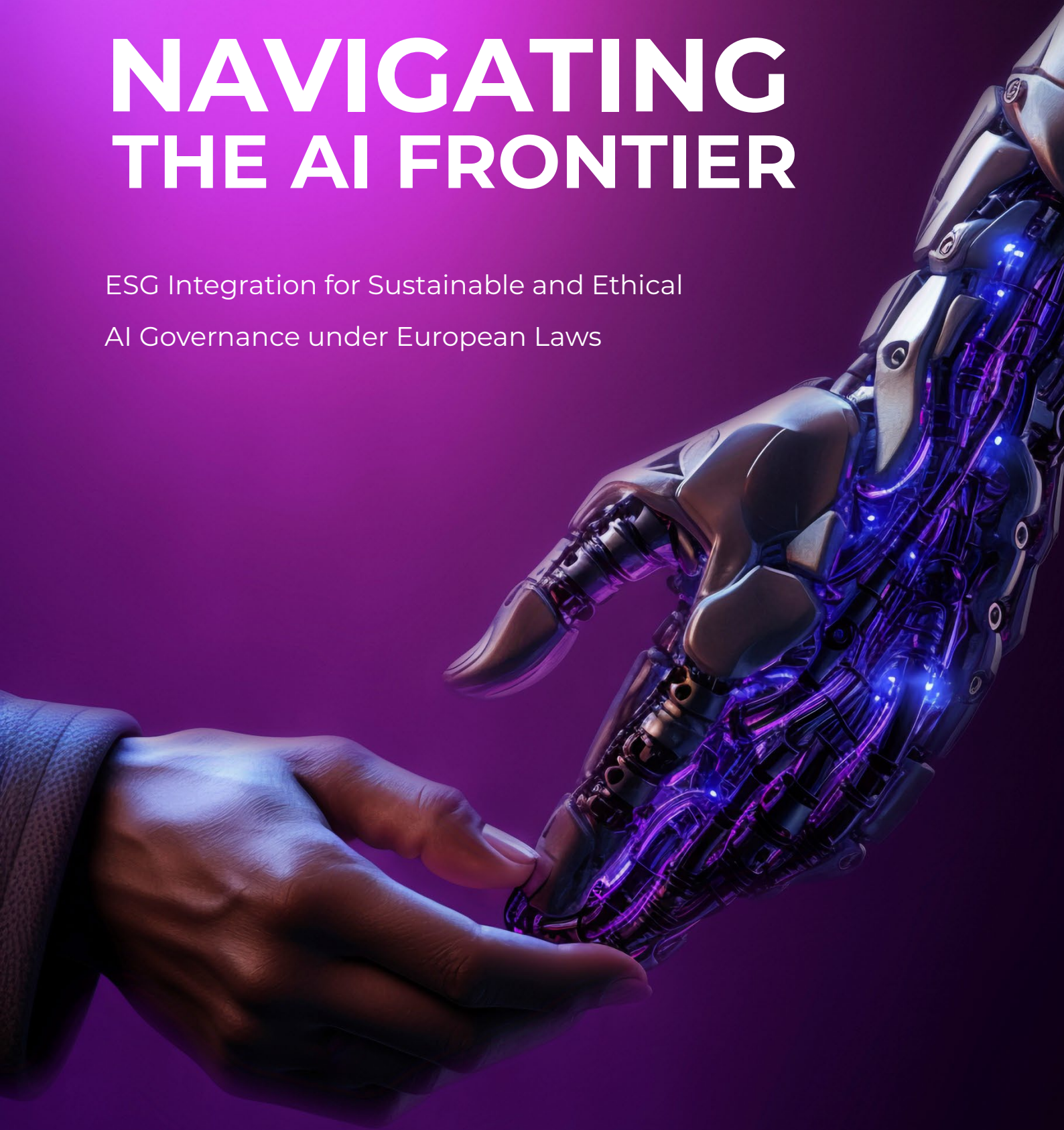


NAVIGATING THE AI FRONTIER

ESG Integration for Sustainable and Ethical
AI Governance under European Laws



Abstract

Artificial Intelligence (AI) reshapes industries and presents unprecedented opportunities and significant challenges. This article discusses the integration of Environmental, Social, and Governance (ESG) principles into AI governance in Europe, analysing the current trends, challenges, and the profound implications of the AI Act and ESG laws. It also includes a practical example of a bank successfully implementing these principles.

