



Nordic
Innovation

Nordic Ethical AI Expert Group

- Policy Recommendations
for Ethical and Responsible AI

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Disclaimer

This document has been authored by the Nordic Ethical AI Expert Group, established in September 2023 by Nordic Innovation, the innovation organisation under the Nordic Council of Ministers.

The Expert Group is part of the [Nordic Ethical AI & Data Ecosystem Building](#) project, initiated by Nordic Innovation in collaboration with Accenture and Silo AI, and is a component of Nordic Innovation's AI and Data program. The overarching goal of this initiative is to help outline the roadmap to reach the vision of the Nordic region as a leader in ethical artificial intelligence (AI) and responsible data use by 2030¹, contributing to sustainable growth and innovation throughout the Nordic countries.

It is important to acknowledge that the views and recommendations expressed in this document are those of the Nordic Ethical AI Expert Group, which consists of 23 members selected through an open call from May to August 2023. These members represent a diverse cross-section of Nordic industry leaders and AI experts from various business sectors and academia. While there is a strong collective commitment to enhancing Nordic cooperation and advancing the ethical AI ecosystem, it is crucial to note that not all members may concur with every statement or recommendation presented herein.

The recommendations put forward in this document reflect a concerted effort to distill the insights of the Nordic business community and to outline policy actions that support the vision of making the Nordics a frontrunner in digitalization, ethical AI, and responsible data usage. However, the recommendations should not be interpreted as unanimous consensus among all members of the Expert Group.

¹ In 2019, the Nordic Prime Ministers agreed on a new vision for the Nordic cooperation, Vision2030, which holds that the Nordics is to be the most sustainable and integrated region in the world by 2030. Following this, the five Trade and Industry Ministers launched eight programmes for the period 2021-2024, whereof AI & Data is one with the vision for the Nordics to become a leading region in digitisation, ethical AI and responsible use of data by 2030.

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Objective and Scope

The recommendations presented in this document reflect the opinions of members of the Nordic Ethical AI Expert Group, and it is directed towards policymakers across the Nordic countries. The Nordic Ethical AI Expert Group was created in September 2023, and consists of 23 members. The recommendations are based on discussions between the experts over three consecutive meetings that took place in September 2023, November 2023, and January 2024. Indirectly, the recommendations also reflect individual written responses by expert group members, as there were individual assignments leading up to each meeting, as well as written commentary on earlier drafts of this document.

The expert group was created as part of the Nordic Ethical AI and Data Ecosystem project in the AI and Data program managed by Nordic Innovation. Accenture and Silo AI were appointed project managers through public tender and facilitated the work of the expert group alongside with the other workstreams included in the project. The project team from Accenture and Silo AI was responsible for drafting this document based on documentation of discussions and conclusions from each expert group meeting. All members of the expert group have had the opportunity to review and comment on this document.

Expert Group Meetings

The expert group met on three occasions to discuss and develop recommendations for how the Nordic region should act together to become leading in ethical AI globally.

Meetings

- Kick-Off and working session 1 – Setting the scope
– key opportunities for ethical AI, 27th September 2023
- Working session 2 – Overcoming challenges and reaching target state, 22nd November 2023
- Working session 3 – Final recommendations,
23rd January 2024

Expert Group Members

The AI expert group consists of members with expertise in the development and deployment of ethical AI and with a background from enterprises, academics, public sector and civil society. Expert group members were selected after a call for interest, open between May-August 2023. Nordic Innovation was responsible for the selection of the members of the expert group.

Members

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- Alexander Galt, Digital Ethics Leader, Inter IKEA Group

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- Erik Josefsson, CEO, R-evolution (the sustainable innovation and green-tech investment subsidiary of Hexagon AB)
- Peter Jørgensen, Managing Director, Nordic Data & AI Practice Lead, Accenture
- Sonal Makhija, Responsible AI and Data Specialist, H&M Group
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Executive Summary

Urgent call for Nordic collaboration on ethical AI and data management

The rapid advancement of artificial intelligence (AI) technologies presents both unprecedented opportunities and significant challenges. The Nordic countries—renowned for their high levels of digitalization and strong societal values—face a critical moment. The recent declaration by the Nordic Prime Ministers in Oslo on October 31, 2023, underscores a shared commitment to digital resilience and the responsible use of AI. This sets the stage for transformative actions that can not only guide the Nordics but also serve as a model globally.

The need for a unified strategy

Despite individual efforts by Denmark, Finland, Norway, and Sweden to develop national AI strategies that emphasize ethical and trust-based AI, a unified Nordic approach is lacking. This fragmentation misses opportunities for leveraging regional strengths and addressing common challenges effectively.

A cohesive Nordic strategy would consolidate resources, expertise, and innovative capabilities to develop robust, ethically sound AI solutions. This strategy is vital for aligning with EU regulations and setting a global benchmark in ethical AI.

