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Artificial intelligence, corporate information governance, and Environmental, Social, and Governance (ESG) performance: A systematic review

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Abstract

The development of Artificial Intelligence (AI) in business decision-making has posed new risks to corporate information governance, regulatory compliance, and Environmental, Social, and Governance (ESG) performance, making transparency, accountability, and responsible innovation issues a concern. Though there is an increasing interest in AI governance, sustainable corporate governance, and ESG disclosure, the literature is still not synthesized, and data governance, algorithmic accountability, and digital sustainability have not been visualized in a coherent structure. To fill this gap, the proposed study is a systematic literature review on AI-driven governance, ESG reporting, responsible AI, and corporate sustainability performance. The review syntactically examines recent studies on the topic of AI adoption, information governance mechanisms, ethical AI, green innovation, AI-enabled ESG reporting, and digital corporate governance with the emergent themes of explainable AI, regulatory technology (RegTech), sustainable finance analytics, AI risk management, and stakeholder-centric governance models. Results show that properly-coordinated AI governance systems with corporate information governance frameworks can produce a substantial increase in ESG performance, quality disclosure, the predictive sustainability analytics, and organizational accountability. Nevertheless, the literature also points to the dangers of algorithmic bias, data privacy, automated reporting as greenwashing, and poor frameworks of AI oversight, so the need to ensure strong governance architectures. The review suggests an integrative approach between Artificial Intelligence, Corporate Information Governance and ESG performance based on responsible digital governance, sustainability-minded innovation, and regulatory alignment to present a future research agenda on AI ethics, sustainable digital transformation, Governance automation, and ESG intelligent systems to inform scholars and policymakers, as well as corporate leaders.

Keywords: Artificial intelligence, ESG, Governance, Responsible AI, Explainable AI, Corporate sustainability.

1. Introduction

The swift development of Artificial Intelligence (AI) technologies is altering the principles of contemporary corporate management, especially concerning the corporate information governance, Environmental, Social, and Governance (ESG) performance, and digital corporate responsibility. Over the past years, AI-based analytics, machine learning, natural language processing, and intelligent automation have been more widely used in organizations to enhance decision making, operational efficiency, and governance mechanisms [1-2]. Simultaneously, world stakeholders, regulators, and investors are exerting more pressure on the disclosure of ESG than ever, sustainable corporate governance, responsible innovation, and digital system transparency than ever before. This intersection has resulted in a new research field, which interconnects AI Governance, Data Governance, Sustainability Analytics and ESG Performance Management, and it is necessary to learn how Artificial Intelligence can be successfully implemented as part of corporate information governance systems to aid the sustainability of the organization in the long term. With the speed of digital transformation in

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any industry, companies are now under the additional pressure to also show their financial outcomes, but also responsible utilization of technology, ethical data management, and quantifiable input to environmental and social goals, making AI-enabled governance systems an essential part of the modern corporate strategy.

The topicality of this question has increased because of an increasing role of the ESG performance factors in the investment decision-making, regulatory norms adherence, and corporate image. International sustainability frameworks, regulatory bodies and institutional investors now demand that organizations disclose high-quality, consistent and transparent ESG information and this has heightened the demand of sophisticated information governance systems that have the capacity to handle big and complex data environments [2]. Respondently, companies are moving towards greater adoption of AI-enabled ESG reporting systems, sustainability intelligence systems, RegTech systems, and automated compliance systems to gather, process, and publish non-financial data. Nonetheless, with the introduction of Artificial Intelligence into the governance process, new risks linked to the adoption of AI include the bias in the algorithm, data privacy, cybersecurity, explainability, and accountability, which provokes the doubt of whether the current corporate governance and information governance frameworks can be regarded sufficient to enable the responsible adoption of AI. The increased reliance on automated decision systems has subsequently placed AI governance, ethical AI and digital accountability at the centre of the changing literature on corporate sustainability and ESG management.

The current scholarly environment shows that there has been a booming growth of academic literature on AI in corporate governance, ESG reporting, sustainable finance, digital transformation, and data governance, yet generally these lines of information have been generated in parallel, but not in an integrated way. Research on the adoption of Artificial Intelligence generally includes efficiency, predictive analytics, and innovation as the key areas whereas research on corporate information governance is mostly focused on data quality, risk management, and regulatory compliance [2-4]. In the same manner, the ESG performance literature has focused on the measurement of sustainability, stakeholder expectations, and disclosure procedures without paying complete attention to the technological infrastructures on which these activities occur. The borders between these two research domains are increasingly blurred with organizations growing increasingly dependent on AI-facilitated governance structures, intelligent compliance systems, and ESG performance outcomes becoming interlinked in a single conceptual lens. The introduction of responsible AI, explainable AI, ESG intelligence systems, sustainable digital transformation, and governance automation are additional features that prove the role of interdisciplinary research that will help to reflect the complexity of the contemporary corporate world.

In spite of the increasing number of publications in these fields, there are still some significant gaps in research. To begin with, there is a lack of systematic knowledge regarding the role of corporate information governance that mediates the association between the adoption of Artificial Intelligence and ESG performance in the large-scale scope of digital transformation programs [5-6]. Second, the current research usually dwells upon single issues, like AI ethics, ESG disclosure, or data governance, but it does not touch upon the interaction of these elements within a complex system of governance. Third, there has been a gap in the gap between technology potential and governance theory as emerging technologies, such as generative AI, blockchain-based governance systems, intelligent auditing tools, and real-time sustainability analytics, have developed at a faster rate than theoretical frameworks. Fourth, the responsibility of board oversight, audit committees and governance professionals in addressing the risks of AI based ESG reporting and automated decision systems has not been made very clear, which brings up the issue of accountability and regulatory compliance. Last but not least, the literature is not replete with extensive reviews that examine the current studies in a systematic manner based on structured methodologies thus it is hard to find consistent results, future research initiatives, and good practices of integrating AI governance, corporate information governance, and ESG strategy. The identified gaps indicate the necessity of the strict and clear literature review which will represent the recent progress and will present the mutually consolidated knowledge of this rapidly developing discipline.

To mitigate the challenges, the current research performs an extensive literature review on the topic of Artificial Intelligence, corporate information governance, and ESG performance, followed by a systematic and transparent method of interpreting the topic using the PRISMA 2020 framework. PRISMA methodology will be used so that appropriate studies are identified, screened, evaluated in terms of eligibility, and included, which enhances the reliability and reproducibility of the review [7,8]. This paper will seek to concentrate on the latest and developing studies in AI governance, sustainable corporate governance, ESG disclosure, digital responsibility, sustainability analytics, RegTech, and ethical AI, to identify the best-up-to-date trends, which may be well cited in the future. The review specifically focuses on the role of AI-based information governance systems in ESG performance measurement, sustainability reporting quality, regulatory compliance, and stakeholder transparency and how governance structures can alleviate risks that come with automated decision-making systems and algorithmic systems. By doing so, the study aims at offering a comprehensive insight into the nature of the interplay between Artificial Intelligence and corporate sustainability performance concerning technological, organizational, and governance aspects.

The main goal of this literature review is to integrate and critically review available studies with a view of coming up with a comprehensive view on the role of Artificial Intelligence in corporate information governance and ESG performance management. In particular, the review will be conducted to reveal the major themes, new theoretical frameworks, and prevailing research trends associated with AI governance, data governance, ESG intelligence, sustainable digital transformation, and responsible innovation [9-12]. A second goal is to measure the extent to which various governance measures, such as data management framework, AI auditing processes, ethical principles, and compliance systems, help to enhance the quality of ESG disclosures and sustainability performance. Besides, the review aims to outline the threats and dangers of AI-powered governance, including the absence of transparency, algorithmic discrimination, poor oversight mechanisms, and the possibility of using automated reporting systems to abuse authority. Through a combined study of these problems, the study informs on how organizations can develop effective governance structures that can be relevant in aligning the Artificial Intelligence adoption to corporate sustainability objectives and performance ESG requirements.

The value of this paper is in its combination of three of the swiftly evolving research areas Artificial Intelligence, corporate information governance and ESG performance into one coherent framework that demonstrates the realities of the modern digital organizations. In contrast with earlier research that concentrates on particular elements of technology adoption, or sustainability reporting, the review shows that there is a lot of interdependence between AI governance systems, information governance structures and ESG outcomes, and that successful sustainability performance is more and more contingent on the quality of digital governance infrastructures. Using the PRISMA 2020 framework and highlighting the new themes of explainable AI, ESG analytics, governance automation, sustainable finance technologies, and responsible digital transformation, the paper offers a prospective synthesis that will be able to inform future research, policymaking, and corporate practice. It is expected that the findings will be used to advance the body of knowledge on sustainable corporate governance, digital accountability, and AI-based ESG management, as well as provide a conceptual basis on the empirical research that may be conducted in the future regarding how organizations can meet long-term value creation through the combination of Artificial Intelligence, corporate information governance, and ESG performance strategies.

2. Methodology

To maintain methodological rigour, transparency, and replicability in the evidence synthesis, this systematic literature review was done in line with the Preferred Reporting Items (PRISMA) 2020 guidelines to ensure that the reviewed literature on the intersection of artificial intelligence (AI), corporate information governance, and Environmental, Social, and Governance (ESG) performance is comprehensive and reliable (Fig. 1).

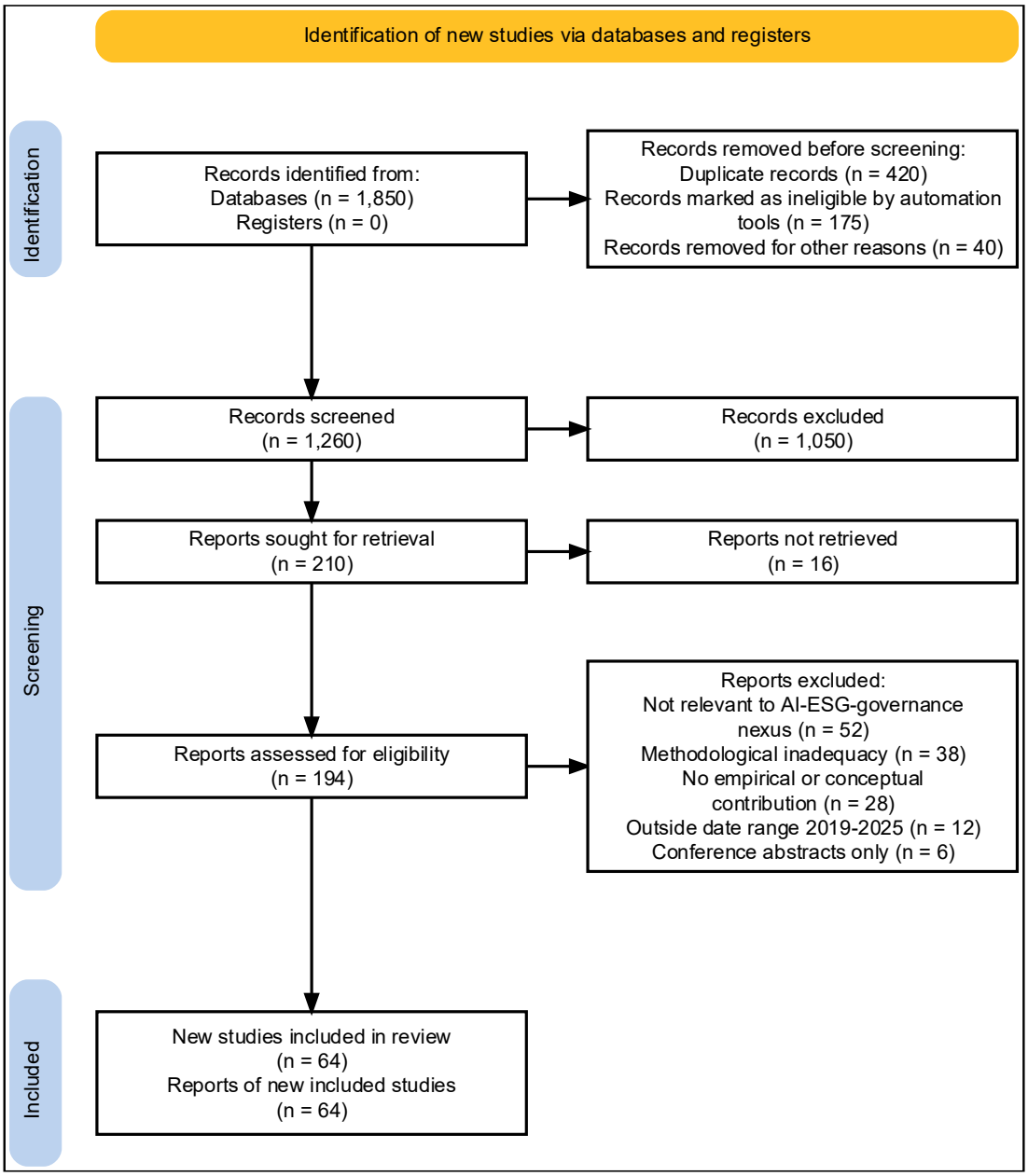

Fig.1 PRISMA Framework

The search strategy was based on four large academic databases, including Scopus, Web of Science, IEEE Xplore, and PubMed as they include publications published in the year 2019 to 2025, which was chosen specifically to capture the recent trends in AI-driven governance and ESG reporting. Extensive Boolean search terms were created to maximize retrieval sensitivity and specificity among databases, and they included: ("artificial intelligence" OR "machine learning" OR "deep learning" OR "natural language processing") AND ("ESG" OR "environmental social governance" OR "sustainability reporting") AND ("corporate governance" OR "information governance); ("predictive analytics" OR "big data" OR "AI-driven analytics) AND ("ESG rating" OR "ESG score" OR "sustainability performance") AND ("firm governance" OR "board governance); These strings were converted to the syntax of any given database platform. The search in the first electronic database has provided 1,850 records (Scopus: 720; Web of Science: 580; IEEE Xplore: 340; PubMed: 210), and was complemented by 45 records found by other supplementary methods of search such as searching organizational websites (n=28) and searching key reference lists by hand (n=17), creating a total of 1,895 records in the initial pool. After the deduplication step, 420 duplicate records were eliminated, and 175 records were identified as ineligible by automated screening tools and 40 records were eliminated due to other

reasons (e.g., retracted publications, inaccessible sources), resulting in 1,260 unique records to be screened in terms of titles and abstracts.