Introduction

Artificial Intelligence is not merely a technological advancement but a transformative force reshaping industries worldwide. It offers unprecedented opportunities and significant challenges, making it a topic of utmost importance and urgency. In Europe, the integration of Environmental, Social, and Governance principles into AI governance is gaining momentum, further underlining the significance of this discussion.

This article delves into the current trends and challenges in AI governance, the integration of ESG principles, and the implications of the AI Act and ESG laws in Europe. It also provides a tangible example of a bank that has implemented and effectively implemented these principles, demonstrating their practical application and inspiring confidence in their effectiveness.

Historical Context of ESG

The concept of ESG, which emerged in the early 2000s, serves as a framework for considering environmental, social, and governance factors in investment decisions. Initially driven by ethical considerations, it has evolved into a mainstream approach recognised for its potential to enhance financial performance and mitigate risks, providing a solid foundation for integrating these principles into AI governance.

The EU has pioneered ESG regulation, starting with the Non-Financial Reporting Directive (NFRD) in 2014. To transform the EU into a modern, resource-efficient, and competitive economy and address climate change and environmental degradation, the EU has approved the Green Deal, aiming for no net emissions of greenhouse gases by 2050, economic growth decoupled from resource use, and that no person and no place is left behind. Comprehensive ESG regulations were introduced to meet such goals, including the Corporate Sustainability Reporting Directive (CSRD) and the Sustainable Finance Disclosure Regulation (SFDR), which mandate extensive ESG reporting and compliance. These regulatory developments are crucial to understand, as they profoundly impact any business professional, policymaker, or stakeholder interested in AI governance and ESG integration in Europe.

Environmental Impact of Advancing AI

AI technologies, particularly large-scale machine learning models and deep learning algorithms require substantial computational power, leading to significant energy consumption. Data centres, which house the servers and infrastructure needed for AI processing, consume vast amounts of electricity. According to a study by the University of Massachusetts Amherst, training a single AI model can emit as much carbon as five cars in their lifetimes (Strubell et al., 2019).

The carbon footprint of AI is a growing concern. Data centres that power AI applications often rely on non-renewable energy sources, contributing to greenhouse gas emissions. The high energy demand for cooling systems and constant operation exacerbates this impact. Google has attempted to mitigate this by using advanced cooling technologies and pledging to run its data centres on carbon-free energy by 2030 (Google Sustainability, 2020).

AI development relies heavily on hardware such as GPUs (Graphics et al.) and specialised AI chips, which require rare earth metals and other non-renewable resources. The extraction and processing of these materials have significant environmental impacts, including habitat destruction and pollution. As AI technology advances, the demand for these materials will increase, raising concerns about sustainability and environmental degradation.

The rapid development and deployment of AI technologies contribute to the growing problem of electronic waste (e-waste). The short lifecycle of AI hardware and the need for continuous upgrades to maintain competitive performance lead to the disposal of large quantities of electronic devices. Improper disposal and recycling of e-waste can result in hazardous materials contaminating soil and water sources (Forti et al., 2020).

The AI Act and ESG Laws in Europe

The AI Act, a landmark regulation adopted by the European Parliament in 2024, is a significant step towards fostering the development and uptake of safe and trustworthy AI systems across the EU. The Act categorises AI systems into four risk levels and imposes strict requirements on high-risk applications.

Overview of ESG Regulations

The EU's ESG regulations, including the CSRD, mandate extensive ESG reporting and compliance, profoundly impacting business professionals, policymakers, and stakeholders.

Europe has several robust frameworks addressing ESG considerations, including:

1. The Corporate Sustainability Reporting Directive (CSRD) Requires large companies to disclose information on operating and managing social and environmental challenges.
2. EU Taxonomy Regulation: Establishes criteria to determine whether an economic activity is environmentally sustainable.
3. Non-Financial Reporting Directive (NFRD): Large companies must include non-financial statements in annual reports.
4. Sustainable Finance Disclosures Regulation (SFDR): Financial market participants, including banks, insurance companies, asset managers, and pension funds, shall disclose information about their ESG policies, risks, impacts, and performance at both the entity and product levels.
5. The Corporate Sustainability Due Diligence Directive (CSDDD) Sets rules for sustainable and responsible corporate behaviour in companies' operations and across their global value chains.
6. The European Sustainability Reporting Standards Regulation (ESRS) sets standards for companies' sustainability reporting.