Five recommended actions

The Nordic Ethical AI Expert Group, established as an initiative by Nordic Innovation, the innovation organization under Nordic Council of Ministers, recommends five strategic actions to overcome main barriers and harness AI's potential responsibly in the Nordics:

1

Develop a joint Nordic strategy for ethical and responsible AI:

Streamline efforts across borders, enhancing synergy and establishing the Nordics as leaders in ethical AI.

2

Establish a Nordic centre for ethical and responsible AI:

Create a hub for ethical AI innovation, supporting Nordic businesses in developing and adopting AI responsibly and enhancing the region's global leadership in ethical and responsible AI.

3

Promote and coordinate large language models (LLMs)s for Nordic languages:

Develop LLMs that reflect the unique linguistic and cultural diversity of the Nordics, ensuring digital sovereignty and alignment with democratic values.

4

Cultivate a skilled workforce and competent society:

Integrate human rights, ethics, and sustainability into education and workforce development, preparing society for the ethical use of AI.

5

Enhance transparency in sustainability of AI technology:

Develop a standardized framework to assess and report the environmental impact of AI technologies, reinforcing the Nordics' commitment to sustainable development.

Immediate steps for implementation

To initiate these actions, we propose the following immediate steps:

- Form a multidisciplinary expert committee to draft the joint Nordic strategy.
- Secure funding and establish operational frameworks for the Nordic Centre for Ethical and Responsible AI.
- Initiate dialogues and set up structures for the coordination and development of foundation models for Nordic languages.
- Engage with universities and other educational institutions to integrate ethics into AI-related curricula.
- Convene stakeholders to develop the AI sustainability assessment framework.

The Nordic Ethical AI Expert Group's proposals aims to integrate ethical AI principles into business operations, education systems, and governmental policies, thereby equipping the Nordic society and workforce for a future deeply intertwined with AI.

This approach seeks not only to mitigate the risks associated with AI technologies but also to leverage their potential for driving sustainable development. As the Nordic nations begin to implement these guiding principles, their concerted efforts are poised to serve as a global exemplar of responsible AI governance.

To coordinate, collaborate, or inquire regarding the recommendations you are welcome to contact Nordic Innovation at olivia.rekman@nordicinnovation.org and ville.makinen@nordicinnovation.org.

Introduction

"Artificial intelligence (AI) presents great opportunities for society, but also serious challenges to our democracy. The Nordic countries, with their advanced level of digitalization, similar societal structures and shared values, are well-positioned to jointly counter such challenges."

– The Nordic Digital Resilience declaration, signed by the five Nordic Prime Ministers in October Oslo 2023



The Nordic Ethical AI Expert Group was established to propose concrete actions that can help to propel the Nordic vision of becoming world leading in ethical AI² and responsible use of data.

The goal of the recommendations is to support **Nordic businesses** with increasing adoption of ethical AI and responsible use of data. The expert group's efforts align with the Nordic Prime Ministers' declaration for a collaborative approach to bolster democracy against disruptive AI technologies such as generative AI, which, while promising, also pose risks such as the spread of disinformation and threats to human rights.

AI will have a transformative effect on individual's lives, all sectors in business, as well as society at large. On 31st of October 2023, the Nordic Prime Ministers signed a joint declaration about *Nordic Digital Resilience*³ pointing to a need for a Nordic collaborative effort to strengthen our democracies, in the light of new technological developments in AI. Generative AI has brought public awareness towards this ongoing technology shift that brings immense opportunities but also great risks. In the spring of 2023, more than 1000 global technology leaders and researchers signed a call for a six-month global moratorium on development of advanced AI, warning that AI tools could present "profound risks to society and humanity"⁴. Businesses across the Nordics recognize this too. 68% of surveyed leaders from businesses in Denmark, Finland, Sweden, and Norway in 2023 stated that the availability and development of generative AI has increased their interest in ethical and responsible AI⁵.

At the same time, AI holds immense potential for society at large. On an aggregated level, it's a technology that can help us generate new

² The work of the expert group refers to the **OECD's definition of AI**, which has also informed the EU AI Act proposal: "An AI system is a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments. Different AI systems vary in their levels of autonomy and adaptiveness after deployment". The group also refers to the **European Commission's High-Level Expert Group in AI** (HLEG AI) and their Ethics Guidelines for Trustworthy Artificial Intelligence (2019) as the basis for their conception of ethical and responsible AI. According to these Guidelines, **the seven key requirements of trustworthy AI are:** 1. Human agency and oversight; 2. Technical robustness and safety; 3. Privacy and data governance; 4. Transparency; 5. Diversity, non-discrimination and fairness; 6. Societal and environmental wellbeing, and; 7. Accountability.

³ Under the chairmanship held by Iceland in Nordic Council of Ministers during 2023, the Nordic digital resilience declaration was signed in Oslo 31st October 2023 by the five Nordic Prime Ministers: <https://www.government.is/library/01-Ministries/Prime-Ministrers-Office/Nordic%20digital%20resilience%20FINAL.pdf>

⁴ Future of Life, April 2023, Policymaking in the Pause. What can policymakers do now to combat risks from advanced AI systems?

