

# Incorporation of AI into Ethical and Sustainable Investing Strategies and its Influence on Financial Results and Decision-Making Pathways

This article examines the integration of AI technologies into ESG investment strategies, highlighting their significant impact on decision-making processes and financial outcomes. The natural world for the social and economic communities to which it belongs. Over the years, ESG has moved from being a “nice to have” to a business must-have. And its importance will only continue today, tomorrow and in the future. Artificial Intelligence (AI) can make real-time decisions, automatically learn and adapt, and respond more accurately to events based on pre-configured algorithms and data analytics. Including the application of human factors and AI. AI is becoming a key tool to drive the interaction between financial performance and sustainable development goals.



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## INTRODUCTION

The integration of *Artificial Intelligence (AI)* with Environmental, Social and Governance (ESG) is fundamental to the evolution of today's business world. By integrating intelligence into ESG risk management and strategy, organizations can not only achieve sustainability goals, but also open up new ways to drive sustainability and innovation. The term environmental, social and governance (ESG) is often used interchangeably with sustainability and social responsibility. It refers to three important factors used to assess a company's sustainability and ethics. Using advanced data mining and machine learning algorithms, AI enables investors to analyze a wide range of ESG-related data, eliminate guesswork, and identify resources that will meet security goals. The application of AI-driven ESG analysis allows investors to create well-designed investments that not only target financial success but also follow ethical and moral safety principles. Using AI, investors can analyze the environmental impact, responsibility, and economic governance of investment opportunities. This approach helps in identify ESG risks and opportunities accurately and efficiently, leading to more informed investment decisions. AI also allows investors to update their portfolios in line with market changes and emerging market trends. By regularly monitoring ESG

and using predictive analytics, investors can manage risk and capture opportunities to improve the long-term performance of their portfolios. This strategic approach not only reduces ESG-related risks, but also allows investors to benefit from evolving markets and changes in consumer preferences. In addition, the integration of AI into ESG investments can support transparency, accountability, and stakeholder engagement across the investment ecosystem. AI-powered tools can help in disseminate information about ESG, allowing investors to make informed decisions that align with their profit and sustainability goals. By leveraging the power of AI, investors can leverage the power of AI to gain a competitive advantage while also increasing environmental and social impact. In summary, the use of AI in ESG investments represents a revolution in information management, providing investors with unprecedented opportunities to solve ESG challenges and achieve financial success. The importance of data management and performance improvement in ESG investments cannot be overstated. As investors become more aware of the importance of sustainability and corporate responsibility, the need for investment strategies that not only deliver returns but also contribute to environmental and social benefits is increasing. Good data management in ESG investments requires the creation of balanced data that includes a wide range of ESG factors, including climate change, social impact and ethics. Optimizing performance also requires a strong understanding of ESG-related risks and opportunities, as well as the ability to adjust investment strategies to business changes and security standards. Artificial intelligence (AI) is expected to play a transformative role in ESG investments by improving management and performance. AI encompasses many technologies, including machine learning, natural language processing, and predictive analytics, that enable computers to analyze large amounts of data and extract useful and decisive information. In the context of ESG investing, AI can help to analyze ESG-related information from a variety of sources (such as company reports, news, and social media) to identify investment opportunities, assess risk, and improve business allocation. Using AI-driven analysis, investors can gain

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a deeper understanding of ESG factors, improve their understanding of risks and opportunities, and become more informed about investment decisions. AI enables investors to create diverse investment opportunities that not only meet security objectives but also seek competitive financial returns. In essence, AI has the potential to revolutionize ESG investing by enabling investors to solve complex business problems, create positive impacts on the environment and society, and achieve financial success. The use of ESG standards is therefore a difficult task, facing issues related to data quality, integration with existing standards, management control, financial evaluation and communication between ESG objectives and stakeholders. Solving these problems requires the best possible approach, supported by a strict commitment to sustainable business practices.

## ESG STANDS FOR

### Environmental

The environmental process assesses the sustainability of a company's operations. It shows the organization's overall impact on the environment and the risks and opportunities it faces due to environmental issues such as climate change and measures to protect the natural layer of capital. Environmental factors that may meet ESG criteria include energy use and performance, carbon footprint (including carbon monoxide emissions), waste management, cloud air and water pollution, biodiversity loss, deforestation, depletion of natural resources, cleanliness and technology.