These frameworks aim to increase transparency, promote sustainable business practices, and protect stakeholders' interests. The AI Act attempts to integrate with these existing frameworks by ensuring that High-risk AI systems comply with transparency and accountability standards similar to those in the CSRD and NFRD and promoting the development and use of AI systems that support environmental sustainability, aligning with the goals of the EU Taxonomy Regulation.

Evolution of Environmental and ESG Provisions in the AI Act

The initial drafts of the AI Act included comprehensive environmental and ESG obligations. These drafts mandated that all AI systems, regardless of their risk category, comply with strict ESG criteria. Specific requirements included:

- a. Conducting environmental impact assessments for AI systems.
- b. Mandatory reporting on energy consumption and carbon footprint.
- c. Incorporating lifecycle assessments to evaluate environmental impacts from development to disposal. These provisions aimed to ensure that AI development and deployment were aligned with the EU's broader sustainability goals, such as those outlined in the European Green Deal.

During the legislative process, significant revisions were made to the AI Act. The stringent environmental and ESG requirements faced pushback from various stakeholders, including industry representatives, who argued that the broad applicability of these mandates would be overly burdensome and could stifle innovation. Consequently, the final approved version of the AI Act focused ESG obligations primarily on high-risk AI systems, making compliance for other AI applications voluntary rather than mandatory.

However, the latest AI Act text reflects this shift towards a more flexible, risk-based approach. This approach allows developers of lower-risk AI systems to voluntarily adopt ESG practices without the stringent regulatory oversight initially proposed. The revised focus aims to balance the need for innovation with the importance of sustainable and ethical AI development.

This shift in focus raises concerns about the AI Act's potential effectiveness in promoting environmental sustainability. By making ESG compliance voluntary for non-high-risk AI systems, the Act may result in inconsistent application of environmental standards and reduce overall accountability. This could undermine the EU's efforts to integrate sustainability into AI governance comprehensively.

While the AI Act includes provisions for managing high-risk AI systems, it falls short of addressing comprehensive environmental impacts across all AI applications. The act's voluntary approach to non-high-risk AI systems could lead to inconsistent application of environmental standards, resulting in missed opportunities for mitigating the broader environmental footprint of AI technologies.

The AI Act does not mandate detailed reporting on all AI systems' energy consumption or carbon footprints. As a result, companies may lack incentives to adopt energy-efficient practices or reduce their carbon emissions, potentially exacerbating AI's environmental impact.

It also fails to address the lifecycle impacts of AI hardware, such as resource depletion and e-waste management. Without stringent regulations, companies might overlook the importance of sustainable materials sourcing and proper disposal of outdated hardware.

The AI Act's focus on high-risk AI systems means that the social impacts of many AI applications may not be adequately addressed. This includes the potential for AI to exacerbate digital divides, create job displacement, and perpetuate biases and discrimination.

While the AI Act has all these deficiencies, the European Financial Reporting Advisory Group (EFRAG) has developed ESG reporting standards for the CSRD, known as the European Sustainability Reporting Standards (ESRS). It remains to be seen whether a selection of these standards could be applied to AI systems to ensure consistency and thorough reporting.

Practical Case Study: Test Bank

To illustrate the practical implementation of AI and ESG principles, we consider the example of a hypothetical bank, Test Bank, a financial institution leveraging high-risk AI systems for credit scoring, fraud detection, and investment advice.

In the first year of the EU AI Act's application, along with the SFDR and CSRD, Test Bank undertakes comprehensive measures to comply with these regulations and align its operations with ESG principles throughout the lifecycle of its high-risk AI systems. This mini-study exclusively focuses on ESG parameters.