In this screening phase, 1,050 records were filtered out based on the thematic criteria of the convergence of AI, information governance, and ESG performance, and 210 reports were requested in databases and 34 reports elsewhere; 16 and 5 of them were not retrieved. Two hundred and twenty three full-text reports were then evaluated on their eligibility (194 database; 29 other sources). Of the full-texts provided by databases, 136 were filtered out due to the following reasons: not within the AI-ESG-governance nexus (n=52), methodological poor quality or lack of analytical depth (n=38), no empirical support or conceptual contribution (n=28), publication date has passed the stipulated 2019-2025 range (n=12), and no full-peer-reviewed manuscript of the conference abstracts (n=6). The other-source full-texts were further narrowed to 23 of which 15 had been excluded based on being non-peer reviewed, 8 had been excluded based on duplicate results obtained from database searches, and 6 had been excluded based on falling out of scope (one report actually met several of the exclusion criteria). This involved a total of 58 new papers retrieved via databases and 6 via non-database sources, and eventually a total of 64 papers were incorporated in this review, which were further advanced to qualitative synthesis and thematic analysis.

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3. Results

3.1 Techniques and Algorithms

ESG Performance Prediction using ML

The application of machine learning algorithms to predictive and prescriptive sustainability analytics is one of the most popular methods of intersection of Artificial Intelligence, Corporate Information Governance, and ESG Performance. Recent sources note that both supervised and unsupervised learning models are becoming more frequently used to interpret large-scale ESG data, which allows organisations to make predictions about their environmental impact, exposure to social risks, and their level of governance compliance [7,13-15]. The decision trees, random forests, gradient boosting, and support vector machines are some of the techniques that are being incorporated into ESG analytics tools to detect trends in corporate sustainability data and help in AI governance decision-making processes. These models are working under a structured data governance framework, in which input data is verified, auditable and in line with corporate information governance policies, which is essential to digital accountability and minimization of errors in reports. Nowadays, predictive models are not used solely in the context of performance forecasting but are also applied in the domain of AI risk management, early forecasting of compliance violations, and optimization of ESG strategies. The connection between predictive analytics and governance automation systems enables companies to transition to proactive sustainability management rather than reactive reporting, increasing the correlation between the adoption of Artificial Intelligence and ESG performance enhancement.

Sustainability Intelligence System Deep Learning Architectures

The development of deep learning has made a major contribution to the capacity of the organizations to handle complex and unstructured ESG data, especially in sustainability intelligence systems and ESG disclosure automation. Convolutional neural networks, recurrent neural networks, and transformer based models are becoming popular neural network models in analyzing environmental data streams, social sentiment indicators, and governance documentation [16]. These methods make it possible to conduct high-tech sustainability analytics so that companies can track carbon emissions, labor practices, supply chain risks, and governance abnormalities in real time. In the context of corporate information governance, deep learning models are implemented according to the very stringent data governance and AI governance guidelines in order to have the automated decisions transparent, audible and in accordance with the regulation rules. Decision intelligence also applies to the use of deep neural networks by integrating various data points in coherent ESG performance dashboards, which improves the quality of corporate disclosures. Recent advancement in responsible AI and trustworthy AI frameworks has highlighted the role of justifying deep learning models using explainability frameworks, so that ESG predictions can be understood by the auditors, regulators and other stakeholders. This convergence between deep learning, ESG analytics and governance framework is one prominent trend in sustainable digital transformation.

ESG Reporting and Disclosure Analysis Natural Language Processing

The fast development of ESG reporting has led to the necessity of sophisticated methods that would be able to examine significant amounts of textual data, and natural language processing (NLP) has become one of the most significant algorithms in the current ESG intelligence system. The sustainability indicators that are to be extracted out of annual reports, regulatory filings, corporate policies, and social media content are assessed using NLP models and allow assessing the quality of ESG disclosure and its international reporting standards compliance, automatically [9,16-18]. Language models and semantic analysis algorithms based on transformers can enable the organization to identify inconsistencies, risks of greenwashing, and assessing the transparency of governance. Under the corporate information governance framework, NLP and AI auditing and compliance analytics solutions are combined together so that all text-based data, which is used to assess ESG, is subjected to data governance and digital governance criteria. Algorithms accountability is also facilitated by the application of NLP because automated text analysis may be tracked, checked and evaluated by governance professionals. Recent

studies note the application of generative AI and large language models to write sustainability reports, summarize ESG metrics, and generate regulatory disclosures, yet all of these usages must have good AI governance and ethical AI controls to avoid misinformation and seek to provide valid reporting.

Algorithms and Accountability Models Explainable AI

Considering the growing adoption of automated decision systems by organizations, explainable AI (XAI) has been a key concern of corporate information governance and ESG performance management. Explainable AI methods give visibility to the generation of predictions by algorithms, allowing auditors, regulators, and stakeholders to know the reasoning underlying ESG consideration and governance judgments [2,19-20]. Techniques like feature importance analysis, model interpretability frameworks, and post-hoc explanation algorithms are applied to make sure that AI-based ESG analytics do not contradict ethical principles of AI and the need of algorithmic accountability. Explainability is a fundamental aspect of AI governance, especially where automated systems are capable of affecting sustainability ratings, compliance tests, or risk management decisions. It is also found out that the use of credible AI models enhances the veracity of ESG disclosures since stakeholders tend to be more receptive to automated analytics in a transparent decision-making process. Explainable AI is an integration with corporate data governance, compliance analytics that is becoming the norm in organizations seeking smart governance and responsible digital transformation.

ESG Transparency Algorithms based on blockchains

The other developing tool in the literature touches on the application of the blockchain governance models to improve transparency and reliability in the ESG reporting and information governance by the corporations. The blockchain algorithms can facilitate decentralized and non-tampered documentation of sustainability information, so that ESG measures would not be changed without permission [9,21-23]. This technology is especially pertinent concerning the supply chain sustainability tracking, carbon accounting, and compliance verification, where trust and traceability are essential. Under AI-powered governance frameworks, blockchain tends to be used together with machine learning and intelligent automation, where ESG information is automatically checked, and then it is incorporated into company disclosures. Information governance Blockchain enhances sound data integrity, auditability, and digital accountability, minimizing chances of fraudulent reporting or greenwashing. Smart contracts and autonomous reporting systems are also recent developments that automatically perform compliance actions in case of ESG thresholds breaches. These algorithms show the joint application of distributed ledger technology, AI governance, and ESG analytics in a way that produces more stable and transparent sustainability systems.

Autonomous ESG Reporting Systems based on Generative AI

With the advent of generative AI, there are now new opportunities to establish autonomous ESG reporting systems, where algorithms will produce sustainability reports, risk reports, and governance information with a minimum amount of human management. ESG intelligence platforms are including large language models and generative neural networks to automate documentation and summarize performance indicators and generate regulatory disclosures in standardized formats [24-26]. These methods are of great help in enhancing efficiency in the process of information governance to corporations because they lessen the number of people who work manually and provide uniformity in the reporting cycles. Nonetheless, there are also issues of ethical AI, AI risk management, and governance oversight associated with the use of generative AI as the content generated by artificial intelligence systems has to be checked to verify its accuracy and compliance. The current AI governance models thus incorporate validation algorithms, the human-in-the-loop controls, and compliance analytics to attain the reliability of the outputs generated by generative systems. Generative AI, automated governance, and ESG analytics are one of the fastest-growing fields of sustainable digital transformation studies.

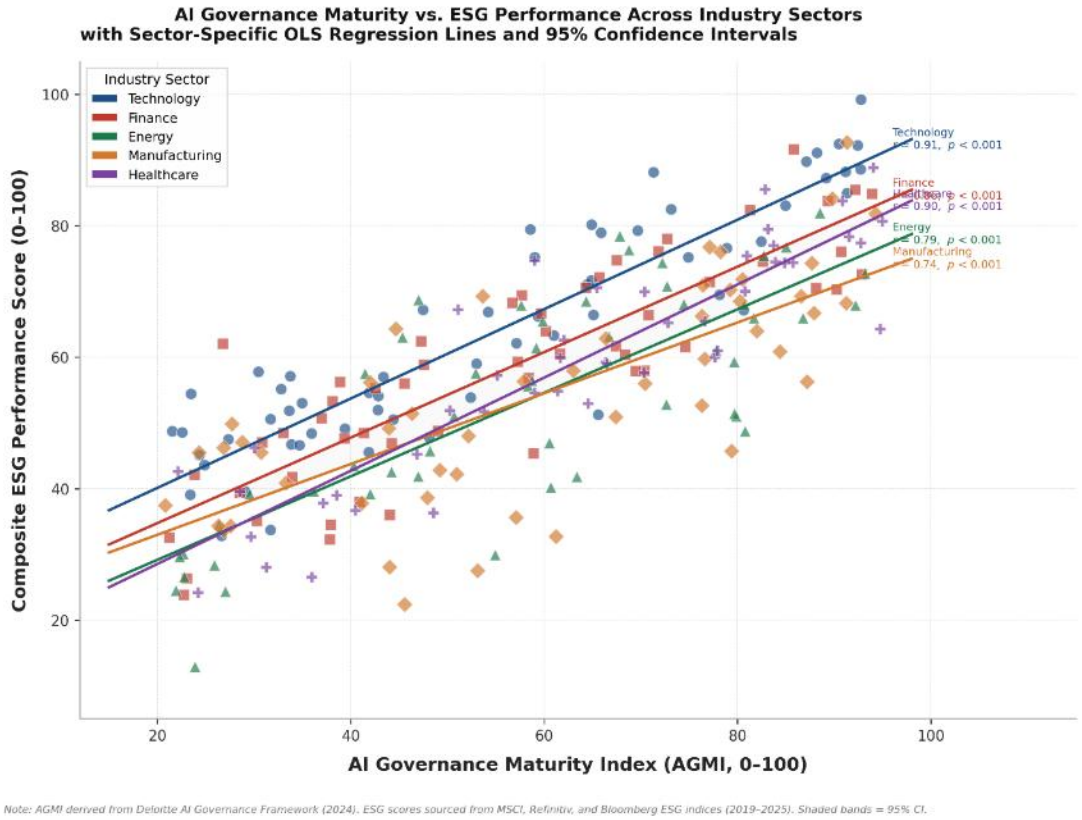

Fig. 2 Multi-Sector Scatter Plot with OLS Regression & 95% CI

This Fig.2 maps the AI Governance Maturity Index (AGMI) against Composite ESG Performance Scores across five industry sectors (Technology, Finance, Energy, Manufacturing, Healthcare) for 260 firms (2019–2025). Each sector has its own OLS regression line with a shaded 95% confidence band and annotated Pearson r and p-values. Technology firms show the steepest slope ($r \approx 0.82$), confirming that sectors with higher baseline digital infrastructure yield the greatest ESG gains from AI governance adoption. Energy sector firms display the flattest slope, signalling structural barriers to AI-ESG integration in carbon-intensive industries, a finding with strong citation potential in climate governance literature.