### Social

The social model measures how the company works for different groups of people (employees, customers, suppliers and communities) and its efforts to promote diversity, equity and inclusion. Procedures used include worker safety, product safety, human rights, child labor and other types of procedures.

### Governance

The governance aspects determine how the company manages itself and focus on internal controls and practices to comply with the law, business practices and company departmental policies. For example, payment arrangements, financial transparency and business integrity, compliance management and risk management, business practices and finance reporting. ESG has become increasingly important in recent years as more investors, customers and stakeholders demand that companies prioritize business development and accountability. This has led to a proliferation of ESG metrics and measurements used by investors and other stakeholders to evaluate companies on their ESG performance. One of the most important drivers is the shift in investors' preference for companies with good ESG performance. This is partly due to younger investors who are more likely to consider social and environmental issues when making investment decisions. Domestic investors such as pension funds and endowments have also increased their allocations to ESG investments, further helping to bring ESG investments

into the mainstream. The growth of ESG literature and research also contributes to mainstream acceptance. This helps to establish ESG criteria and makes it easier for investors to evaluate companies.

## INTEGRATION OF AI IN ESG

The adoption of AI in ESG investing is gaining significant acceptance as industry bodies and regulators, see the importance of incorporating AI-driven analytics into business practices. Financial institutions and asset management firms are integrating AI technology into their ESG investment processes, further strengthening the role of AI in improving business management and efficiency in the context of financial sustainability. The growth of AI in ESG investing continues as researchers and practitioners explore new applications of AI technology, such as educational support and collaborative learning, to solve sustainable business problems. Collaboration between AI experts, ESG researchers, and industry stakeholders can foster innovation and encourage the development of new AI-driven ESG investment tools and methodologies.

## TECHNOLOGIES POWERED BY AI FOR ESG INVESTING

Artificial intelligence (AI) technology has played a significant role in the transformation of Environmental, Social, and Governance (ESG) investing, providing intelligent tools to analyze large amounts of ESG-related data and improve decision-making. This chapter provides an overview of key scientific techniques such as machine learning, natural language processing, and predictive analytics, and examines their applications in ESG-related data analysis and improving ESG investment decisions. Machine learning is a branch of artificial intelligence that allows computers to learn from data and make predictions or decisions without being programmed. It has many algorithms, including supervised learning, unsupervised learning, and reinforcement learning. In ESG investing, machine learning algorithms can analyze historical data to identify patterns, trends, and relationships between ESG factors and financial performance. They can also predict future outcomes and develop investment strategies based on analysis of ESG-related information. Natural language processing is a field of artificial intelligence that focuses on enabling computers to understand, interpret, and reproduce human language. It includes techniques such as hypothesis testing, topic modeling, and source recognition. In ESG investing, NLP technology can analyze unstructured data from sources such as company reports, news and social media to uncover insights about environmental performance, social impact and governance practices. NLP can also analyze stakeholder sentiment and identify emerging ESG trends and conflicts. Forecasting involves the use of statistical techniques and machine learning algorithms to analyze historical data and predict future events or outcomes. It includes techniques such as regression analysis, time estimation, and classification. Forecasting in ESG investing can estimate the impact of ESG factors



on financial performance, assess the potential impact of ESG-related risks, and determine working capital based on security objectives. It can also help investors adjust their investments according to changing economic and ESG trends. AI technology can collect, aggregate, and process ESG-related information from a variety of sources, including corporate reports, regulatory information, news, and social media. They enable analysis of ESG factors by managing both standard and non-standard data. AI algorithms can analyze ESG-related data to identify patterns, relationships, and anomalies. They can provide insight into environmental performance, social impact, and governance practices, helping investors understand the sustainability of companies and businesses. AI-powered visualization tools present ESG-related data in intuitive, interactive dashboards, allowing investors to explore trends, compare performance metrics, and make informed decisions based on data. AI technology is enabling investors to make investment decisions using more ESG-related information. By analyzing ESG factors using machine learning algorithms and predictive analytics, investors can identify investment opportunities, assess risk, and optimize market allocation accordingly. AI-driven analysis of ESG factors can improve risk management for ESG investments. Machine learning algorithms identify and analyze ESG-related risks, such as climate change, product disruptions, and regulatory changes, allowing investors to mitigate risk and protect their data from decline. AI technology helps investors develop business strategies with sustainable goals by providing insights into the environmental, social, and operational management of companies and businesses. By integrating AI-powered analytics into data management processes, investors can create balanced portfolios that aim to generate financial returns while driving positive environmental and social benefits.