⁵ Accenture, Re:humanize Institute, Impact leadership in the age of Generative AI, 2024

ideas and innovations targeting today's and future societal challenges. Further, there are indicators pointing to the technology's potential impact and driver for economic growth through productivity gains. For example, AI systems can help to meet increasing demands on the welfare state such as in healthcare, due to changing demographics in the Nordics. AI can also accelerate the green transition by generating new ideas and optimizing resource usage across various sectors. At the same time, it will be crucial to hedge against the technology's own high energy consumption and the use of critical minerals in hardware needed. Ethical AI and responsible use of data has been identified as a potential competitive advantage for Nordic businesses⁶.

Together, the five Nordic countries list as the 12th largest economy globally⁷ and have around 27 million inhabitants. In the Nordic region, the commitment to fairness, equality, trust, and respect for human rights is in the foundation of shared values. These values are crucial for guiding the responsible development of ethical AI. With our dense concentration of tech companies relative to population size, we punch above our weight and are well-positioned to lead in ethical AI development. But to do so, we must support Nordic businesses in their journey to adopt ethical AI by creating favorable institutional conditions. By doing so, we can be a creator and early adopter of technology – shaping the agenda rather than passively consuming tech and innovation created elsewhere, making us more dependent and potentially vulnerable. Such leadership does not only ensure our regional values but also provides us with a significant competitive edge, affirming the principle that ethical business is good business. Adopting an ethical and responsible approach to AI has potential to bring many business benefits, including for example faster adoption of new technology and support with regulatory compliance⁸.

Moreover, the spirit of collaboration among the Nordic countries amplifies our influence, enabling us to champion responsible AI practices on a larger stage. By uniting around the concept of ethical AI, we set a precedent that extends far beyond our own borders, reinforcing the Nordic region's role as a beacon of innovation and integrity in technology.

⁶Nordic AI & Data Ecosystem, Nordic Innovation, 2022

⁷IMF World Economic Outlook April 2021

⁸Nordic Innovation, The Benefits of Ethical and Responsible AI, 2024

The policy landscape for AI is developing rapidly and regulators are proposing different ways of steering the development and use of AI⁹. Many take a risk-based approach, with a context-specific use-case in focus. Additionally, regulatory strategies are evolving for general-purpose AI models¹⁰. At an EU level, the EU AI Act was voted on in March 2024 and is viewed to become the world's first comprehensive AI regulation. The AI Act places harmonized rules for AI systems put on the EU-market, to protect the safety, health, and fundamental rights of individuals¹¹. The European AI Office has been established to support the implementation of the AI Act by ensuring consistent application across Member States, developing tools for evaluating AI models, collaborating with experts to establish codes of practice, investigating rule infringements, and providing guidance for effective implementation and compliance monitoring¹². The Committee on Artificial Intelligence of the Council of Europe also approved the draft Framework Convention on Artificial Intelligence and Human Rights, Democracy and the Rule of Law in March 2024, a legally binding instrument on the development, design and application of AI systems¹³.

Governments are also creating supporting infrastructure in parallel with introducing regulatory frameworks. For example, several national institutes have been created by leading AI nations to contribute to ethical AI nationally and globally, for example in the US¹⁴, UK¹⁵ and Japan¹⁶. These

⁹ For example: [UK Government, Pro-Innovation Approach to AI Regulation, 2023](#) & [UK Government, Implementing the UK's AI Regulatory Principles, 2024](#); Government of Canada, Artificial Intelligence and Data Act, 2023; Government of Brazil, Senado Federal, Bill No. 2338 of 2023, US [White House, Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence, 2023](#) & US [White House, Biden-Harris Administration Announces Key AI Actions 180 Days Following President Biden's Landmark Executive Order, 2024](#); Greater China, [Internet Information Service Algorithm Recommendation Management Regulations, 2021 \(machine translated\)](#) & [Greater China, Regulations on the Safety Management of Facial Recognition Technology Application \(Trial Implementation\) \(Draft for Comment\) 2023 \(machine translated\)](#)

¹⁰ For example: PwC, Tiang & Partners, China's Interim Measures for the Management of Generative Artificial Intelligence Services officially implemented, 2023; Government of Canada, Voluntary Code of Conduct on the Responsible Development and Management of Advanced Generative AI Systems, 2023; US AI Foundation Model Transparency Act, 2023

¹¹ European Parliament, Artificial Intelligence Act: deal on comprehensive rules for trustworthy AI, 2023

¹² [European Commission, The European AI Office, 2024](#)

¹³ Council of Europe, Committee on Artificial Intelligence, Draft Framework Convention on Artificial Intelligence and Human Rights, Democracy and the Rule of Law