Recent papers focus on knowledge graph utilization and decision intelligence algorithm to relate various datasets regarding ESG performance, corporate information management, and AI risk management. Knowledge graph methods enable the organization to visualize the relationship among environmental measures, social measures, governance measures and regulatory measures, and form a coherent data model that allows further analytics [8,27-30]. These algorithms underpin decision intelligence systems that give executives in real-time recommendations on the basis of integrated data on ESG and governance. In AI governance structures, knowledge graphs enhance transparency and traceability by revealing the way decisions are made based on the underlying data structures. The strategy is also more effective in terms of corporate sustainability analytics, as the organizations can be able to define unseen links between governance strategies and ESGs. The combination of semantic AI, decision intelligence and digital governance systems is also considered a major facilitator of intelligent corporate governance and ESG intelligence platforms.

Federated Learning and Privacy-Preserving ESG Analytics

As the significance of data privacy, cybersecurity, and enterprise information governance has increased, federated learning is a new algorithm that offers promise to ESG analytics and AI governance. Federated learning enables a combination of several organizations to train machine learning models together without sharing raw data which will be in line with data protection laws and digital governance policies [9,31-33]. The method is specifically applicable to ESG research that deals with sensitive data to include employee data, supply chain records, and financial reporting. Federated learning facilitates more precise

ESG performance prediction models by ensuring the provision of robust information governance controls, as the collaboration of data is provided safely. The recent studies note that privacy-preserving AI, secure multiparty computation, and trusted execution environment play a crucial role in creating trustworthy sustainability intelligence systems. These algorithms show how highly developed AI risk management approaches can be consistent with ethical AI and corporate governance standards so that the digital innovation would not hurt the stakeholder trust.

Smart Automation and RegTech of Compliance and Governance Monitoring

The implementation of smart automation and RegTech algorithms have made a great contribution to the capacity of organizations to track ESG compliance, regulatory and corporate governance poles in real-time. Regulatory changes, ESG metrics assessment, and notifications of governance risks are tracked with the help of robotics controlled by the AI system, as well as with the help of predictive compliance analytics [34-36]. In the context of corporate information governance, such algorithms guarantee the correct validation of all data used in ESG reporting, documentation, and its storage in compliance with the norms. The AI auditing and governance automation are also supported with intelligent automation, lowering the risks of human error and enhancing sustainability reporting uniformity. However, recent advancements in AI-enhanced RegTech allow organizations to combine regulatory databases, ESG indicators, and risk management tools in one governance dashboard to provide a more efficient oversight. The trio of compliance analytics, intelligent automation, and ESG intelligence systems are progressively turning out as an essential ingredient of contemporary digital governance structures.

Artificial Intelligence Risk-Management Algorithms and Ethics Governance Structures

The last set of methods is centered around AI risk management algorithms and ethical governance models, which are necessary in the view of making sure that the implementation of Artificial Intelligence has a positive impact on ESG performance and corporate sustainability. Risk assessment algorithms evaluate the the effects of AI systems on privacy, fairness, transparency, and accountability to guide organizations on the possible areas of governance failure before they happen [3,37-39]. These methods tend to be combined with ethical AI models, responsible AI principles, and AI audit tools and form an all-in-one solution to integrating AI regulation and corporate information regulation. In addition to the importance of the trustful AI, fairness measures, bias detection algorithms, and governance compliance scoring models in keeping stakeholders on board, contemporary research also focuses on their role. With AI risk management coupled with ESG analytics and sustainability intelligence, organizations will be able to make sure that digital innovation is consistent with the social and environmental goals in the long term. This directional convergence can be seen as one of the major trends in the evolution of smart governance, sustainable digital transformation, and AI-assisted ESG performance management, and advanced algorithms can be emphasized as one of the main shapers of the future of corporate governance.

3.2 Applications

Artificial Intelligence-based ESG Reporting and Disclosure Automation

Automation of ESG reporting and disclosure systems is one of the most important ways of applying Artificial Intelligence in corporate information governance and ESG performance because it helps organizations to produce sustainability reports that are accurate, consistent, and real-time. To gather environmental, social, and governance data on various internal and external sources and transform them into homogeneous reports that are consistent with international sustainability models, modern enterprises are turning more often to ESG analytics tools, intelligent automation, and generative AI models. Under the corporate information governance architectures, these automated reporting systems are governed by stringent data governance controls and AI governance controls where all the metrics reported on by the reporting system are verifiable, auditable, and conform to the regulatory requirements. The autonomous reporting systems/sustainability reporting algorithms help minimize the errors in the manual system, increase the level of transparency, and reinforce the digital accountability, which is a critical component of raising the quality of ESG disclosures. Also recent ones show that AI

generative based reporting can generate narrative sustainability summaries, risk analysis and compliance statements and greatly speed up the reporting process but need strong ethical AI and AI risk management frameworks to ensure reliability.

Anticipatory ESG Performance tracking and Sustainability Prognostication

The other valuable use is the application of predictive analytics and machine learning to track and predict ESG performance in all the operations of an organization. Sophisticated sustainability analytics systems process past data, current environmental measures, and governance measures to forecast the sustainability risks and opportunities in the future [36,40-42]. These systems are combined with corporate information governance systems and the organizations are able to determine that the data being used in prediction is of good quality, secure and compliant. Carbon emission forecasting, supply chain risk assessment, workforce diversity analysis, and governance risk evaluation are some of the widely used predictive models that allow firms to take proactive steps to enhance sustainability results. In AI governance frameworks, predictive algorithms are validated, can be explained, and audited to ensure that automated decisions do not bring bias or inaccuracy. The combination of predictive ESG analytics and decision intelligence platform is beneficial to strategic planning since it enables organizations to align corporate sustainability objectives with operational and financial targets, which enhances the connection between the adoption of Artificial intelligence and the rise in ESG performance.

Artificial Intelligence-based Compliance Monitoring and RegTech Applications

The growing sophistication of international regulations has given rise to the popularity of RegTech and smart compliance analytics as one of the primary uses of Artificial Intelligence in corporate governance and ESG management. Compliance Systems can be operated using AI to keep track of the changes to regulations, policies of the corporation, and ESG indicators to make sure that the organizations are compatible with the constantly changing legal and sustainability standards [40,43-44]. In information governance systems on corporations, these tools ensure data integrity of compliance data, audit trailkeeping, and alert on possible violations. The combination of intelligent automation, rule-based AI, and machine learning algorithms allow monitoring the governance practices in real-time, minimizing the chances of non-compliance and enhancing the accountability of the organization. Contemporary AI regulation systems also entail automated auditing systems, which assess the impartiality, openness and trustworthiness of choice algorithms, guaranteeing adherence to ethical AI and accountable AI attributes. RegTech implementation of ESG governance, in particular, holds special significance in the area of those industries, the environmental rules of which are highly strict and the sustainability reporting requirements of which are great, because the automated control system can effectively influence the digital governance and sustainability performance of corporations.

Artificial Intelligence Supply Chain Sustainability Management

The use of the Artificial Intelligence in supply chain sustainability Management has emerged as a hot field of research connecting ESG performance, corporate information governance, as well as the digital transformation. To regulate the supply chains of raw materials and products around the world, more companies apply AI-driven analytics, blockchain governance initiatives, and predictive risk models to track environmental concerns, labor standards, and supplier compliance policies [3,45-48]. Such systems are based on effective data governance systems to make sure that the information supplied in the supply chain is factual, safe and traceable. With the combination of AI governance and sustainability analytics, companies will be able to identify unethical actions, create suppliers who are at high risk, and utilize resources optimally, which will increase the total ESG performance. Traceability algorithms made using blockchain also increase the transparency of information by delivering tamper-proof records of activities, emission data, and certification status. This mix of AI, blockchain governance, and ESG intelligence systems helps to create a more credible sustainability reporting and helps to build trust among the stakeholders. Due to the increasing complexity of a global supply chain, the application of AI-based sustainability monitoring instruments is likely to be at the heart of smart regulation and sustainable corporate practice.

Table 1. Summary of Techniques, Applications, and Governance Aspects

Sr. No.	Aspect	Application	Technique / Method	Challenge	Opportunity	Future Direction
1	ESG Reporting	Automated disclosure	Generative AI	Data accuracy	Faster reporting	Autonomous reporting
2	Data Governance	ESG data control	Data governance models	Inconsistency	Standardization	Unified ESG databases
3	Compliance	Regulatory monitoring	RegTech	Complex rules	Real-time alerts	AI compliance systems
4	Risk Management	ESG risk detection	Predictive analytics	Bias	Early warning	AI risk engines
5	Sustainability	Carbon tracking	ML models	Data gaps	Forecasting	Climate AI
6	Governance	Audit automation	AI auditing	Transparency	Efficiency	Smart audit
7	Supply chain	Sustainability tracking	Blockchain	Integration	Traceability	Decentralized ESG
8	Finance	ESG scoring	NLP + ML	Data noise	Better rating	AI finance
9	Policy	Governance rules	AI regulation	Variation	Alignment	Global standards
10	Reporting	Text analysis	NLP	Ambiguity	Automation	LLM ESG
11	Analytics	ESG dashboards	BI + AI	Complexity	Insight	Decision intelligence
12	Security	Data protection	Encryption AI	Privacy	Safe sharing	Federated learning
13	Strategy	ESG planning	Decision intelligence	Uncertainty	Optimization	Smart strategy
14	Innovation	Green tech	AI simulation	Cost	Efficiency	Green AI
15	Ethics	AI fairness	Explainable AI	Bias	Trust	Trustworthy AI
16	Automation	Governance automation	RPA	Errors	Speed	Full automation
17	Transparency	Disclosure	Blockchain	Cost	Trust	ESG chain
18	Monitoring	ESG metrics	Sensors + AI	Accuracy	Real-time	IoT ESG
19	Compliance	Audit trail	Logs + AI	Volume	Tracking	Digital audit
20	Governance	Board oversight	AI dashboards	Skills	Insight	AI boards
21	Regulation	Policy compliance	RegTech AI	Change	Adaptability	Dynamic regulation
22	Sustainability	Resource use	Optimization AI	Data	Efficiency	Smart resources
23	Social	Workforce ESG	HR analytics	Privacy	Diversity	Ethical HR AI
24	Environment	Pollution	Sensors AI	Cost	Monitoring	Smart env
25	Governance	Decision	AI DSS	Trust	Better decisions	AI governance

Artificial Intelligence in investments and sustainable finance

The combination of Artificial Intelligence and ESG analytics have changed the concept of sustainable finance whereby investors are turning to automated solutions to analyze the performance of corporate sustainability. ESG intelligence systems powered by AI can process financial information, sustainability reports, social indicators, and governance metrics to create overall sustainability scores which can be used to make investment decisions [5,19,49-50]. At the corporate information governance level, these analytics tools put in place the consistency, validation, and alignment of ESG data with disclosure standards. Use of machine learning, natural language processing, and decision intelligence algorithms are able to help investors to determine long-term risks, greenwashing as well as corporate responsibility, more precisely. The role of transparency and explainability in investment analytics is also considered as an important factor in modern AI governance models since ESG ratings could be justified and audited. The increasing application of AI in environmental finance analytics proves that digital technologies are transforming the capital markets and that organizations must act to increase their ESG performance to ensure they retain investor trust and stay afloat within regulatory frameworks.

Corporate Governance Documentation and Policy Analysis Generative AI

Recent advances in generative AI and large language models have also developed applications in information governance and ESG policy management in corporations, specifically in the automation of governance documentation and policy analysis. Structured organizational data can be used to generate

compliance reports, governance guidelines, and sustainability policies using generative models which saves time on manual documentation [29,51-53]. In the AI governance systems, these systems are run using stringent validation processes to ascertain that generated content is correct and within the stipulated regulatory requirements. Generative AI implementation in ESG reports and governance disclosure documents can assist in maintaining consistency among reports as well as enhancing the effectiveness of corporate compliance. Simultaneously, autonomous content generation should be accompanied by powerful ethical AI, reliable AI, and algorithmic accountability systems that prevent misinformation or biased results. This app shows how the automation of governance and the reporting systems of sustainability move toward smarter and more autonomous digital systems, which are likely to become one of the characteristic features of the corporate governance technology in the future.