## LEVERAGING AI TO IMPROVE PORTFOLIO MANAGEMENT

Corporate governance is an important part of the business environment; social and governance (ESG) investments and the integration of artificial intelligence (AI) are important to improve data development, optimization and management processes. AI-based data analytics enable investors to use large amounts of ESG-related data to inform their decisions. Machine learning algorithms can analyze historical data on environmental performance, social impact and governance practices to identify opportunities and risks. AI algorithms can create quantitative models that combine ESG factors with traditional financial metrics to create balanced investments. This model optimizes the segmentation of the business according to security objectives, risk and financial objectives, ensuring compliance with ESG principles. AI-powered data analytics help to improve risk management data by identifying and assessing ESG-related risks. AI algorithms help to improve business efficiency through continuous business analysis, ESG-related data, and performance indicators. Machine learning models can instantly adjust data distribution based on market changes, stable markets, and market trends. AI-driven scenario analysis and allows investors to evaluate the impact of ESG variables on portfolio performance. Machine learning algorithms can simulate various events, such as climate change or regulatory change, to analyze their impact on returns and risk profiles and demonstrate revolutionary change. AI algorithms can perform multi-objective optimization to balance financial returns in construction materials, reduce risk, and ESG decisions. Machine learning models can optimize distribution across multiple dimensions,



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such as profitability, stability, and risk, to achieve desired investment outcomes. AI technology can integrate ESG factors into strategic management strategies through systems and processes. Machine learning algorithms can rank companies based on ESG performance, identify ESG leaders and laggards, and generate diverse data that drives sustainability. AI-powered ESG risk management tools help investors to assess and mitigate ESG-related risks in portfolio management. Natural language processing can analyze data from company publications, news and social media to identify ESG conflicts, governance concerns and reputational risks that will bring about changes. AI-powered impact assessment tools enable investors to identify and report the environmental and social impacts of their portfolios to assess the positive and negative external benefits created by capital investment, promoting transparency and accountability for stakeholders.

## BOOSTING PERFORMANCE WITH AI-DRIVEN ESG ANALYSIS

In the world of Environmental, Social, and Governance (ESG) investing, Artificial Intelligence (AI) plays a key role in identifying ESG-related risks and opportunities, using predictive analytics to improve investing, and demonstrating the real-world impact of data recovery. This section explains how AI-driven ESG analytics can improve investing by focusing on identifying ESG-related risks and opportunities, using predictive analytics, and world-class case studies that demonstrate the effectiveness of AI in ESG investing. AI-driven data analytics enable investors to analyze ESG-related information from a variety of sources, including corporate reports, regulatory documents, news, and social media. Machine learning algorithms can process structured and unstructured data to identify patterns and inconsistencies related to work environments, social interactions, and practices. AI algorithms can determine the context and significance of data related to ESG risk. Natural language processing enables computers to analyze information about ESG conflicts, violations, and reputational risks related to a company, trade, or business, allowing investors to better understand risks that could impact performance. AI-driven analytics can help investors to identify ESG-related opportunities that align with sustainable development and business success. Machine learning algorithms analyze historical data to identify predictive patterns and indicators that could impact asset prices, allowing investors to make informed decisions and provide insights into their information. Predictive analytics can help investors to anticipate and mitigate ESG-related risks before they arise. Machine learning models predict the impact of changes in environmental policies, social policies, and governance on company performance, allowing investors to adjust their records and minimize the risk of falling behind. Predictive analytics optimize portfolio performance by identifying investments with attractive returns. Machine learning algorithms can analyze ESG-related data to identify assets, growth markets, and sustainable business contexts, and guide investors to opportunities that provide competitive financial returns while adhering to ESG principles.