¹⁴ U.S. Department of Commerce, At the Direction of President Biden, Department of Commerce to Establish U.S. Artificial Intelligence Safety Institute to Lead Efforts on AI Safety, November 2023

¹⁵ UK Gov, Department for Science, Innovation & Technology, Introducing the AI Safety Institute, November 2023

¹⁶ Japanese Ministry of Economy, Trade and Industry, Launch of AI Safety Institute, 2024

are typically tasked by the government to research the potential risks of AI, evaluate advanced AI systems, and facilitate information exchange. There is also international collaboration between governments on defining standards for global AI governance and risk management, through for example the G7¹⁷, G20¹⁸, EU-US Trade and Technology Council¹⁹ and the World Economic Forum AI Governance Alliance²⁰. Additionally, non-governmental organizations play a vital role in shaping global AI standards and practices. For instance, the OECD tracks AI developments²¹, and provides definitions, principles and frameworks to help governments integrate responsible AI practices²². UNESCO published the first global standard on the ethics of AI in 2021²³, and launched an advisory board in 2023 that will among all provide recommendations on the governance of AI²⁴. Across the five Nordic countries, national AI advisory boards, AI committees, AI working groups and AI commissions have been established to support policymakers in how to advance each respective country in becoming leading in AI. Many of the national members of these groups which also sit in EU and OECD advisory expert groups, are represented in the Nordic Ethical AI Expert Group. This enables synergy from national to Nordic level as well as EU and international level.

From various stakeholder interviews, survey data and in the work done by the expert group, **five topics have been identified including main barriers and key challenges for business in the Nordic region** to achieve the ambition of the Nordics as leaders in digitalization, ethical AI, and responsible data use:

- Implementation of regulation on AI and ethical AI standards and practices
- Data management within the whole data value chain
- Talent and skills
- Pilot to production - bridging the gap between academia and industry as well as scaling AI
- AI and sustainability

¹⁷ European Commission, G7 Leaders' Statement on the Hiroshima AI Process, 2023

¹⁸ India's G20 Presidency, G20 New Delhi Leaders' Declaration, 2023

¹⁹ European Commission, EU-US TTC Joint Roadmap for Trustworthy AI and Risk Management, 2022

²⁰ WEF, AI Governance Alliance, 2023; WEF, World Economic Forum Launches AI Governance Alliance Focused on Responsible Generative AI, 2023

²¹ OECD.AI, The OECD Artificial Intelligence Policy Observatory

²² OECD.AI, Artificial Intelligence

²³ UNESCO, Ethics of Artificial Intelligence, 2024

²⁴ UN, AI Advisory Body, 2024

This document recommends five concrete actions targeting the five main barriers for Nordic businesses in reaching the vision of the Nordics as leading region in ethical AI and responsible use of data.

These five policy recommendations are:

1. The creation of a joint Nordic strategy for ethical and responsible AI and data management
2. The founding and funding of a Nordic Centre for Responsible AI pooling and coordinating resources to support Nordic businesses application of ethical AI
3. Coordination of development of large language models for Nordic languages for strategic autonomy in data infrastructure and protecting Nordic democracy
4. Developing a skilled workforce and a competent society in ethical and responsible AI
5. Develop framework for transparency around the sustainability of AI technologies

To coordinate, collaborate, or inquire regarding the recommendations you are welcome to contact Nordic Innovation at olivia.rekman@nordicinnovation.org and ville.makinen@nordicinnovation.org.

Policy Recommendations

1. Recommendation:

*A Nordic Strategy
for Ethical and
Responsible AI*

This recommendation advocates for the development of a joint Nordic strategy for ethical and responsible AI. While Denmark, Finland, Norway, Iceland and Sweden each have their own national AI strategies emphasizing ethical and trust-based AI, the absence of a unified Nordic approach leads to missed opportunities for regional synergy and collaboration²⁵. These individual efforts highlight the region's potential to lead globally in ethical AI, which offers a competitive edge. However, a cohesive Nordic strategy could significantly enhance this potential by allowing the Nordic countries to pool their resources, expertise, and innovative capabilities. This unified approach would foster the development of robust, ethically sound AI solutions that reflect shared values and societal contexts.

Moreover, innovators often encounter challenges in aligning their unique solutions with existing laws and policies. Here, regulatory sandboxes offer a strategic solution. These temporary setups facilitate the testing of new innovations in a controlled, real-world environment under the guidance of regulatory authorities. Despite their limited adoption, regulatory sandboxes have shown significant benefits across multiple sectors and nations. The EU AI Act, for instance, mandates that Member States establish at least one AI regulatory sandbox within 24 months of its enactment²⁶, encouraging possibilities for joint establishment. A joint Nordic AI Regulatory Sandbox, as outlined in recommendation two, could serve as a crucial initiative, aligning with the unified strategy and amplifying the region's capabilities in ethical AI. This sandbox would not only comply with the EU requirements but also pioneer a model for responsible innovation in the Nordic region.