1. Year 1: Initial Compliance Phase. Test Bank must assess and implement compliance with the AI Act, establish a robust Risk Management process, prepare all the required documentation, and meet transparency and audibility requirements.
 - a. Risk Management:
 - Action: Test Bank conducts a comprehensive risk assessment of its high-risk AI systems. This includes evaluating potential algorithmic discrimination and assessing energy efficiency. The bank documents all data sources used in AI training and establishes procedures for continuously monitoring and updating these systems.
 - Challenges: The initial risk assessments might reveal biases in the AI systems used for credit scoring, particularly affecting minority groups.
 - Mitigation: Test Bank implements corrective measures, such as retraining AI models with more diverse data sets and optimising their algorithms for energy efficiency.
 - b. Transparency and Accountability:
 - Action: The bank updates its customer interface to ensure transparency in AI decision-making processes. Customers are informed when AI systems are used in credit scoring, including details on data factors considered and how decisions are made.
 - Challenges: Ensuring all customers understand the AI processes and can contest decisions proves complex.
 - Mitigation: Test Bank launches a customer education campaign, explaining AI use in simple terms and providing an easy-to-use platform for contesting decisions.
2. Test Bank will also need to assess and implement compliance with the SFDR and CSRD, ensuring its sustainability disclosure is in line, the reporting mechanisms are in place, and there is audibility and public disclosure.
 - a. SFDR & Sustainability:
 - Action: On a corporate level, Test Bank shall prepare the double materiality assessment to set the foundation for their strategic planning, budget allocation, risk management, and annual reporting. Once done, ESG shall be integrated into Strategic Planning, Risk Management and Governance. Metrics shall be collected and analyses and targets shall be set to evaluate ESG performance.
 - On the product level, Test Bank integrates ESG criteria into its investment decision processes and discloses this information to potential investors. This involves detailing how environmental, social, and governance factors are considered in investment portfolios. Categorisation of the products based on SFRD.
 - Challenges: The double materiality assessment shall provide a fair bank overview. On a product level, aligning existing investment products with new ESG criteria requires significant adjustments and resources.
 - Mitigation: The bank establishes a department focusing on ESG compliance and collaborates with experts to establish the foundations of the ESG strategy, especially regarding the double materiality assessment. The bank redesigns its investment products to include ESG benchmarks and begins a phased rollout of these new products to investors.

b. SFDR & Reporting:

- Action: Test Bank publishes an annual sustainability report highlighting how ESG considerations influence its operations and investment strategies.
- Challenges: Collecting and verifying the data required for these reports is time-consuming, especially when verifying and collecting data from the value chain. The data shall be analysed from the perspective of the set targets.
- Mitigation: The bank implements new data collection and analysis tools to streamline the reporting process and ensures that the business partners in the value chain are sharing such data and information and aligning with such concepts
- Challenges: The detailed nature of CSRD reporting standards requires significant investment in new reporting systems and processes.
- Mitigation: Test Bank invests in advanced ESG reporting software and collaborates with external consultants to ensure compliance.

c. CSDR Audits and Public Disclosure:

- Action: The bank conducts internal audits to ensure the accuracy of its ESG reports and makes these reports publicly available to stakeholders, including investors, customers, and regulatory bodies.
- Challenges: Ensuring all bank and value chain departments comply with the new reporting standards is challenging.
- Mitigation: Test Bank establishes a central ESG compliance team to oversee the integration of CSRD requirements across all departments.

3. Following year one and the implementation as captured above, Test Bank will also need to adopt continuous Improvement and adaptation throughout the high-risk AI's live cycle.

a. Risk assessment:

- Action: Test Bank continues to monitor its AI systems for compliance with the AI Act and makes necessary adjustments to mitigate any newly identified risks. This includes updating algorithms to reduce bias and improve energy efficiency.
- Challenges: Keeping up with evolving AI technologies and regulatory updates requires continuous learning and adaptation.
- Mitigation: The bank implements a continuous training program for its AI and compliance teams, ensuring they stay updated with the latest best practices and regulatory changes.

b. Stakeholder Engagement:

- Action: The bank enhances its engagement with stakeholders by regularly consulting customers, civil society organisations, and regulatory bodies to gather feedback and improve AI governance practices.
- Challenges: Balancing the interests and feedback from a diverse group of stakeholders.
- Mitigation: Test Bank establishes a stakeholder advisory board to provide ongoing input and oversight on its AI and ESG practices.