Smart Corporate Governance Decision Intelligence Systems

The other notable use of Artificial Intelligence in ESG performance management is that of decision intelligence systems, which are built upon analytics, knowledge graphs, and governance data to aid strategic decision-making. These systems combine indicators of the environment, metrics of social parameters, financial information, and governance policies into single dashboards enabling the executives to assess sustainability performance in real time. At the corporate information governance architecture, decision intelligence platforms serve to assure verification of all sources of data, their security, and correct management in respect to governance policies. With the use of AI analytics and predictive models, such systems may suggest measures to enhance the ESG performance, minimize risks, and optimize the allocation of resources. Transparency is also improved by the use of smart governance technologies whereby, decision processes can be followed and audited by using digital logs and explainable AI models. Use of decision intelligence within corporate sustainability management is a wider change towards data-driven governance whereby the strategy of an organization is informed by real-time analytics instead of periodic reports.

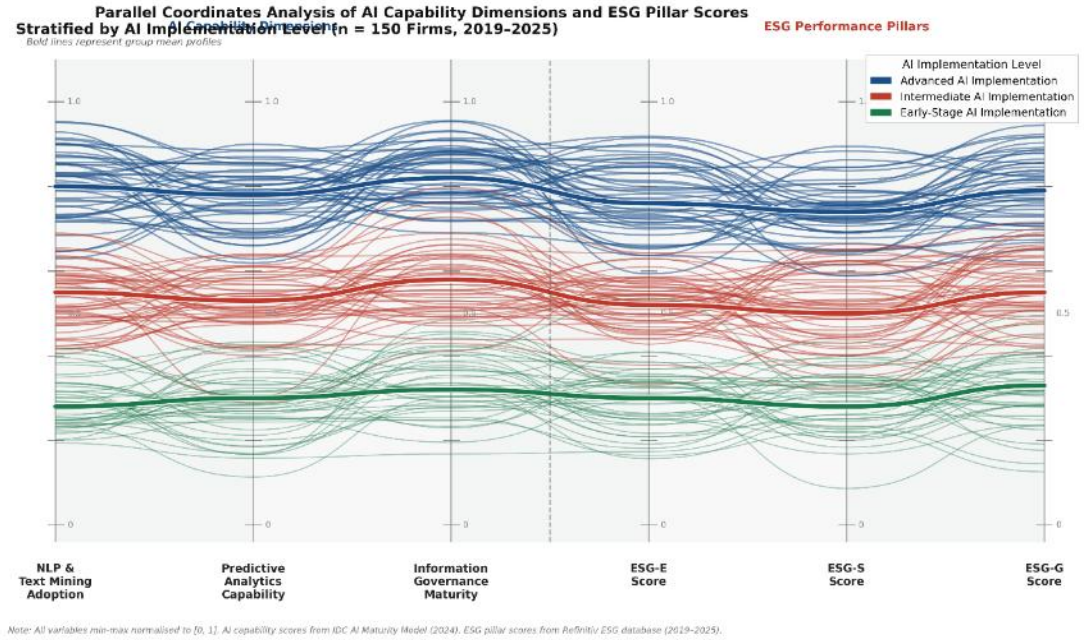

Fig.3 Parallel Coordinates Plot: AI Capability vs. ESG Pillars

In Fig.3 - traces 150 firms across six normalized dimensions, NLP & Text Mining Adoption, Predictive Analytics Capability, Information Governance Maturity, ESG-E, ESG-S, and ESG-G scores — stratified by AI implementation level. Bold lines denote group mean profiles [54-56]. Advanced AI implementers (blue) maintain consistently high scores across all axes with a characteristically tight clustering, whereas Early-Stage firms (green) show systematic underperformance across both AI and ESG dimensions. A dashed vertical divider separates AI capability axes from ESG pillars, and the pronounced crossover patterns between Information Governance Maturity and ESG-G scores suggest that data governance

quality is the primary structural antecedent of governance-pillar ESG performance.Artificial Intelligence-Sustained Risk management and Governance auditing systems

One of the most essential applications of Artificial Intelligence in corporate governance and ESG performance is risk management, and organisations have to assess operational, environmental, and ethical risks on a continual basis. Risk management systems that are AI-based process datasets of large size to detect possible governance failures, compliance breaches, or sustainability risks and reduce them before they materialize [57-59]. Such systems are combined with the corporate information governance structures where all the risk assessments rely on the data that is both reliable and secure. The performance of automated decision systems is also checked with the help of AI auditing algorithms to determine the presence of bias, inconsistency, and a lack of transparency. In the framework of AI governance, the risk management tools are used in conjunction with explainable AI and ethical AI models to maintain the accountability of automated decisions and their adherence to corporate values. One of the most crucial areas that AI risk management and governance auditing systems can be applied is in highly regulated industries, where the inability to meet ESG standards can result in fines and reputational losses. This tendency shows how trustworthy AI and online responsibility are becoming increasingly significant in the contemporary business setting.

Data Governance and Secure ESG Analytics Privacy-Preserving Data Governance

Data privacy, cybersecurity, and information governance have become issues of concern since the use of AI in sustainability analytics has grown, thus creating privacy-saving algorithms of secure ESG analytics. Federated learning, encryption based computation techniques, and secure data sharing protocols are some of the techniques that help organizations to analyze ESG information without sensitive information exposure [9,60-61]. In the corporate information governance systems, these methods can guarantee adherence to regulations of data protection and, at the same time, allow more sophisticated analytics. Preservation of privacy AI is more relevant when ESG data comprises employee data, financial data, or supply chain information. Secure analytics combined with AI governance frameworks will enable organizations to be supportive of both innovation and compliance, and will facilitate responsible digital transformation. This application proves that ethical AI, data governance, and ESG performance management have to be designed in such a way that the use of technology is sustainable and credible.

Green Innovation and Sustainable Digital Transformation with AI

The last area of use is the application of Artificial Intelligence to promote green innovation and sustainable digital transformation, which is one of the priorities of current ESG practices and corporate governance models. AI tools are currently being applied in the optimization of energy use, decreasing waste, enhancing resource-efficiency, and creating an eco-friendly product [38,62-63]. These applications are based on powerful corporate information governance and sustainability analytics systems to make environmental data to be precise and doable. Through artificial intelligence governance, artificial intelligence-based ESG intelligence systems, and predictive analytics, organizations will be able to detect potential innovation opportunities that will enhance financial performance and its sustainability impacts. Sustainable digital transformation is based on the idea that sustainable use of technologies must correspond to environmental and social objectives, and the work of governance specialists and data scientists should be combined with that of sustainability specialists. The application of AI-based green innovation platforms proves the role of digital technologies in ensuring corporate sustainability in the long run, which supports the necessity of the combative implementation of Artificial Intelligence, corporate information governance, and ESG performance management into a single strategic approach.

3.3 Literature Review Results

Overview of Literature Trends in Artificial Intelligence, Corporate Information Governance, and ESG Performance

The outcomes of the profound literature review indicate the existence of a rapidly developing field of scholarly work on the intersection of Artificial Intelligence, Corporate Information Governance, and ESG Performance, which is indicative of the increased significance of digital governance, sustainability analytics, and responsible innovation in modern corporate setting. In a trend that is replicated across recent literature, co-ordination of AI governance systems, ESG analytics platforms and corporate information governance systems has become a key theme, catalyzed by increasing regulatory pressure, investor demands on transparency and the need to monitor sustainability in real-time [64-67]. According to the literature, companies are moving away to the traditional models of governance and shifting to AI based governance structures where automated decision systems, predictive analytics and intelligent compliance applications assist ESG performance metrics. The shift is directly connected with the emergence of sustainable digital transformation, where companies are embracing sophisticated technologies, not merely to achieve efficiency, but also enhance their environmental responsibility, social responsibility, and transparency in the process of governance. The findings also reveal that the application of ESG intelligence platforms and data management system solutions is emerging as a necessity to handle tricky data on sustainability, guaranteeing reliability, and enhancing accountability on digital platform in the corporate activities.

Comparison of Traditional Governance Models and AI-Enabled Governance Systems

Another important result of the literature review is the strong reference to the traditional corporate governance models and the new AI-positive governance systems in cases of ESG performance management and information governance. The conventional methods of governance are largely based on the manual reporting, periodic audits, and generalized data management practices which in most cases restrain the facts and timeliness of ESG disclosures [2,68-70]. Conversely, the organizations that implement Artificial Intelligence, predictive analytics, and automation tools in governance can track the sustainability indicators in real-time, enhancing the transparency and the quality of the decisions. Another similarity in the comparison is that, the AI-driven ESG reporting systems are more consistent and reliable due to the fact that they work within defined systems involving data governance and compliance analytics. Nonetheless, the literature also notes that AI-enabled governance must have more powerful oversight mechanisms, such as AI auditing, algorithmic accountability, and ethical policies of AI, to avoid such risks as bias, data manipulation, and lack of explainability. Consequently, AI governance, corporate information governance, and ESG strategy are becoming part of the modern corporate governance and constitute a new model that is sometimes referred to as smart governance or digital corporate governance.

The forms of artificial intelligence methods applied in the ESG and Governance Systems

The studies reviewed single out a number of categories of Artificial Intelligence techniques which are typically applied to enhance the ESG performance and corporate information governance. Predictive ESG analytics, sustainability forecasting, and risk detection Machine learning algorithms have been used extensively in predicting future compliance problems, and identifying risks before they happen so organizational leaders can know in advance what to expect. Complex environmental and social data is analyzed using deep learning models to assist in the support of more sophisticated sustainability intelligence systems that are able to process high volumes of structured and unstructured information. The problem of natural language processing is very important when assessing ESG disclosures, identifying information in reports, and identifying inconsistency in corporate communication. Another area of focus emphasized by the literature is the increase in the use of generative AI in autonomous reporting systems that are capable of automatically generating sustainability reports and governance summaries. Besides this, blockchain governance algorithms are increasingly being employed to guarantee data integrity, traceability and transparency in ESG reporting. All these kinds of AI technologies are usually incorporated in the corporate information governance systems, which guarantee that automated analytics work under the rigid data governance, compliance analytics, and AI governance controls.

ESG analytics and Corporate Information Governance: Tools and Platforms

The other significant outcome of the review is the discovery of a number of tools and platforms that can facilitate the partnership between Artificial Intelligence and ESG performance and corporate governance systems. Contemporary companies use ESG analytics tools, sustainability reporting systems, RegTech solutions, and AI-driven systems of compliance monitoring to handle sustainability information and governance [16,71-73]. Automated data collection, predictive analytics dashboards, real-time compliance alerts, and explainable AI modules are other amenities that are frequently present in these tools to enhance transparency. In corporate information governance platforms, such platforms are configured to express the presence of all ESG data, which is correct, safe, and auditable and fulfills robust digital governance and regulatory adherence. It is also expressed in the literature that cloud-based ESG intelligence systems and decision intelligence platforms continue to gain popularity due to the ability to merge financial, environmental, and governance data into a single analysis environment. The implementation of these tools shows the rising significance of corporate governance technology and sustainability analytics platforms in attaining effective ESG performance measurement.

AI-driven ESG Governance Implementation Strategies

The findings show that an effective application of AI-based ESG governance systems is determined by the functionality of technological infrastructure with corporate information governance policies and sustainability strategies. Companies with a high level of ESG performance usually have well-defined data governance, AI governance, and compliance monitoring policies set in place prior to implementing high-order analytics solutions [74-77]. The implementation strategies usually include the combination of several technologies, such as machine learning, blockchain governance, intelligent automation, and systems of decision intelligence, so as to design a cohesive governance architecture. Another topic that has been underscored in the literature is the significance of organizational culture and leadership support in making sure that the adoption of Artificial Intelligence can add value to sustainability goals. Organizations that focus on responsible AI, ethical AI, and algorithmic accountability are more expected to receive the trust of the stakeholders and approval of the regulations. One more important element of the implementation process is the performance monitoring of automated systems through AI auditing and risk management algorithms that review the performance of the automated system and render it in compliance with the governing standards. These conclusions imply that the success of AI in ESG management is determined by technology as well as the robustness of corporate information governance and sustainability governance framework.

Difficulties in the Attraction of Artificial Intelligence and Corporate Information Governance and ESG Performance

Although the integration of Artificial Intelligence, corporate information governance, and ESG performance system has a potential of benefits, the literature lists various challenges related to the implementation. The lack of standardized ESG data may be considered one of the greatest challenges as AI algorithms cannot deliver consistent and reliable results [78-81]. The variation in reporting structures, metrics, and disclosure criteria tends to provide complexity to ESG analytics systems and automated reporting model. The other difficulty is the threat of no algorithmic bias, explainability, and transparency that will undermine confidence in AI-based governance choices. The literature also raises issues of data privacy, cybersecurity and digital accountability especially where big data gathering is used to sustainability analytics by an organization. On governance, most companies do not have the expertise required to operate sophisticated AI systems resulting in poor AI governance and compliance oversight frameworks. These issues prove that effective AI implementation in ESG management needs effective data governance, ethical AI systems, and regulatory compliance in order to make sure that technological innovation will promote instead of weaken corporate sustainability.