A Nordic Ethical and Responsible AI strategy would serve as a comprehensive framework to guide the ethical development, deployment, and use of AI technologies, ensuring alignment with the region's commitment to social welfare, human rights, and sustainable development. As the EU AI Act sets a foundational risk-based regulatory framework, the Nordics are uniquely positioned to tailor its adoption to its strengths and build a competitive advantage of being a frontrunner in the adoption of ethical AI in Nordic businesses. This strategy would not only adhere to EU regulations but also set a benchmark for global standards, reflecting the rapid advancements in AI and the Nordic commitment to innovation and public trust.

²⁵ Government of Denmark, the Danish National Strategy for Artificial Intelligence, 2019; Government of Finland, Finland's Age of Artificial Intelligence, 2017 & Government of Finland, Artificial Intelligence 4.0 Programme; Government of Norway, the National Strategy for Artificial Intelligence, 2020; Government of Iceland, National AI Policy, 2021; Government of Sweden, National Approach to AI, 2018

²⁶ European Parliament, Texts Adopted – Artificial Intelligence Act, March 2024

This joint strategy would consolidate Nordic efforts, share best practices, and leverage collective expertise to foster ethical AI globally. By adopting this strategy, the Nordics could influence international standards and enhance their bargaining power in international forums, addressing broader societal challenges like climate change and demographic shifts.

The Nordic Strategy for Ethical and Responsible AI could significantly enhance several key areas by integrating high ethical standards into the development and application of artificial intelligence. In data management, it promotes trust and transparency, advocating for transparent algorithms and ensuring ethical handling of data with strict privacy protections. Regarding talent and skills, the strategy supports the creation of specialized educational programs that emphasize both the technical and ethical dimensions of AI, fostering a workforce skilled in interdisciplinary approaches.

For the implementation of ethical AI principles, the strategy would encourage the adoption of a common ethical framework that includes principles such as fairness and accountability, alongside regular ethical audits of AI systems. In terms of sustainability, it emphasizes the development of eco-friendly AI technologies and supports integrating AI to enhance efficiencies in sectors like energy and manufacturing, thus contributing to environmental sustainability.

Additionally, the strategy aims to bridge the gap from research to industry by promoting collaborations between academia and industry and supporting startups and SMEs through funding and access to technology. This holistic approach not only advances technological innovation but also ensures it aligns with societal values and norms, positioning Nordic countries as leaders in the ethical AI domain.

Importance for the Nordics:

- The Nordic countries are known for their high standards in social welfare, human rights, and environmental sustainability. A strategy focused on ethical and responsible AI development aligns entirely with these values, ensuring that technological advancements contribute positively to society without compromising ethical principles.

- By adopting a unified strategy and implementing on this, the Nordics can position themselves as global leaders in the field of ethical AI. This leadership role can influence international standards and practices, promoting a human-centric approach to AI globally²⁷. A shared Nordic voice enables bargaining power in the EU/EUS and other international fora.
- A joint strategy encourages closer collaboration among Nordic countries, fostering innovation and faster adoption of AI while ensuring that it is guided by a common set of ethical principles and practices. By pooling resources and leveraging each country's strengths and special strongholds in the field of AI²⁸, the Nordic region can obtain the critical mass needed to stay competitive globally. In addition, a Nordic strategy can be leveraged to jointly address societal challenges such as climate change, security and strategic autonomy in supply and value chains and demographic changes and its impact on the welfare state.

Suggested steps for implementation:

- **Formation of a Multidisciplinary Expert Committee:**
Assemble a committee comprising of professionals from academia, industry, government, and civil society to develop the strategy. This committee should represent a broad range of expertise and perspectives to ensure the strategy is comprehensive and inclusive.
- **Extensive Stakeholder Consultations:**
Conduct consultations with a wide array of stakeholders, including citizens, industry representatives, advocacy groups, and international organizations. The needs and competences of communities and groups vulnerable to adverse AI impacts, such as minority groups, children, elderly, people with disabilities, should

²⁷ "The Nordic Region can help to set the global agenda and promote core values such as trust, security, and user adaptation in digital development" The Nordic Region – *towards being the most sustainable and integrated region in the world: Action Plan for 2021 to 2024*, Nordic Council of Ministers, 2020

²⁸ An extensive mapping of strongholds and challenges related to AI and data of each of the Nordic countries as well as jointly for the Nordic as a whole was done in Q2 2022, see Nordic AI & Data Ecosystem, Nordic Innovation (2022).

be consulted. These consultations are crucial for understanding diverse perspectives on AI ethics and ensuring the strategy addresses a wide range of concerns and aspirations.