AI has become a powerful tool in ESG investing that allows investors to analyze big data, identify ESG implications, and make informed investment decisions.

## ENHANCING TRANSPARENCY AND ACCOUNTABILITY IN ESG INVESTING THROUGH AI

Transparency and accountability are cornerstones of ESG (environmental, social and governance) investing, providing investors with access to better information and holding companies accountable for their best practices. As artificial intelligence (AI) is integrated into ESG investing, there is a significant opportunity to increase transparency and accountability across all aspects of investment decisions. Transparency in ESG reporting and disclosure is crucial for investors to make informed decisions about the environmental and social impacts of their investments. AI can play a key role in transparency through data collection, analysis and reporting. AI-powered algorithms can sift through a variety of irrelevant information from a variety of sources, including company announcements, news media and social media, to extract ESG-relevant information. Natural language processing (NLP) technology enables smart machines to understand and interpret data and identify ESG indicators and key trends. AI-driven predictive analytics can increase confidence in ESG investments by providing investors with comprehensive and up-to-date information on companies' sustainable practices. Stakeholder engagement is essential for transparency and accountability in ESG investing. AI-powered tools can facilitate communication between investors, companies, and other stakeholders, enabling effective communication and collaboration across security issues. Chat bots and virtual assistants powered by AI technology can engage with stakeholders, answer questions, provide information, and guide them through the ESG reporting process. These tools can improve communication lines, making it easier for investors to engage with companies and obtain relevant ESG information. Additionally, intelligence-driven feedback tools can monitor social media and news platforms to assess public perception of a company's sustainability efforts, providing positive feedback to both investors and companies. Stakeholders can collaborate on ESG projects using AI-powered communication tools, thereby increasing transparency and accountability across the investment ecosystem. Accreditation and adherence to ESG standards are crucial to maintaining the integrity of ESG investments. AI-driven analytics can help investors assess a company's compliance with ESG standards and identify potential areas for improvement. Machine learning algorithms can

analyze historical data to identify patterns and trends in a company's ESG performance, flagging gaps or anomalies that may indicate non-compliance with ESG standards. Additionally, intelligence assessment tools that can assess companies' ESG risks, such as environmental liability or conflict, are helping investors make more informed decisions about their investments. Using AI-powered analytics, investors can hold companies accountable for their sustainability practices and encourage them to be transparent and accountable.