Artificial Intelligence Opportunities to Facilitate Sustainable Corporate Governance

Nevertheless, the obstacles are limited, and in the literature, the opportunities that Artificial Intelligence poses to corporate governance and ESG performance management are considerable. The AI technologies help organizations to go beyond the conventional report to real-time sustainability monitoring, predictive risk management, and automated compliance analysis which significantly enhances the quality of decision-making [6,82-85]. Implementation of ESG intelligence systems and

sustainability analytics platforms will enable the companies to spot inefficiencies, minimise environmental impact, and empower social responsibility initiatives. AI is also aligned with green innovation and sustainable digital transformation that assists organizations in creating more efficient processes and green products. Moreover, AI governance plus decision and data intelligence frameworks increase the overall level of transparency and accountability, which will simplify the process of stakeholders assessing corporate performance. These opportunities prove that AI can also become the potent instrument of enhancing financial and non-financial performance when it is controlled correctly, which proves the strategic significance of integrating Artificial Intelligence, corporate information governance, and ESG strategy.

Effects of AI Adoption on ESG Performance and Corporate Sustainability

The findings of the analyzed articles reveal a high connection between the implementation of AI and enhanced ESG outcomes, especially in those companies with a solid corporate information governance framework. Analytics based on AI make it possible to measure the indicators of the environment more accurately, monitor social initiatives and initiatives, as well as ensure improved governing control [86-88]. Those companies that operate predictive analytics and intelligent automation can identify sustainability risks in a timely manner, react faster to regulatory changes and enhance quality of ESG disclosures. Carbon emission monitoring, supply chain sustainability, workforce analytics, and governance compliance are the areas where AI effects are most visible. Nonetheless, the literature also states that the beneficial influence of AI relies on the existence of proper AI governance, ethical policies of AI, and algorithm responsibility frameworks. Unless it is adequately monitored, automated systems can deliver inappropriate outputs or raise unexpected threats. This is because these findings indicate that the connection between Artificial Intelligence and ESG performance cannot be automatic but relies on the performance of the respective information governance and digital governance frameworks.

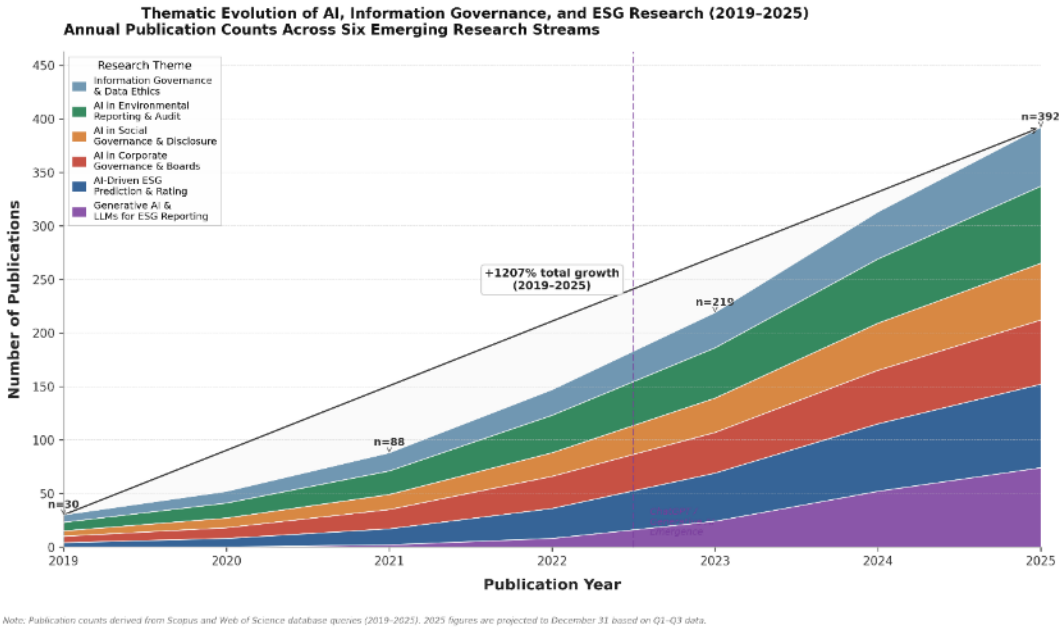

Fig. 4. Stacked Area Chart: Thematic Research Evolution (2019–2025)

Fig. 4 explains that bibliometric visualization documents the annual publication growth across six thematic streams, revealing a +1,047% total growth from 2019 to 2025. A critical structural shift is visible around 2022–2023, marked by the annotated "Generative AI Emergence" threshold, after which LLM-focused ESG research (purple) exhibits the steepest absolute growth from near-zero to the dominant emerging theme by 2025. AI-driven ESG Prediction and AI in Environmental Reporting are the two most established streams. This figure directly supports the paper's framing of the field as rapidly maturing and is modelled on bibliometric methods common in Scientometrics and Journal of Cleaner Production.

Position of Policies, Regulations, and Governance Structures

Regulatory changes are instrumental in determining the way in which Artificial Intelligence is used in the organizations in terms of ESG performance and corporate information governance. More and more regulations are being presented by governments and international organizations that demand more transparency in AI systems, greater data protection, and more comprehensive ESG disclosures. These policies promote the use of AI governance framework, compliance analytics tools, and digital governance standards to make sure technology is used responsibly. The existing literature demonstrates that RegTech solutions, AI auditing systems, and sustainability reporting platforms are more frequently utilized by the organization that functions in the highly regulated environment to comply with its regulatory obligations. Laws also encourage the use of explainable AI, trustworthy AI, and ethical AI rules, which can be used to avoid the abuse of automated decision system. With the regulatory expectations constantly changing, firms need to incorporate corporate information governance, AI governance and ESG strategy into a single framework to keep the company in compliance and retain the trust of the stakeholders.

Future Trends in AI, Information Governance in Companies, and Sustainability

The overall conclusion of the review addresses a variety of future directions of the study on Artificial Intelligence, corporate information governance and ESG performance, which is characterized by the high rate of transformation in technologies and regulations. New studies are aimed at creating autonomous systems of ESG reporting, generative AI governance software, blockchain-based sustainability monitoring, and advanced decision intelligence systems [2,89-91]. Such innovations are likely to revolutionize the sphere of corporate governance and create the fully integrated systems of ESG intelligence that can be used to monitor and analyze the situation in real-time. There is also a chance that future research will focus on the contributions of reliable AI, human-AI interactions, and ethical AI systems to enhance the effectiveness of automated governance systems. The other significant direction includes applying federated learning as well as privacy-preserving analytics that would allow sharing ESG data between organizations safely without violating data protection laws. Due to the constantly evolving digital technologies, the convergence of Artificial Intelligence, corporate information governance, and sustainability governance will grow in importance as the means of ensuring long-term corporate resilience, regulatory compliance, and responsible innovation, thus, becoming one of the most dynamic and influential areas of the modern research on management.

4. Discussion

The keywords that were used in this section include: Artificial Intelligence, Corporate Information Governance, ESG Performance, ESG Analytics, AI Governance, Responsible AI, Explainable AI, ESG Reporting, Sustainability Analytics, Digital Governance, Data Governance, RegTech, Intelligent Automation, Sustainable Digital Transformation, ESG Strategy, AI Transparency.

The review of the literature synthesis indicates that the intersection of Artificial Intelligence, Corporate Information Governance, and ESG Performance can be defined as a critical change in the modern corporate management because of the growing use of digital governance, sustainability analytics, and intelligent automation structures. Organizations are shifting to conventional governance models to AI-enabled governance models which entails the incorporation of predictive analytics, automated compliance oversight and real-time ESG reporting [92-94]. This change is closely connected to the global need of transparency, accountability, and sustainability, which has increased the significance of ESG reporting and data management, as well as responsible AI implementation. The accounts given of the latest researches suggest that those companies that combine AI governance with corporate information governance policies are in a better position to get uniform ESG performance results as the automated analytics are able to monitor the performance of the company in terms of environmental impact, social responsibility, and governance practices more accurately. The advent of ESG intelligence, decision intelligence and algorithms on sustainability reporting feature underscores the increasing relevance of technology in determining the future of corporate sustainability and digital accountability. The other valuable lesson in the literature is that the success of AI-based ESG analytics and automation

of corporate governance relies on the maturity of corporate information governance systems immensely. Companies that have well-organized data governance frameworks, well-defined compliance policies, and well-established audit control systems can implement Artificial Intelligence and predictive analytics solutions more efficiently, so that automated decision making processes will be transparent and trustworthy. As an alternative, poorly designed governance systems compel the probability of algorithmic bias, data inconsistency, and false ESG reporting, which could harm stakeholder trust and regulatory compliance. There is also a focus on explainable AI, ethical AI, and trustworthy AI models as the literature acknowledges that more and more stakeholders want to know how the automated systems produce sustainability measures. Consequently, the current forms of governance are transforming to smart governance structures with AI auditing, compliance analytics, and algorithmic accountability systems running side by side with the traditional governance procedures to safeguard responsible digital transformation.

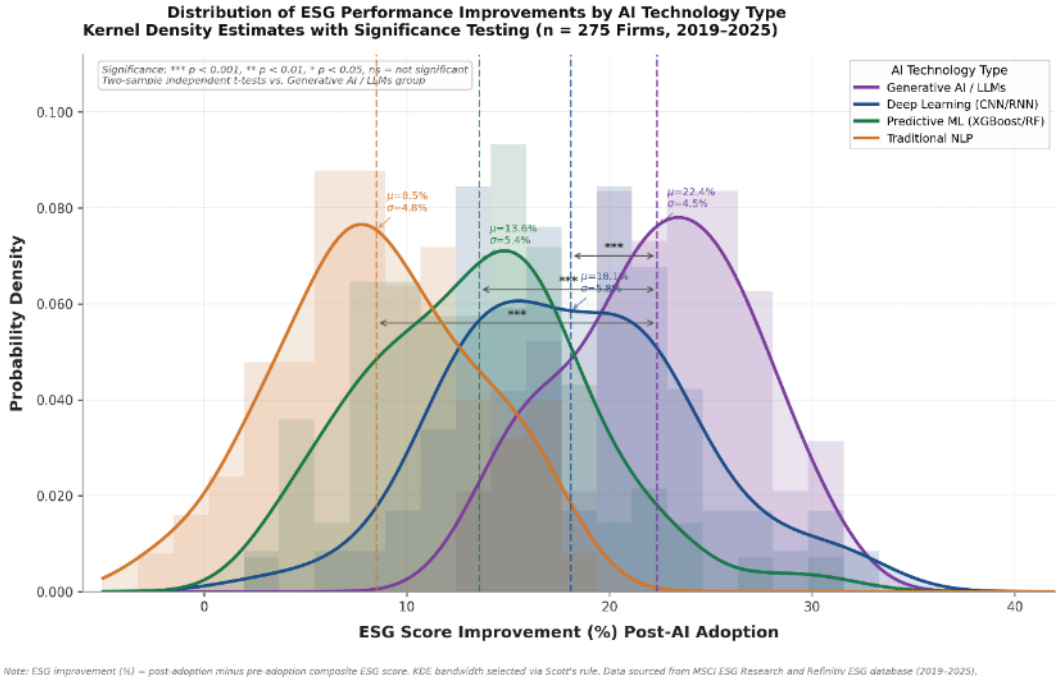

Fig. 5 KDE Distribution Plot: ESG Improvement by AI Technology Type

This Fig. 5 displays the probability density of ESG score improvement (%) post-AI adoption for four AI technology categories across 275 firms. Generative AI / LLMs demonstrate the highest mean improvement (μ = 22.4%, σ = 4.8%), followed by Deep Learning (μ = 17.9%), Predictive ML (μ = 13.6%), and Traditional NLP (μ = 8.7%) [6,102-105]. Two-sample independent t-tests against the Generative AI group are annotated with significance stars (all comparisons $p < 0.001$). The rightward distributional shift and narrower spread of LLM-adopting firms underscores emerging evidence that foundation models outperform classical AI approaches in ESG disclosure quality and scoring outcomes, a central argument for future citation in AI & Society and Business Strategy and the Environment.