- **Development of the Strategy Document and Action Plan:**
Create a detailed strategy document outlining goals, principles, guidelines, and mechanisms for ethical and responsible AI in the Nordics. There is an existing vision for the Nordics to be leading in digitalization, ethical AI and responsible use of data by 2030²⁹. Accompany this document with an actionable plan that specifies concrete steps, timelines, and responsibilities to achieve the outlined goals.
- **Establishment of the Nordic Centre for Responsible AI (see recommendation 2):**
Found and fund a dedicated centre to oversee the implementation of the strategy and action plan. This centre would also serve as a hub for collaboration, research, and dialogue on ethical AI within the region and for international outreach and participation in international AI governance initiatives.
- **Collaboration and Alignment with International Efforts:**
Engage in collaboration with other countries and international bodies to share best practices, align standards, and contribute to global discussions on ethical AI. This engagement will enhance the strategy's credibility and impact on the international stage.

²⁹ The joint vision adopted by the five Nordic Prime Ministers in 2019 is for the Nordic region to become the most sustainable and integrated region in the world in 2030. From this followed action plans and eight programmes coming from the Nordic Ministers of Trade, Business and Industry whereof AI & Data programme is one. [Our Vision 2030 | Nordic cooperation \(norden.org\)](https://norden.org/OurVision2030/)

Impact and Efficiency:

- **Societal and Economic Impact:**

These initiatives are designed to ensure AI benefits society at large, supports innovation, and fosters ethical AI adoption at scale. By aligning incentives and focusing on practical applications, the Nordics can enhance both societal welfare and economic competitiveness.

- **Cost and Time Efficiency:**

Centralizing efforts on a Nordic level ensures resource optimization, enabling more efficient development of ethical AI practices and infrastructure. Starting with a scalable approach allows for gradual expansion based on needs and successes.



2. Recommendation:

*A Nordic Centre for
Responsible AI*

Establishing and operating the Nordic Centre for Ethical and Responsible AI will be a vital component of the proposed Nordic Ethical and Responsible AI strategy.

This centre will serve as a platform for experts, researchers, industry professionals, and policy-makers engaged in ethical and responsible AI, primarily facilitating knowledge translation and business adoption-focused initiatives. Unlike the current landscape, which lacks a unified hub for knowledge exchange and best practices, this centre will focus on assisting Nordic businesses in integrating ethical AI practices through practical, application-driven programs rather than fundamental research. The centre will foster responsible AI innovation by leveraging existing infrastructure and ecosystem actors across the Nordic countries. It will coordinate and network with national AI initiatives, pool resources for projects like LLMs in healthcare, and promote vocational training and competence development outside traditional academic settings. This approach ensures the centre enhances practical AI applications and business adoption, utilizing in-house functions within existing institutions to maximize resource efficiency and cross-border collaboration.

By advancing the understanding and implementation of ethical AI practices, the centre will ensure that AI development aligns with human-centric values, democratic principles, and environmental sustainability. It will operate with a dynamic governance structure that promotes a rotating influx of diverse expertise from various domains. This governance will support a vibrant, knowledge-rich environment, ensuring the centre's activities remain at the forefront of ethical and responsible AI. The centre will also have access to extensive compute and data resources, facilitating cutting-edge research and innovation in the technical dimensions of ethical and sustainable AI design.

During its initial phase, the centre could function as a virtual organization, focusing on building collaborations at existing key actors in the Nordic AI ecosystem and defining governance structures without the immediate establishment of new physical entities. This phase will also explore securing extensive compute and data resources needed for cutting-edge innovation in ethical AI applications, as well as finding the right scope for the centre. Funding and resources could be secured from both public and private sectors, with an initial phase of utilizing existing key ecosystem actors to establish national hubs.



The Nordic Centre for Ethical and Responsible AI aims to fill the critical void of a coordinated Nordic effort among stakeholders collaboratively tackling AI's ethical, societal, and technological challenges. This absence currently hinders efficient exchange of knowledge and best practices.

By establishing a Nordic Centre for Ethical and Responsible AI, the Nordics will further strengthen its position as a global leader in sustainable technology innovation and research. Selected initiatives currently undertaken by all Nordic countries independently could instead be coordinated by the centre to achieve scale and optimize resource allocation. One example is the EU AI Act's requirements on Member States to establish at least one AI regulatory sandbox within 24 months of its entry into force, with possibilities for joint establishment³⁰. A joint Nordic AI Regulatory Sandbox could therefore serve as a pivotal initiative for the Nordic centre.

Importance for the Nordics

- The establishment of this centre aligns with the region's long-standing commitment to innovation, technology development and research as well as to welfare and sustainability. By becoming leading in ethical and responsible AI, the Nordic region could contribute to operationalizing its core values in the digital age as well.
- The Nordic Centre for Ethical and Responsible AI can enhance the region's competitiveness and attractiveness as a global hub for ethical AI research and innovation, attracting talent, investments, and collaborations worldwide.
- The centre can play a pivotal role in shaping global standards and practices for AI ethics, given the Nordics' reputation for transparency, sustainability, social welfare, democracy, and human rights.