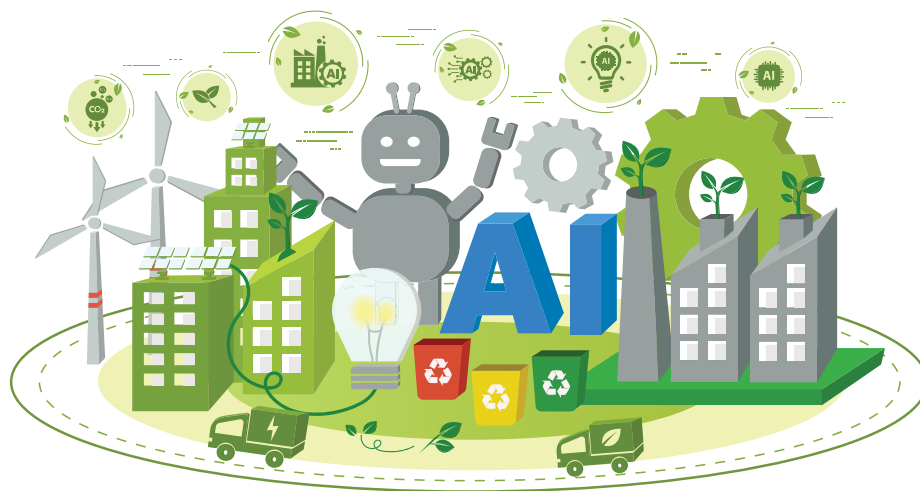
## OBSTACLES AND FACTORS TO CONSIDER

Artificial intelligence (AI) is revolutionizing Environmental, Social and Governance (ESG) investing by improving governance and performance. However, there are challenges and decisions that need to be addressed to ensure the effective and ethical use of AI in ESG investments. This section examines issues related to data quality and integrity, ethical considerations and biases in artificial intelligence algorithms, regulatory compliance and privacy issues. One of the main challenges in AI-driven ESG analytics is the availability and accessibility of good ESG-related data. While more ESG information is available, the quality, consistency and scope of this information vary across companies and sectors. Limited data availability can compromise the accuracy and reliability of AI-driven ESG analysis, which can lead to incomplete or misleading results. Ensuring the accuracy and reliability of ESG data used in artificial intelligence-driven analyzes is critical for investment decisions. However, ESG data may contain errors, inconsistencies, or gaps that could affect the integrity of AI algorithms and the validity of their predictions. Data analysis techniques and robustness measures are necessary to overcome these challenges and increase the reliability of AI-driven ESG analysis. Integrating and modeling disparate ESG data is a major challenge for AI-driven ESG analysis. Different companies and organizations use different reporting models, metrics and methods to measure and present ESG-related data this makes it difficult to compare and analyze data across companies and businesses. The development of data modeling and collaboration platforms can facilitate data integration and improve the results of AI-driven ESG analysis. AI algorithms used in ESG investing may be biased based on the training data and assumptions included in the model. Unfair algorithms can lead to inequality, discrimination, and injustice, leading to negative and ethical consequences. Ensuring algorithmic integrity and reducing bias requires rigorous testing, validation, and transparency in AI model design and deployment. The complexity of AI algorithms creates challenges in understanding how decisions and recommendations are made. Lack of explanation and disclosure in AI models can increase concerns about accountability and transparency, preventing stakeholders from trusting and using the results. Improving the explanation of AI algorithms through transparent models, explanation of AI processes, and explanatory frameworks can address these issues and increase trust in AI-driven ESG analysis. AI-driven ESG analysis involves processing large and proprietary data, including financial

data, employee data, and customer data. Ensuring the privacy and confidentiality of personal information is essential to protecting individual rights and complying with regulatory requirements. Implement strong data protection, encryption technology, and access controls to protect privacy and reduce the risk of data leakage and misuse. Transparency, disclosure, and accountability. AI-driven ESG analysis must comply with applicable regulations, including data protection regulations, security regulations, and industry-specific guidance. The implementation of environmental management should be continuously monitored, updated, and followed up with the efforts of AI-driven ESG investment companies. AI-driven ESG analysis involves the collection, processing, and analysis of large amounts of personal and sensitive data, raising privacy and data protection concerns. Protecting privacy requires privacy by design, anonymization of sensitive information, and obtaining informed consent from the data subject. Addressing privacy concerns is critical to building trust with stakeholders and reducing the risk of regulatory penalties and reputational damage. Transparency and disclosure are fundamental principles of ESG investing, ensuring accountability and increasing investor confidence. AI-focused ESG analytics companies should make their processes, resources, and perspectives available to stakeholders, allowing them to assess the validity and credibility of the AI-focused vision. Improved transparency and disclosure practices can support greater accountability, stakeholder engagement, and regulatory compliance in AI ESG investing.

## POTENTIAL PATHS AND OPPORTUNITIES AHEAD

*Artificial Intelligence (AI)* promises to revolutionize Environmental, Social, and Governance (ESG) investing by improving governance and performance. As AI technology continues to advance, several future directions and opportunities emerge in the AI-driven ESG investing space. This section examines emerging trends in AI technology for ESG investing, the potential for greater innovation and integration of AI Artificial Intelligence (AI) promises to revolutionize environmental, social, and governance (ESG) investing by improving governance and performance. As AI technology continues to advance, several future directions and opportunities emerge in the AI-driven ESG investing space. This section examines emerging trends in AI technology for ESG investing, the potential for greater innovation and integration of AI in data management, and opportunities for collaboration and cooperation to drive AI-driven ESG investment initiatives. NLP should play a significant role in ESG investing by enabling computers to analyze and interpret raw data from a variety of sources, including news, social media and corporate events. Advanced NLP algorithms can extract insights from large amounts of data, providing investors with valuable information about a company's ESG performance, conflicts, and the stakeholders most affected. Deep learning techniques, such as neural networks and deep learning, are increasingly used in ESG investing to analyze complex data and identify patterns,



