational size, risk and reporting requirements.

Establish a common ESG data dictionary

Organisations should define each indicator clearly, including its unit of measurement, reporting boundary, calculation method, data owner and reporting frequency. Common definitions can reduce inconsistencies between departments and reporting periods.

Maintain human oversight

AI-generated disclosures should be reviewed by authorised finance, sustainability, compliance or governance professionals. Material statements should be traceable to source evidence, and responsibility for final approval should remain clearly assigned.

Strengthen data quality and audit trails

Businesses should maintain source documents, record changes to data, document estimation methods and preserve the history of material adjustments. Automated checks should flag missing information, unusual changes and potential duplication for investigation.

Use recognised reporting frameworks

Companies should identify the relevant reporting standards and regulatory obligations for their circumstances. GRI Standards can support impact-oriented sustainability reporting, while IFRS S1 and S2 address investor-focused sustainability and climate disclosures. Applicable Indian regulatory requirements, including SEBI's BRSR framework for entities within scope, should also be considered.

Improve staff skills

Training should cover ESG concepts, data analysis, AI limitations, privacy, cybersecurity, bias detection and responsible interpretation of automated outputs. Training should be provided to management as well as technical personnel.

Support SMEs with affordable solutions

SMEs may benefit from modular reporting software, shared training programmes, industry associations and professional consultancy. Low-cost implementation options can reduce the gap between organisations with advanced digital systems and businesses with limited resources.

Disclose limitations and estimates

Where ESG information involves estimation, incomplete supplier data or uncertainty, organisations should explain the methods and limitations. AI-generated estimates should not be presented as directly measured facts.

Protect confidential information

AI-enabled reporting systems should have appropriate access controls, data-retention policies, secure integrations and procedures for handling commercially sensitive or personal information. Organisations should understand how their data are processed by third-party tools.

Monitor greenwashing risks

AI can assist in checking inconsistencies between claims and supporting evidence, but it should not be treated as a substitute for verification. Sustainability claims should be proportionate, specific and supported by documented information.

Introduce periodic independent review

Businesses should periodically review reporting controls, source-data quality, algorithm performance and the consistency of published ESG disclosures. Independent assurance should be considered where appropriate or required.

Encourage sector-specific collaboration

Manufacturing, IT, finance and retail businesses have different sustainability risks. Sector associations and professional bodies can help develop practical indicators, training materials and common reporting practices suitable for businesses operating in Pune and Maharashtra.

LIMITATIONS OF THE STUDY

The study has several limitations.

- The geographical scope is limited to selected businesses in Pune City.
- A sample of 150 respondents may not represent all sectors, business sizes or organisational structures.
- Purposive sampling may introduce selection bias.
- A cross-sectional survey cannot establish definitive causal relationships.
- Self-reported perceptions may differ from the quality of actual published ESG disclosures.
- Respondents may have different levels of knowledge about AI and ESG reporting.
- The study does not automatically establish whether AI-generated information is objectively accurate.
- Technology, standards and regulatory expectations may change over time.

Future research could compare businesses across multiple Indian cities, analyse actual sustainability reports, use longitudinal data, or compare perceived transparency with independently verified disclosure quality.

CONCLUSION

AI-enabled ESG reporting represents a potential opportunity to strengthen corporate transparency by improving the collection, analysis, validation and communication of sustainability-related information. Its potential applications include automated document processing, anomaly detection, reporting dashboards and the integration of information from different organisational functions.

The proposed study focuses on selected businesses in Pune City, Maharashtra, using a sample of 150 respondents. It examines whether AI-enabled ESG reporting is associated with disclosure quality, corporate transparency and stakeholder confidence, while considering the roles of human oversight and data governance.

The analysis demonstrates how descriptive statistics, Pearson correlation, Welch's t-test and multiple regression can be used to investigate the proposed relationships. However, the numerical results are and cannot establish the actual position of businesses in Pune. Valid empirical conclusions require genuine survey responses, reliable measurement scales and correctly executed statistical tests.

The central proposition of this research is that AI should be treated as an enabling mechanism rather than a guarantee of transparency. Its contribution depends on the quality of source data, the appropriateness of reporting standards, the competence of employees, the explain ability of outputs and the strength of accountability mechanisms. Organisations should combine automation with human review, traceable evidence, responsible data management and appropriate independent verification.

In conclusion, AI-enabled ESG reporting can potentially support more consistent, timely and accessible corporate disclosures. Businesses in Pune and across India should therefore pursue responsible AI adoption alongside strong governance practices. Such an approach can help improve the credibility of sustainability information and support more informed decisions by investors, regulators, employees, customers and other stakeholders.

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