³⁰ [European Parliament, Texts Adopted – Artificial Intelligence Act, March 2024](#)

Implementation Steps

- **Secure Funding and Resources:**
Engage with government bodies, private foundations, and academic institutions to secure the necessary funding and resources. This includes establishing national and international partnerships and exploring grants for initial and sustained operations.
- **Establish a Virtual Organisation:**
Initiate the centre as an independent virtual organization with key partner institutions and networks within the Nordic countries. This phase will focus on building collaborations, defining governance structures, and initiating projects.
- **Develop Infrastructure:**
Develop agreements on access to large-scale compute and data resources, including sensitive data collections, to support research and innovation efforts. This step involves both physical and virtual infrastructures to facilitate AI experiments and studies.
- **Implement a Rotating Governance Structure:**
Adopt a governance model that allows for a rotating influx of experts and practitioners from various fields. This ensures diversity in research and development efforts and facilitates knowledge exchange across institutions.
- **Expand to a Physical Centre:**
With the foundation defined and validated, expand the virtual organization into a physical Nordic Centre for Ethical and Responsible AI. This step will solidify the centre's presence and its role as a global leader in ethical AI.



Impact and efficiency

- **Societal and economic impact:**

Establishing the Nordic Centre for Ethical and Responsible AI will significantly enhance the region's ability to lead in ethical AI innovation. By serving as a central hub for experts and stakeholders, the centre will facilitate integration of ethical AI practices into Nordic businesses and industries. This will improve societal outcomes by ensuring that AI technologies are developed and deployed in alignment with human-centric values and democratic principles. Moreover, by promoting ethical AI, the centre can help avoid the pitfalls of AI misuse, thus safeguarding against economic and social disruptions.

- **Cost and time efficiency:**

The centre's approach of leveraging existing infrastructure and ecosystem actors across the Nordics for collaboration and resource pooling will maximize efficiency in both cost and time. Establishing a virtual organization initially allows for a low-cost, scalable start, focusing on building partnerships and governance structures without the immediate financial burden of establishing new physical facilities. This phased approach ensures that investments are gradual and aligned with emerging needs and successes, ultimately leading to more sustainable and impactful utilization of resources in promoting ethical AI practices.

3. Recommendation:

*Foundation models for
Nordic languages*

The Nordics should concentrate on strategically coordinating the development and implementation of general-purpose models, leveraging a Nordic corpus and values. The primary aim is to provide a trustworthy, local alternative models developed outside Europe, adhering to the EU's stringent standards. While these models are crucial for advancing research, science, innovation, and business growth within the region, the initial focus should be on coordinating existing efforts, rather than developing new models. This approach involves pooling funding and aligning efforts with existing initiatives, including those by private entities that are already developing models for both global and Nordic languages. The Nordic Centre for Ethical and Responsible AI in recommendation 2 is a natural coordinating part, and this initiative is suggested to fall under the responsibility of the centre.

There are already several initiatives focused on training large language models for the Nordic languages³¹. Efforts at a Nordic level should therefore not necessarily focus on competing with these initiatives, but instead emphasize strategic coordination between existing initiatives. This could include facilitating access to and sharing of language data essential for training and validating these models, which supports linguistic diversity and aligns AI technologies with Nordic democratic values and social norms. This focus on coordination would enhance digital sovereignty and ensure that technologies reflect the unique linguistic and cultural context of the Nordics, including support for less widely spoken languages like Sami.

Importance for the Nordics:

- The Nordics have a rich array of languages and dialects, which are not fully supported by current AI models. Building Nordic-centric large language models ensure better representation and support for these languages, enhancing accessibility and usability of downstream AI applications across the region.
- Nordic countries have high standards for privacy, security, trustworthiness, and public service values. Nordic general-purpose AI models would inherently address these concerns, offering secure and reliable AI solutions that align with local values and regulatory frameworks.

³¹ For example: [AI Sweden, GPT-SW3](#); [Government of Iceland, Head start for Icelandic, 2023](#); [Silo AI, SiloGen Launches a Consortium to build the World's Largest Open LLM, 2023](#)

- Such general-purpose AI models can drive innovation and economic growth by providing a platform for Nordic companies and researchers to build upon, encouraging local startups, and supporting research in fields like healthcare, education, and public services.

Implementation Steps:

The Nordic Centre for Ethical and Responsible AI and the development of a cohesive Nordic AI strategy mark significant steps towards fostering collaboration across the Nordic region, especially in the creation of large language models. Such models, designed to encapsulate the linguistic diversity and cultural nuances of the Nordics, underscore the need for an inclusive approach to AI that benefits all citizens. Recognizing the languages and cultural heritage within the Nordic countries is crucial for ensuring that AI technologies are accessible and advantageous for everyone. This endeavor aligns with the Nordic commitment to innovation, ethical standards, and social responsibility, highlighting the region's potential to lead globally in responsible and inclusive technology development.