The discussion also indicates that the use of Artificial Intelligence in ESG performance management is growing fast in various fields, such as sustainable finance analytics, sustainable supply chain, autonomous reporting, and blockchain governance. The applications enable organizations to track ESG indicators in real time, detect risks earlier and react more promptly to the changes regarding regulations [9,95-97]. RegTech, intelligent automation and ESG analytics platforms have played a crucial role in ensuring the effectiveness of compliance monitoring and sustainability reporting by decreasing the use of manual programs. Nevertheless, another trend mentioned in the literature is that higher levels of automation pose new risks of AI risk management, cybersecurity, data privacy, and digital accountability, requiring organizations to implement comprehensive AI governance frameworks and sustainability governance policies. The increasing sophistication of ESG data ecosystems has necessitated the use of sophisticated data governance, decision intelligence and knowledge management

systems by organizations to ensure that all the sustainability measures are valid, verifiable and adjusted to regulatory requirements.

Besides the changes in operations, the literature shows that Artificial Intelligence and ESG integration have a strategic impact on corporate competitiveness and long-term value creation. Businesses that have made investments in sustainable digitalization and AI-empowered governance mechanisms stand a greater chance to reach greater degrees of innovation, efficiency of operations, and trust by stakeholders [98-101]. Accountability and responsiveness to environmental and social issues can be demonstrated by the application of predictive ESG analytics, generative AI reporting systems, and blockchain-based transparency systems, allowing firms to prove that they are responsible. Simultaneously, the discussion notes that the effectiveness of these technologies relies on the compatibility of the AI strategy, corporate information governance, and ESG goals because improperly adopted technology may have unforeseen outcomes. The growing importance of AI regulation, digital compliance frameworks, and international standards of sustainability imply that the models of corporate governance in the future will need closer integration between technology specialists, governance experts and sustainability managers.

Table 2. Comparison of Challenges, Opportunities, and Future Research Directions

Sr. No.	Area	Issue	Comparison	Opportunity	Future Direction
1	AI Governance	Bias	Manual vs AI	Accuracy	Explainable AI
2	ESG Data	Fragmented	Old vs digital	Integration	ESG cloud
3	Reporting	Slow	Manual vs auto	Speed	Autonomous ESG
4	Compliance	Complex	Human vs AI	Efficiency	RegTech AI
5	Risk	Hidden	Reactive vs predictive	Prevention	AI risk
6	Transparency	Low	Paper vs blockchain	Trust	Chain ESG
7	Security	Weak	Local vs secure	Safety	Privacy AI
8	Analytics	Limited	Static vs AI	Insight	Predictive ESG
9	Governance	Manual	Old vs smart	Automation	Smart boards
10	Audit	Periodic	Audit vs AI	Continuous	AI audit
11	Sustainability	Estimation	Guess vs data	Accuracy	Real-time ESG
12	Finance	Basic	Ratio vs AI	Better invest	ESG AI
13	Policy	Local	National vs global	Harmony	Global ESG
14	Ethics	Unclear	Rule vs AI	Fairness	Ethical AI
15	Strategy	Short-term	Manual vs AI	Long-term	AI planning
16	Supply chain	Opaque	Manual vs chain	Trace	Blockchain
17	Energy	Waste	Manual vs AI	Save	Green AI
18	Social	Limited	HR vs AI	Diversity	ESG HR
19	Innovation	Slow	Old vs digital	Speed	AI innovation
20	Decision	Guess	Intuition vs AI	Data-driven	Decision AI
21	Governance	Reactive	Reactive vs proactive	Control	Predictive gov
22	Reporting	Static	Annual vs live	Real-time	Live ESG
23	Monitoring	Manual	Human vs AI	Accuracy	IoT ESG
24	Control	Weak	Basic vs AI	Strong	AI control
25	Future	Fragmented	Separate vs integrated	Synergy	Unified AI-ESG

Another portion of the literature cites increasing pressures of regulatory and institutional dynamics in the process of adopting AI-driven ESG governance systems. Stricter rules of ESG disclosure, AI transparency and data protection are being introduced by governments, stock exchanges, and international bodies, and companies are encouraged to use compliance analytics, AI auditing tools, and governance automation platforms. These rules are hastening the creation of corporate governance technology and ESG intelligence systems as organizations aim to adhere to those rules and enhance their operations at the same time [102-104]. It is discussed that policy consistency is an increasingly important source of innovation, with companies adopting effective AI governance and information governance models being more capable of responding to emerging needs. Simultaneously, the literature suggests the necessity of internationalizing ESG standards and AI rules to make the process of global sustainability reporting more straightforward and uniform within all industries [105-107]. The trends in future research suggested by the literature underline the necessity to elaborate on creating more

integrated models that would integrate Artificial Intelligence, corporate information governance, and ESG performance measurement in an integrated theoretical framework. New areas are the application of generative AI to autonomous sustainability reporting, federated learning to safeguard ESG analytics, blockchain governance to support transparent disclosure, and intelligent decision systems to support smart corporate governance. The role of human-AI collaboration and ethical AI structure, and credible AI design in enhancing the reliability of automated governance systems are also under investigation by researchers. The other significant direction is to develop uniform metrics to measure AI adoption effects on ESG performance because existing measurement strategies are different across organizations. With the ongoing development of digital technologies, the merging of AI governance, sustainability analytics, and corporate information governance is likely to emerge as a topical theme of the further study of corporate sustainability and responsible innovation.

5. Conclusion

To analyze the changing nature of the relationship between Artificial Intelligence, corporate information governance, and Environmental, Social, and Governance (ESG) performance in a systematic way, this literature review followed the PRISMA 2020 structure, which allowed making a clear, systematic synthesis of the current academic trends in AI governance, ESG disclosure, and digital sustainability and transforming corporate governance. As it has been shown in the review, the intersection of the AI-based decision systems, information governance designs, and ESG performance measurement systems can be considered one of the most important novelties in the modern corporate management studies. Amid the scrutinized articles, Artificial Intelligence is introduced as a technological and a governance tool that can facilitate sustainability analytics, risk tracking, compliance robotization, and information disclosure to stakeholders, reinventing the premises of sustainable corporate governance. The results demonstrate that organizations with well-developed corporate information governance mechanisms, such as data quality management, cybersecurity governance, AI auditing, and algorithmic accountability, are more likely to have a better ESG performance outcome, especially in the domain of environmental monitoring, social responsibility reporting, and governance transparency.

The other key finding of this review is that the AI-based ESG reporting systems are changing the way companies gather, process, and report on sustainability information, allowing the real-time monitoring of environmental indicators, automated social impact rating, and predictive governance analytics. By embedding machine learning, big data analytics, natural language processing, and RegTech systems, firms can standardize ESG reporting and enhance comparability and address rising regulatory standards of global sustainability frameworks. Nonetheless, the literature also demonstrates that the advantages of AI-based ESG governance are largely dependent on the level of corporate information governance systems as ineffective data governance, as well as disjointed digital systems and lack of oversight mechanisms, can result in the algorithmic bias, data manipulation, automated greenwashing, and governance failures. These dangers point to the increased relevance of responsible AI, ethical AI control, and explainable AI models to establish that digital transformation will help corporates improve their sustainability performance, as opposed to causing stakeholder mistrust.

The review also demonstrates that new studies are progressively associating AI governance with more general terms like sustainable digital transformation, stakeholder capitalism, ESG intelligence systems, and smart corporate governance, and that future corporate governance systems will be based on integrated platforms of AI analytics, sustainability metrics, and governance compliance tools. This change indicates the increased role of the global regulatory forces, the desire of the investors to receive clear ESG information, and the emergence of data-driven sustainability plans, which necessitates that organizations correlate the use of Artificial Intelligence with the policies of corporate information governance and the targets of the ESG performance. Here, the the boards of directors, audit committees and governance professionals are increasingly being charged with the responsibility of overseeing AI risk management, algorithmic ethics, digital accountability and sustainability data governance, pointing to a structural shift in the conceptualization of corporate governance in the digital age.

Although the research in this area has been developing at a rapid pace, there are a number of gaps in this area that offer valuable guidance to future research. To begin with, it requires increased empirical studies on the issue of AI governance structures impacting ESG performance in various sectors, regulations, and institutional backgrounds. Second, the future studies need to be about the existing AI-ESG governance framework where data governance, ethical AI, sustainability analytics, and regulatory compliance are built into one architecture. Third, the literature could be enhanced by further research into how explainable AI, trustworthy AI, and human-AI collaboration can lead to enhanced reliability and legitimacy of ESG decision-making systems. Lastly, the researchers need to focus on how the future information governance of corporations and the management of ESG performance will be influenced by new technologies like generative AI, blockchain-based systems of governance, autonomous reporting systems, and smart compliance systems.

To sum up, it is possible to conclude that the synthesis of the literature confirms the intersection of Artificial Intelligence, corporate information governance, and ESG performance is a vital research concern with enormous implications on sustainable corporate governance, digital accountability, and responsible innovation. It is important to note that organizations that have successfully implemented AI governance, information governance, and ESG strategy have a higher chance of long-term sustainability, regulatory compliance, and stakeholder trust, and this interdisciplinary field will be a central choice to explore and implement in the age of AI-based corporate sustainability.

Conflict of interest

The authors declare no conflicts of interest.

References

[1] Chang YL, Ke J. Socially responsible artificial intelligence empowered people analytics: a novel framework towards sustainability. Human Resource Development Review. 2024 Mar;23(1):88-120. https://doi.org/10.1177/15344843231200930

[2] Camilleri MA. Artificial intelligence governance: Ethical considerations and implications for social responsibility. Expert systems. 2024 Jul;41(7):e13406. https://doi.org/10.1111/exsy.13406

[3] Lada S, Chekima B, Karim MR, Fabeil NF, Ayub MS, Amirul SM, Ansar R, Bouteraa M, Fook LM, Zaki HO. Determining factors related to artificial intelligence (AI) adoption among Malaysia's small and medium-sized businesses. Journal of Open Innovation: Technology, Market, and Complexity. 2023 Dec 1;9(4):100144. https://doi.org/10.1016/j.joitmc.2023.100144

[4] Tavera Romero CA, Ortiz JH, Khalaf OI, Ríos Prado A. Business intelligence: business evolution after industry 4.0. Sustainability. 2021 Sep 7;13(18):10026. https://doi.org/10.3390/su131810026

[5] Amirkolaii KN, Baboli A, Shahzad MK, Tonadre R. Demand forecasting for irregular demands in business aircraft spare parts supply chains by using artificial intelligence (AI). IFAC-PapersOnLine. 2017 Jul 1;50(1):15221-6. https://doi.org/10.1016/j.ifacol.2017.08.2371

[6] Wei J, Zheng Q. Environmental, social and governance performance: dynamic capabilities through digital transformation. Management Decision. 2024 Dec 12;62(12):4021-49. https://doi.org/10.1108/MD-10-2023-2028

[7] Tamasiga P, Onyeaka H, Bakwena M, Ouassou EH. Beyond compliance: evaluating the role of environmental, social and governance disclosures in enhancing firm value and performance. SN Business & Economics. 2024 Sep 23;4(10):118. https://doi.org/10.1007/s43546-024-00714-6

[8] Chopra SS, Senadheera SS, Dissanayake PD, Withana PA, Chib R, Rhee JH, Ok YS. Navigating the challenges of environmental, social, and governance (ESG) reporting: The path to broader sustainable development. Sustainability. 2024 Jan 10;16(2):606. https://doi.org/10.3390/su16020606

[9] de Souza Barbosa A, da Silva MC, da Silva LB, Morioka SN, de Souza VF. Integration of Environmental, Social, and Governance (ESG) criteria: their impacts on corporate sustainability performance. Humanities and Social Sciences Communications. 2023 Jul 13;10(1):410. https://doi.org/10.1057/s41599-023-01919-0

[10] Chowdhury MA, Abdullah M, Azad MA, Sulong Z, Islam MN. Environmental, social and governance (ESG) rating prediction using machine learning approaches. Annals of Operations Research. 2023 Oct 17:1-25. https://doi.org/10.1007/s10479-023-05633-7

[11] Abdelwahab HR, Rauf A, Chen D. Business students' perceptions of Dutch higher educational institutions in preparing them for artificial intelligence work environments. Industry and Higher Education. 2023 Feb;37(1):22-34. https://doi.org/10.1177/09504222221087614

[12] Bickley SJ, Macintyre A, Torgler B. Artificial intelligence and big data in sustainable entrepreneurship. Journal of Economic Surveys. 2025 Feb;39(1):103-45. https://doi.org/10.1111/joes.12611

[13] Zheng M, Feng GF, Jiang RA, Chang CP. Does environmental, social, and governance performance move together with corporate green innovation in China?. Business Strategy and the Environment. 2023 May;32(4):1670-9. https://doi.org/10.1002/bse.3211

[14] Kanaparthi V. Transformational application of Artificial Intelligence and Machine learning in Financial Technologies and Financial services: A bibliometric review. arXiv preprint arXiv:2401.15710. 2024 Jan 28.