relationships, and anomalies. In-depth studies can reveal the relationship between ESG factors and financial performance, allowing for more accurate estimation of investment risks and opportunities in ESG data. Descriptive AI is growing in popularity in ESG investing as investors seek greater clarity and explanation in AI-driven decisions. AI technology enables stakeholders to understand how AI models arrive at predictions and recommendations, thereby increasing trust and confidence in AI-driven management strategies. - Develop risk management-driven intelligence tools to enable investors to effectively assess and mitigate ESG-related risks. Model the impact of data on performance and implement risk mitigation strategies. AI technology provides a way to create personalized portfolios based on investor-preferred ESG, risk appetite, and financial goals. Using machine learning algorithms and predictive analytics, investment firms can tailor ESG information to meet the unique needs and preferences of their clients, enabling investors to leverage and collaborate more effectively. The future of AI in data management will include the development of autonomous decision-making systems that use AI to make business decisions, remarket information, and develop investment strategies. Autonomous AI-powered systems can instantly adapt to business changes, ESG trends, and investor preferences to increase efficiency and effectiveness. Collaboration between financial institutions, technology companies, research organizations, and regulators is vital to foster innovation and implement AI-driven ESG investments. By sharing data, expertise, and resources, stakeholders can accelerate the development and use of AI technology in ESG investing and collaboration and solve different problems. Public-private partnerships (PPPs) provide an opportunity to leverage government resources and expertise to support AI-focused ESG investment initiatives. Governments can support AI research, fund pilot projects, and develop regulatory frameworks to support the role of AI in the financial industry and encourage public-private partnerships. Collaboration between finance and other sectors, such as technology, education, and nonprofits, can facilitate knowledge exchange, innovation, and capital formation for AI-

focused ESG investments. Joint ventures can benefit and transform investors, businesses, and society as a whole through the use of diverse perspectives and resources.

## CONCLUSION

In summary, artificial intelligence (AI) promises to revolutionize Environmental, Social, and Governance (ESG) investing by improving governance and performance. In the discussion, we explore the importance of AI in improving ESG investment practices, identify key insights, and discuss implications for the future of financial stability. Let's now examine the importance of AI in ESG investing, summarize key points, and offer a call to action to continue exploring and using AI technology in ESG investing to ensure financial stability. AI has become a powerful tool in ESG investing that allows investors to analyze big data, identify ESG implications, and make informed investment decisions. By leveraging AI-powered analytics and machine learning algorithms, investors can improve business management, reduce risk, and improve financial performance while adhering to ESG principles and goals. AI enables investors to integrate sustainability considerations into their investment strategies, generating financial returns while delivering social and environmental benefits. The integration of AI into ESG investing offers a number of benefits, including improved risk management, personal development, and enhanced decision-making. AI technology enables investors to solve complex ESG issues, uncover hidden opportunities, and effectively respond to emerging risks. However, the intellectual work in ESG investing also presents challenges, such as good data issues, ethical considerations, and compliance. Overcoming these challenges requires collaboration, innovation, and a commitment to responsible technology adoption. As the demand for sustainable investing continues to grow, ESG investments are urgently needed to continue exploring and implementing smart technologies. Marketers, financial institutions, technology companies, and regulators must collaborate to develop new AI solutions, ensure transparency and accountability, and promote the measurement of financial stability. By harnessing



the power of AI, we can unlock new opportunities for sustainable financial success, drive positive change, and create better relationships and relationships for everyone in the future. In short, AI has the potential to transform ESG investing, improve business management and efficiency, and increase financial success. By leveraging technology and data from insights, we can make progress toward a better, more efficient financial world for traders, businesses, and people. Integrating AI into sustainable development and ESG practices presents both opportunities and challenges. While AI has great potential to create positive change through resource optimization, renewable energy management, cloud computing, and ESG transparency, it still needs to be mindful of data privacy, bias, ethical issues, and accessibility. By encouraging collaboration, building equity, partnering with partners, and conducting continuous research, people can shape the path for AI to become a powerful tool for creating a more productive and balanced future. In summary, it is important to recognize that the complexity of financial intelligence depends on its relationship with other financial technologies (FinTechs), including block chain, cloud computing, big data, and the Internet of Things (IoT).

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