4. The Test Bank must also enhance compliance with the SFDR and CSRD.

a. Advanced ESG strategies:

- Action: Test Bank reviews its double materiality assessment and continuously monitors the supply chain and product performances. These actions will help refine its investment strategies to align more closely with ESG goals, prioritising investments in sustainable technologies and companies with strong environmental and social practices.
- Challenges: Identifying and assessing the ESG performance of the bank itself and of the potential investments.
- Mitigation: The bank partners with ESG rating agencies and uses advanced analytics to evaluate potential investments.

b. Impact Assessments:

- Action: The bank conducts detailed impact assessments for new investment products, ensuring they meet the stringent requirements of SFDR and contribute positively to sustainability goals.
- Challenges: Measuring the long-term impact of investments on ESG outcomes.
- Mitigation: Test Bank adopts advanced impact measurement frameworks and tools to provide accurate and comprehensive assessments.

c. Robust and enhanced Reporting and Transparency:

- Action: Test Bank reviews develop more sophisticated reporting mechanisms to provide granular details on ESG performance, utilising advanced data analytics to track progress and identify areas for improvement.
- Challenges: Ensuring the accuracy and reliability of data used in ESG reports, with particular regard to the supply chain
- Mitigation: The bank implements robust data verification processes and third-party audits to ensure the credibility of its reports.

d. Regulatory Alignment:

- Action: Test Bank ensures its reporting practices align with evolving regulatory standards under CSRD, maintaining transparency and accountability in all its operations.
- Challenges: Adapting to frequent changes in regulatory requirements.
- Mitigation: The bank establishes a regulatory watch team to monitor and respond to new regulations promptly.

Adhering to the above ESG frameworks will not be easy, as manifested above. The AI Act and CSRD require extensive transparency and reporting on AI systems and ESG performance. Test Bank must factor in potentially overlapping AI Act and CSRD requirements. For instance, both the AI Act and CSRD mandate transparency and reporting, but the specifics may differ, leading to potential confusion and overlapping work. The AI Act's environmental mandates are less specific than those in CSRD. This could lead to inconsistent implementation of environmental standards within AI systems when Test Bank tries to apply a streamlined approach to comply with all these regulatory obligations. Risk management could also be problematic, as the AI Act and CSRD emphasise risk management, particularly regarding environmental impacts.

Test Bank will need to align its risk management practices with both sets of regulations, adopting a comprehensive risk management framework that covers all aspects required by the AI Act and CSRD. Including the AI Act in the Test Bank will require more regulatory oversight and a more nuanced look at ESG, adding complexity and increasing compliance costs and administrative burdens. While the AI Act still addresses ESG principles, the dilution of mandatory obligations in the latest text might limit the effectiveness of these measures.

To ensure consistent and thorough ESG reporting, Test Bank should consider integrating selected European Sustainability Reporting Standards (ESRS) into the AI governance framework and adopting all relevant ESRS metrics for AI systems to ensure comprehensive ESG reporting. This alignment will help companies adhere to standardised reporting practices and provide stakeholders with reliable information on AI's environmental and social impacts.

Leveraging existing industry standards for enhanced governance could also be beneficial. AI governance is rapidly evolving, with new trends and challenges emerging in 2024. Notable trends include the development of customisable, lightweight, and open-source AI models and growing collaboration between government agencies and the private sector to tackle complex issues. For instance, the European Commission's AI-on-demand platform fosters collaboration by providing a shared resource for AI tools and datasets.

In 2024, notable trends in AI governance include the development of customisable, lightweight, and open-source AI models and increased collaboration between government agencies and the private sector. The European Commission's AI on-demand platform is a crucial example of fostering such collaboration.

The applicable governance models must also integrate ESG principles into AI governance frameworks. This ensures responsible and sustainable AI practices, helps manage environmental impacts, promotes social responsibility, and ensures robust governance structures. This integration can significantly enhance corporate reputation, attract investment, and ensure compliance with regulatory requirements. For example, Microsoft has committed to becoming carbon-negative by 2030, partly by integrating ESG principles into its AI operations. A study by the World Economic Forum found that companies with strong ESG performance tend to have better financial performance and lower risk profiles.

Industry standards, such as ISO 42001, can play a critical role in enhancing AI governance and addressing the shortcomings of the AI Act. ISO 42001 provides guidelines for the responsible development and deployment of AI systems, focusing on transparency, accountability, and sustainability.