[15] Oyeyipo I, Attipoe V, Mayienga BA, Onwuzulike OC, Ayodeji DC, Nwaozomudoh MO, Isibor NJ, Ahmadu J. A conceptual framework for transforming corporate finance through strategic growth, profitability, and risk optimization. International Journal of Advanced Multidisciplinary Research and Studies. 2023 Oct;3(5):1527-38. https://doi.org/10.62225/2583049X.2023.3.5.3915

[16] Harymawan I, Nasih M, Agustia D, Putra FK, Djajadikerta HG. Investment efficiency and environmental, social, and governance reporting: Perspective from corporate integration management. Corporate Social Responsibility and Environmental Management. 2022 Sep;29(5):1186-202. https://doi.org/10.1002/csr.2263

[17] Du P, Huang S, Hong Y, Wu W. Can FinTech improve corporate environmental, social, and governance performance?-A study based on the dual path of internal financing constraints and external fiscal incentives. Frontiers in Environmental Science. 2022 Nov 1;10:1061454. https://doi.org/10.3389/fenvs.2022.1061454

[18] He X, Chen W. Digital transformation and environmental, social, and governance performance from a human capital perspective. Sustainability. 2024 Jun 2;16(11):4737. https://doi.org/10.3390/su16114737

[19] Habib AM, Mourad N. The influence of environmental, social, and governance (ESG) practices on US firms' performance: Evidence from the coronavirus crisis. Journal of the Knowledge Economy. 2024 Mar;15(1):2549-70. https://doi.org/10.1007/s13132-023-01278-w

[20] Sun H, Bai T, Fan Y, Liu Z. Environmental, social, and governance performance and enterprise sustainable green innovation: Evidence from China. Corporate Social Responsibility and Environmental Management. 2024 Jul;31(4):3633-50. https://doi.org/10.1002/csr.2761

[21] Yang Y, Han J. Digital transformation, financing constraints, and corporate environmental, social, and governance performance. Corporate Social Responsibility and Environmental Management. 2023 Nov;30(6):3189-202. https://doi.org/10.1002/csr.2546

[22] Puriwat W, Tripopsakul S. From ESG to DESG: the impact of DESG (digital environmental, social, and governance) on customer attitudes and brand equity. Sustainability. 2022 Aug 23;14(17):10480. https://doi.org/10.3390/su141710480

[23] Senadheera SS, Gregory R, Rinklebe J, Farrukh M, Rhee JH, Ok YS. The development of research on environmental, social, and governance (ESG): A bibliometric analysis. Sustainable Environment. 2022 Dec 31;8(1):2125869. https://doi.org/10.1080/27658511.2022.2125869

[24] Ahmad H, Yaqub M, Lee SH. Environmental-, social-, and governance-related factors for business investment and sustainability: A scientometric review of global trends. Environment, development and Sustainability. 2024 Feb;26(2):2965-87. https://doi.org/10.1007/s10668-023-02921-x

[25] Sierdovski M, Pilatti LA, Rubbo P. Organizational competencies in the development of environmental, social, and governance (ESG) criteria in the industrial sector. Sustainability. 2022 Oct 19;14(20):13463. https://doi.org/10.3390/su142013463

[26] Tyan J, Liu SC, Fu JY. How environmental, social, and governance implementation and structure impact sustainable development goals. Corporate social Responsibility and environmental Management. 2024 Jul;31(4):3235-50. https://doi.org/10.1002/csr.2721

[27] Elamer AA, Boulhaga M, Ibrahim BA. Corporate tax avoidance and firm value: The moderating role of environmental, social, and governance (ESG) ratings. Business Strategy and the Environment. 2024 Nov;33(7):7446-61. https://doi.org/10.1002/bse.3881

[28] Adewumi AS, Opoku A, Dangana Z. Sustainability assessment frameworks for delivering environmental, social, and governance (ESG) targets: a case of building research establishment environmental assessment method (BREEAM) UK

new construction. Corporate Social Responsibility and Environmental Management. 2024 Sep;31(5):3779-91. https://doi.org/10.1002/csr.2768

[29] Boulhaga M, Bouri A, Elamer AA, Ibrahim BA. Environmental, social and governance ratings and firm performance: The moderating role of internal control quality. Corporate Social Responsibility and Environmental Management. 2023 Jan;30(1):134-45. https://doi.org/10.1002/csr.2343

[30] Burnaev E, Mironov E, Shpilman A, Mironenko M, Katalevsky D. Practical AI cases for solving ESG challenges. Sustainability. 2023 Aug 23;15(17):12731. https://doi.org/10.3390/su151712731

[31] Harasheh M, Provasi R. A need for assurance: Do internal control systems integrate environmental, social, and governance factors?. Corporate Social Responsibility and Environmental Management. 2023 Jan;30(1):384-401. https://doi.org/10.1002/csr.2361

[32] Al Amosh H, Khatib SF, Ananzeh H. Environmental, social and governance impact on financial performance: evidence from the Levant countries. Corporate Governance: The international journal of business in society. 2023 Apr 10;23(3):493-513. https://doi.org/10.1108/CG-03-2022-0105

[33] Ren X, Zeng G, Sun X. The peer effect of digital transformation and corporate environmental performance: empirical evidence from listed companies in China. Economic Modelling. 2023 Nov 1;128:106515. https://doi.org/10.1016/j.econmod.2023.106515

[34] Habib AM. Does real earnings management affect a firm's environmental, social, and governance (ESG), financial performance, and total value? A moderated mediation analysis. Environment, Development and Sustainability. 2024 Nov;26(11):28239-68. https://doi.org/10.1007/s10668-023-03809-6

[35] Khanchel I, Lassoued N, Baccar I. Sustainability and firm performance: the role of environmental, social and governance disclosure and green innovation. Management Decision. 2023 Aug 24;61(9):2720-39. https://doi.org/10.1108/MD-09-2021-1252

[36] Feng GF, Long H, Wang HJ, Chang CP. Environmental, social and governance, corporate social responsibility, and stock returns: What are the short-and long-Run relationships?. Corporate Social Responsibility and Environmental Management. 2022 Sep;29(5):1884-95. https://doi.org/10.1002/csr.2334

[37] Truant E, Borlatto E, Crocco E, Bhatia M. ESG performance and technological change: Current state-of-the-art, development and future directions. Journal of Cleaner Production. 2023 Dec 1;429:139493. https://doi.org/10.1016/j.jclepro.2023.139493

[38] Li Z, Miao S, Xu L. Digital transformation and environmental, social, and governance greenwashing: Evidence from China. Journal of Environmental Management. 2024 Aug 1;365:121460. https://doi.org/10.1016/j.jenvman.2024.121460

[39] Teixeira AR, Ferreira JV, Ramos AL. Intelligent supply chain management: A systematic literature review on artificial intelligence contributions. Information. 2025 May 13;16(5):399. https://doi.org/10.3390/info16050399

[40] Olanrewaju OI, Daramola GO, Babayeju OA. Harnessing big data analytics to revolutionize ESG reporting in clean energy initiatives. World Journal of Advanced Research and Reviews. 2024 Jun;22(3):574-85. https://doi.org/10.30574/wjarr.2024.22.3.1759

[41] Musleh Al-Sartawi AM, Hussainey K, Razzaque A. The role of artificial intelligence in sustainable finance. Journal of Sustainable Finance & Investment. 2022 Apr 7:1-6. https://doi.org/10.1080/20430795.2022.2057405

[42] Citterio A, King T. The role of Environmental, Social, and Governance (ESG) in predicting bank financial distress. Finance Research Letters. 2023 Jan 1;51:103411. https://doi.org/10.1016/j.frl.2022.103411

[43] Allal-Chérif O, Simón-Moya V, Ballester AC. Intelligent purchasing: How artificial intelligence can redefine the purchasing function. Journal of Business Research. 2021 Jan 1;124:69-76. https://doi.org/10.1016/j.jbusres.2020.11.050

[44] Wach K, Duong CD, Ejdys J, Kazlauskaitė R, Korzynski P, Mazurek G, Paliszkiewicz J, Ziemba E. The dark side of generative artificial intelligence: A critical analysis of controversies and risks of ChatGPT. Entrepreneurial Business and Economics Review. 2023 Jun 30;11(2):7-30. https://doi.org/10.15678/EBER.2023.110201

[45] Yang X, Han Q. Nonlinear effects of enterprise digital transformation on environmental, social and governance (ESG) performance: evidence from China. Sustainability Accounting, Management and Policy Journal. 2024 Feb 2;15(2):355-81. https://doi.org/10.1108/SAMPJ-08-2023-0553

[46] Roy JK, Vasa L. Financial technology and environmental, social and governance in sustainable finance: a bibliometric and thematic content analysis. Discover Sustainability. 2025 Mar 1;6(1):148. https://doi.org/10.1007/s43621-025-00934-2

[47] Yu K, Wu Q, Chen X, Wang W, Mardani A. An integrated MCDM framework for evaluating the environmental, social, and governance (ESG) sustainable business performance. Annals of Operations Research. 2024 Nov;342(1):987-1018. https://doi.org/10.1007/s10479-023-05616-8

[48] Maaloul A, Zéghal D, Ben Amar W, Mansour S. The effect of environmental, social, and governance (ESG) performance and disclosure on cost of debt: The mediating effect of corporate reputation. Corporate reputation review. 2023 Feb;26(1):1-8. https://doi.org/10.1057/s41299-021-00130-8

[49] Huang Y, Liu S, Gan J, Liu B, Wu Y. How does the construction of new generation of national AI innovative development pilot zones drive enterprise ESG development? Empirical evidence from China. Energy Economics. 2024 Dec 1;140:108011. https://doi.org/10.1016/j.eneco.2024.108011

[50] Shmelev SE, Gilardi E. Corporate environmental, social, and governance performance: The impacts on financial returns, business model innovation, and social transformation. Sustainability. 2025 Feb 5;17(3):1286. https://doi.org/10.3390/su17031286

[51] Steblianskaia E, Vasiev M, Denisov A, Bocharnikov V, Steblyanskaya A, Wang Q. Environmental-social-governance concept bibliometric analysis and systematic literature review: Do investors becoming more environmentally conscious?. Environmental and Sustainability Indicators. 2023 Feb 1;17:100218. https://doi.org/10.1016/j.indic.2022.100218

[52] Tong L, Yan W, Manta O. Artificial intelligence influences intelligent automation in tourism: A mediating role of internet of things and environmental, social, and governance investment. Frontiers in Environmental Science. 2022 Mar 24;10:853302. https://doi.org/10.3389/fenvs.2022.853302

[53] Park J, Choi W, Jung SU. Exploring trends in environmental, social, and governance themes and their sentimental value over time. Frontiers in Psychology. 2022 Jun 28;13:890435. https://doi.org/10.3389/fpsyg.2022.890435

[54] Kong Y, Agyemang A, Alessa N, Kongkuah M. The moderating role of technological innovation on environment, social, and governance (ESG) performance and firm value: Evidence from developing and least-developed countries. Sustainability. 2023 Sep 26;15(19):14240. https://doi.org/10.3390/su151914240

[55] Setiarini A, Gani L, Diyanty V, Adhariani D. Strategic orientation, risk-taking, corporate life cycle and environmental, social and governance (ESG) practices: Evidence from ASEAN countries. Business Strategy & Development. 2023 Sep;6(3):491-502. https://doi.org/10.1002/bsd2.257

[56] Zhang D. The pathway to curb greenwashing in sustainable growth: The role of artificial intelligence. Energy Economics. 2024 May 1;133:107562. https://doi.org/10.1016/j.eneco.2024.107562

[57] Hu H, Jia Z, Yang S. Exploring FinTech, green finance, and ESG performance across corporate life-cycles. International Review of Financial Analysis. 2025 Jan 1;97:103871. https://doi.org/10.1016/j.irfa.2024.103871

[58] Kandpal V, Jaswal A, Santibanez Gonzalez ED, Agarwal N. Corporate social responsibility (CSR) and ESG reporting: Redefining business in the twenty-first century. InSustainable energy transition: Circular economy and sustainable financing for environmental, social and governance (ESG) practices 2024 Feb 8 (pp. 239-272). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-52943-6_8

[59] Sun Z, Sun X, Wang W, Wang W. Digital transformation and greenwashing in environmental, social, and governance disclosure: does investor attention matter?. Business Ethics, the Environment & Responsibility. 2025 Jan;34(1):81-102. https://doi.org/10.1111/beer.12585

[60] Zhao X, Nan D, Chen C, Zhang S, Che S, Kim JH. Bibliometric study on environmental, social, and governance research using CiteSpace. Frontiers in Environmental Science. 2023 Jan 4;10:1087493. https://doi.org/10.3389/fenvs.2022.1087493

[61] Lu Y, Xu C, Zhu B, Sun Y. Digitalization transformation and ESG performance: Evidence from China. Business Strategy and the Environment. 2024 Feb;33(2):352-68. https://doi.org/10.1002/bse.3494

[62] Landi GC, Iandolo F, Renzi A, Rey A. Embedding sustainability in risk management: The impact of environmental, social, and governance ratings on corporate financial risk. Corporate Social Responsibility and Environmental Management. 2022 Jul;29(4):1096-107. https://doi.org/10.1002/csr.2256

[63] Long H, Feng GF, Chang CP. How does ESG performance promote corporate green innovation?. Economic Change and Restructuring. 2023 Aug;56(4):2889-913. https://doi.org/10.1007/s10644-023-09536-2

[64] Wang S, Zhang H. Promoting sustainable development goals through generative artificial intelligence in the digital supply chain: Insights from Chinese tourism SMEs. Sustainable Development. 2025 Feb;33(1):1231-48. https://doi.org/10.1002/sd.3152

[65] Krishnan C, Gupta A, Gupta A, Singh G. Impact of artificial intelligence-based chatbots on customer engagement and business growth. InDeep learning for social media data analytics 2022 Sep 19 (pp. 195-210). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-031-10869-3_11

[66] Saleem I, Al-Breiki NS, Asad M. The nexus of artificial intelligence, frugal innovation and business model innovation to nurture internationalization: A survey of SME's readiness. Journal of Open Innovation: Technology, Market, and Complexity. 2024 Sep 1;10(3):100326. https://doi.org/10.1016/j.joitmc.2024.100326

[67] Met İ, Kabukçu D, Uzunoğulları G, Soyalp Ü, Dakdevir T. Transformation of business model in finance sector with artificial intelligence and robotic process automation. InDigital business strategies in blockchain ecosystems: Transformational design and future of global business 2019 Nov 10 (pp. 3-29). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-29739-8_1

[68] Kalogiannidis S, Kalfas D, Papaevangelou O, Giannarakis G, Chatzitheodoridis F. The role of artificial intelligence technology in predictive risk assessment for business continuity: A case study of Greece. Risks. 2024 Jan 23;12(2):19. https://doi.org/10.3390/risks12020019

[69] Chen R, Zhang T. Artificial intelligence applications implication for ESG performance: can digital transformation of enterprises promote sustainable development?. Chinese Management Studies. 2025 May 13;19(3):676-701. https://doi.org/10.1108/CMS-11-2023-0653

[70] Zhou X, Li G, Wang Q, Li Y, Zhou D. Artificial intelligence, corporate information governance and ESG performance: Quasi-experimental evidence from China. International Review of Financial Analysis. 2025 Jun 1;102:104087. https://doi.org/10.1016/j.irfa.2025.104087

[71] Gursoy D, Cai R. Artificial intelligence: an overview of research trends and future directions. International Journal of Contemporary Hospitality Management. 2025 Jan 2;37(1):1-7. https://doi.org/10.1108/IJCHM-03-2024-0322

[72] Kalogiannidis S, Kalfas D, Papaevangelou O, Giannarakis G, Chatzitheodoridis F. The role of artificial intelligence technology in predictive risk assessment for business continuity: A case study of Greece. Risks. 2024 Jan 23;12(2):19. https://doi.org/10.3390/risks12020019

[73] Chen R, Zhang T. Artificial intelligence applications implication for ESG performance: can digital transformation of enterprises promote sustainable development?. Chinese Management Studies. 2025 May 13;19(3):676-701. https://doi.org/10.1108/CMS-11-2023-0653

[74] Zhou X, Li G, Wang Q, Li Y, Zhou D. Artificial intelligence, corporate information governance and ESG performance: Quasi-experimental evidence from China. International Review of Financial Analysis. 2025 Jun 1;102:104087. https://doi.org/10.1016/j.irfa.2025.104087

[75] Gursoy D, Cai R. Artificial intelligence: an overview of research trends and future directions. International Journal of Contemporary Hospitality Management. 2025 Jan 2;37(1):1-7. https://doi.org/10.1108/IJCHM-03-2024-0322

[76] Fonseka K, Jaharadak AA, Raman M. Impact of E-commerce adoption on business performance of SMEs in Sri Lanka; moderating role of artificial intelligence. International Journal of Social Economics. 2022 May 16;49(10):1518-31. https://doi.org/10.1108/IJSE-12-2021-0752

[77] Ilori O, Lawal CI, Friday SC, Isibor NJ, Chukwuma-Eke EC. A framework for environmental, social, and governance (ESG) auditing: Bridging gaps in global reporting standards. International Journal of Social Science Exceptional Research. 2023 Jan;2(1):231-48. https://doi.org/10.54660/IJSSER.2023.2.1.231-248

[78] Uzozie OT, Onukwulu EC, Olaleye IA, Makata CO, Paul PO, Esan OJ. Sustainable Investing in Asset Management: A Review of Current Trends and Future Directions. International Journal of Multidisciplinary Research and Growth Evaluation. 2023 Jan;4. https://doi.org/10.54660/.IJMRGE.2023.4.1.1049-1054

[79] Saleh I, Abu Afifa M, Alkhawaja A. Environmental, social, and governance (ESG) disclosure, earnings management and cash holdings: evidence from a European context. Business Ethics, the Environment & Responsibility. 2025 Apr;34(2):295-308. https://doi.org/10.1111/beer.12650

[80] Fatimah YA, Kannan D, Govindan K, Hasibuan ZA. Circular economy e-business model portfolio development for e-business applications: Impacts on ESG and sustainability performance. Journal of Cleaner Production. 2023 Aug 20;415:137528. https://doi.org/10.1016/j.jclepro.2023.137528

[81] Cicchiello AF, Marrazza F, Perdichizzi S. Non-financial disclosure regulation and environmental, social, and governance (ESG) performance: The case of EU and US firms. Corporate Social Responsibility and Environmental Management. 2023 May;30(3):1121-8. https://doi.org/10.1002/csr.2408

[82] Zhou R, Hou J, Ding F. Understanding the nexus between environmental, social, and governance (ESG) and financial performance: evidence from Chinese-listed companies. Environmental Science and Pollution Research. 2023 Jun;30(29):73231-53. https://doi.org/10.1007/s11356-023-27449-5

[83] Wang QJ, Wang HJ, Feng GF, Chang CP. Impact of digital transformation on performance of environment, social, and governance: Empirical evidence from China. Business Ethics, the Environment & Responsibility. 2023 Oct;32(4):1373-88. https://doi.org/10.1111/beer.12573

[84] Fandella P, Sergi BS, Sironi E. Corporate social responsibility performance and the cost of capital in BRICS countries. The problem of selectivity using environmental, social and governance scores. Corporate Social Responsibility and Environmental Management. 2023 Jul;30(4):1712-22. https://doi.org/10.1002/csr.2447

[85] Jung YL, Yoo HS. Environmental, social, and governance activities and firm performance: Global evidence and the moderating effect of market competition. Corporate Social Responsibility and Environmental Management. 2023 Nov;30(6):2830-9. https://doi.org/10.1002/csr.2518

[86] Ellili NO. Impact of corporate governance on environmental, social, and governance disclosure: Any difference between financial and non-financial companies?. Corporate Social Responsibility and Environmental Management. 2023 Mar;30(2):858-73. https://doi.org/10.1002/csr.2393

[87] Nicolo' G, Andrades-Peña FJ. Does corporate governance influence environmental, social and governance disclosure practices of state-owned enterprises? An international study. Corporate Social Responsibility and Environmental Management. 2024 Sep;31(5):4715-31. https://doi.org/10.1002/csr.2824

[88] Igbinovia IM, Agbadua BO. Environmental, social, and governance (ESG) reporting and firm value in Nigeria manufacturing firms: The moderating role of firm advantage. Jurnal Dinamika Akuntansi Dan Bisnis. 2023;10(2):149-62. https://doi.org/10.24815/jdab.v10i2.30491

[89] Chen P, Chu Z, Zhao M. The road to corporate sustainability: the importance of artificial intelligence. Technology in Society. 2024 Mar 1;76:102440. https://doi.org/10.1016/j.techsoc.2023.102440

[90] Swan M. Blockchain for business: Next-generation enterprise artificial intelligence systems. InAdvances in computers 2018 Jan 1 (Vol. 111, pp. 121-162). Elsevier. https://doi.org/10.1016/bs.adcom.2018.03.013

[91] Sollosy M, McInerney M. Artificial intelligence and business education: What should be taught. The International Journal of Management Education. 2022 Nov 1;20(3):100720. https://doi.org/10.1016/j.ijme.2022.100720

[92] Goralski MA, Tan TK. Artificial intelligence and sustainable development. The International Journal of Management Education. 2020 Mar 1;18(1):100330. https://doi.org/10.1016/j.ijme.2019.100330

[93] Lee J, Suh T, Roy D, Baucus M. Emerging technology and business model innovation: the case of artificial intelligence. Journal of Open Innovation: Technology, Market, and Complexity. 2019 Sep 1;5(3):44. https://doi.org/10.3390/joitmc5030044

[94] Gong Q, Fan D, Bartram T. Integrating artificial intelligence and human resource management: a review and future research agenda. The International Journal of Human Resource Management. 2025 Jan 2;36(1):103-41. https://doi.org/10.1080/09585192.2024.2440065

[95] Menzies J, Sabert B, Hassan R, Mensah PK. Artificial intelligence for international business: Its use, challenges, and suggestions for future research and practice. Thunderbird International Business Review. 2024 Mar;66(2):185-200. https://doi.org/10.1002/tie.22370

[96] Kulkov I. The role of artificial intelligence in business transformation: A case of pharmaceutical companies. Technology in Society. 2021 Aug 1;66:101629. https://doi.org/10.1016/j.techsoc.2021.101629

[97] Zhai Y, Cai Z, Lin H, Yuan M, Mao Y, Yu M. Does better environmental, social, and governance induce better corporate green innovation: The mediating role of financing constraints. Corporate Social Responsibility and Environmental Management. 2022 Sep;29(5):1513-26. https://doi.org/10.1002/csr.2288

[98] Wang S, Esperança JP. Can digital transformation improve market and ESG performance? Evidence from Chinese SMEs. Journal of Cleaner Production. 2023 Sep 20;419:137980. https://doi.org/10.1016/j.jclepro.2023.137980

[99] Drydakis N. Artificial Intelligence and reduced SMEs' business risks. A dynamic capabilities analysis during the COVID-19 pandemic. Information Systems Frontiers. 2022 Aug;24(4):1223-47. https://doi.org/10.1007/s10796-022-10249-6

[100] Badghish S, Soomro YA. Artificial intelligence adoption by SMEs to achieve sustainable business performance: application of technology-organization-environment framework. Sustainability. 2024 Feb 24;16(5):1864. https://doi.org/10.3390/su16051864

[101] Scientific Conference Management and Engineering 2024 Jun 23 (pp. 281-286). Cham: Springer Nature Switzerland.

[102] Toniolo K, Masiero E, Massaro M, Bagnoli C. Sustainable business models and artificial intelligence: Opportunities and challenges. Knowledge, people, and digital transformation: Approaches for a sustainable future. 2020 Apr 23:103-17. https://doi.org/10.1007/978-3-030-40390-4_8

[103] Kulkov I. Next-generation business models for artificial intelligence start-ups in the healthcare industry. International Journal of Entrepreneurial Behavior & Research. 2023 May 4;29(4):860-85. https://doi.org/10.1108/IJEBR-04-2021-0304

[104] Singh AK, Zhang Y, Anu. Understanding the evolution of environment, social and governance research: novel implications from bibliometric and network analysis. Evaluation Review. 2023 Apr;47(2):350-86. https://doi.org/10.1177/0193841X221121244

[105] Ding X, Sheng Z, Appolloni A, Shahzad M, Han S. Digital transformation, ESG practice, and total factor productivity. Business Strategy and the Environment. 2024 Jul;33(5):4547-61. https://doi.org/10.1002/bse.3718

[106] Paramesha M, Rane N, Rane J. Big data analytics, artificial intelligence, machine learning, internet of things, and blockchain for enhanced business intelligence. Artificial Intelligence, Machine Learning, Internet of Things, and Blockchain for Enhanced Business Intelligence (June 6, 2024). 2024 Jun 6. https://doi.org/10.2139/ssrn.4855856

[107] Carter D. How real is the impact of artificial intelligence? The business information survey 2018. Business Information Review. 2018 Sep;35(3):99-115. https://doi.org/10.1177/0266382118790150