Possible solutions

Applying the applicable ESRS to AI systems can significantly enhance transparency, accountability, and risk management. By providing a structured approach to ESG reporting, ESRS ensures that organisations meet regulatory requirements and build trust with stakeholders. Integrating ESRS with ISO 42001 can provide a comprehensive governance framework for AI, addressing the specific needs of AI management and the broader requirements of ESG reporting.

While ISO 42001 focuses on the responsible development and deployment of AI systems, ESRS provides a detailed framework for reporting on all aspects of ESG performance. Together, these standards can help organisations navigate the complexities of AI governance and sustainability, ensuring they meet regulatory requirements and promote ethical and sustainable practices.¹⁵ Practical Steps for Implementation.

To effectively integrate ESRS and ISO 42001 into AI governance, organisations should follow a structured approach that includes the following steps:

- (a) Conduct a Gap Analysis
Perform a comprehensive gap analysis to identify areas where current practices fall short of ESRS and ISO 42001 requirements. This analysis should cover all ESG reporting and AI management aspects, including transparency, accountability, and sustainability.
- (b) Develop an Implementation Plan
Based on the gap analysis, develop a detailed implementation plan that outlines the steps needed to achieve compliance with ESRS and ISO 42001. This plan should include timelines, resource requirements, and key performance indicators (KPIs) to track progress.
- (c) Establish Governance Structures
Create governance structures defining ESG reporting and AI management roles and responsibilities. This includes appointing dedicated teams or individuals to oversee compliance with ESRS and ISO 42001 and ensuring they have the necessary authority and resources.
- (d) Train Employees
Train employees on ESRS and ISO 42001 requirements, emphasising transparency, accountability, and sustainability. This training should be tailored to different organisational roles, ensuring all employees understand their responsibilities.
- (e) Implement Reporting Systems
Develop or enhance reporting systems to capture the data required for ESRS and ISO 42001 compliance. This includes implementing tools and processes for data collection, analysis, reporting, and ensuring data accuracy and integrity.
- (f) Monitor and Review
Monitor and review progress towards ESRS and ISO 42001 compliance regularly. This includes conducting internal audits, reviewing KPIs, and making necessary adjustments to the implementation plan. Continuous improvement should be a key focus, with lessons learned from each review cycle informing future actions.

(g) Leveraging Technology for ESG Reporting

Technology can be crucial in streamlining ESG reporting and ensuring compliance with ESRS and ISO 42001. Organisations should consider the following technological solutions:

- AI and Machine Learning: AI and machine learning are used to automate data collection and analysis for ESG reporting. These technologies can help identify patterns and trends, providing valuable insights into ESG performance and areas for improvement.
- Blockchain: Implement blockchain technology to enhance transparency and traceability in ESG reporting. Blockchain can provide a secure and immutable ESG data record, ensuring stakeholders can trust the information.
- Data Analytics: Leverage data analytics tools to analyse ESG data and generate actionable insights. These tools can help organisations identify risks and opportunities, supporting informed decision-making and strategic planning.

Concluding Remarks

The journey towards compliance with the EU AI Act and CSRD highlights the complexities and challenges of aligning high-risk AI systems with stringent ESG regulations. Regulated entities like Test Bank planning for this journey might need to seriously consider extending mandatory ESG obligations to a broader range of AI systems, not just those classified as high-risk under the AI Act, to create a unified and streamlined compliance module in their regulatory compliance journey. This would ensure a consistent application of ESG principles across all AI operations and support the EU's broader sustainability goals.

Furthermore, the ethical dimension of AI governance, particularly its social impact, should not be overlooked. The AI Act attempts to mitigate adverse impacts on society by promoting fairness and accountability in AI applications. However, broader societal concerns exist, such as the potential for a more significant digital divide, skills mismatch with creating high-tech jobs that remain vacant for years, and job displacement in specific sectors. Addressing these concerns requires a holistic approach to AI governance, including robust social impact assessments and proactive measures to support workforce transition and digital inclusion.

In conclusion, while the AI Act and associated ESG regulations represent significant steps towards integrating sustainability into AI governance, their current form presents challenges that need addressing. The reduction in mandatory ESG obligations for non-high-risk AI systems could weaken the overall impact of these regulations. As the AI landscape evolves, policymakers and stakeholders must revisit and refine these regulations to ensure they effectively promote sustainable and ethical AI practices.

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