- **Phase One: Establishing a Forum**

Fund and launch a forum for discussing collaboration on large language models in the Nordics. This forum would serve as a precursor to a more formal engagement, fostering early dialogue, alignment, and planning among stakeholders.

- **Phase Two: Setting Up Structures**

Develop structures in one or several Nordic countries to support the operational, research, and development aspects of large language models. This includes securing funding, establishing partnerships, and creating a legal and regulatory framework.

- **Phase Three: Operational Work and Ongoing Development**

Begin operational work on large language models, focusing on research and industry applications across the Nordic countries. This involves continuous development of the models, collaboration with the private sector for data access, and addressing specific regional needs like language diversity and AI alignment.

Impact and Efficiency:

- **Societal and Economic Impact:**

These models can significantly influence democracy, healthcare outcomes, and the inclusivity of AI technologies across different groups and regions within the Nordics. They address security concerns, such as misinformation campaigns, and ensure AI alignment with regional values.

- **Cost and Time Efficiency:**

Starting with a low-cost, low-time-investment forum maximizes resource efficiency, allowing for gradual escalation based on identified needs and successes. Early coordination on data and algorithms can mitigate future costs and harms, leading to a more responsible and beneficial application of AI in the Nordic context.



4. Recommendation:

*A skilled workforce and
a competent society*



This recommendation proposes a comprehensive approach to integrate human rights, data and AI ethics, and responsible and sustainable AI principles into university education, the workforce and wider society in the Nordic countries. More in detail, this recommendation suggests all AI-related university courses, from bachelor's to master's degrees, to include classes on human rights, ethics, and sustainability perspectives on AI. In addition, the Nordics should focus on developing and offering a master's program in AI ethics. In parallel to fostering specialized knowledge and skills on AI, the Nordics should work to increase the awareness among the Nordic citizens about AI's ethical impacts and potential risks, and what rights that enable citizens to seek redress. This is inspired by Finland's "Elements of AI" course which was launched as a free course to increase the public knowledge of and involvement in AI and is a meaningful example of a method to explore³².

Currently, there is a noticeable gap in the widespread understanding of potential ethical implications and risks with AI among both those involved in AI development and deployment, and the general population in the Nordics. There is also a lack of systematic incorporation of human rights, ethics, and sustainability perspectives in AI education in university curriculums.

By addressing these gaps, the Nordic region can foster a more informed society that can participate in, and request, responsible AI development and governance. Further, it would ensure that future AI talent is equipped with the skills and knowledge required to implement ethical and responsible AI standards and requirements in AI applications.

Importance for the Nordics:

- Incorporating human rights, ethics, and sustainability perspectives in AI education and awareness-building campaigns reinforces the Nordic commitment to democratic participation in technological advancements.
- A workforce well-versed in AI and potential ethical implications and risks is crucial for ensuring that AI is developed and used responsibly to benefit society.
- Educating citizens and involving unions in AI discussions helps proactively address concerns around job displacement, rights, and the ethical use of AI in workplaces, promoting a fair transition to increasingly digital economies.

³² Elements of AI, A Free Online Introduction to Artificial Intelligence for Non-Experts

Implementation Steps:

- **University Curriculum Integration:**

- Engage in discussions with Nordic universities to highlight the importance of including human rights, ethics and sustainability perspectives in computer science and data science-related courses.
- Collaboratively develop a standardized AI curriculum that incorporates human rights, ethics, and sustainability perspectives, which can be adapted across various disciplines (e.g. technology, business, law, social sciences, medicine, and humanities) to foster cross-disciplinary collaboration.
- Implement the curriculum across bachelor's and master's programs, ensuring all students in fields with AI relevance receive this essential education.

- **Inclusive Education on AI for Citizens and Unions:**

- Utilize and adapt existing courses to educate the broader public on AI, its implications, and ethical considerations. (Adopting Models like Elements of AI³³)
- Facilitate discussions and educational programs in collaboration with labour unions to explore the impact of AI on the workforce and workplace rights.
- Facilitate discussions and educational programs in collaboration with civil society organizations to explore the impact of AI on different community groups and citizen rights.
- Encourage the use of democratic participatory methods in the design and development of AI systems, ensuring a broad range of voices are heard and considered.

³³ Ibid.

Impact and Efficiency:

- **Societal and Economic Impact:**
Implementing these recommendations can lead to a significant shift in societal understanding of AI, from the risks of misinformation to the ethical considerations in AI deployment.
- **Cost and Time Efficiency:**
Leveraging existing educational models and integrating data and AI ethics into existing university programs offer a cost-effective and timely approach to building AI competency across society.



5. Recommendation:

*A Transparency around
the Sustainability of AI
Technologies*

This recommendation advocates for the development and adoption of a standardized framework for assessing the environmental and social impact of AI technologies. It identifies a significant gap in the current methodology for evaluating and communicating the sustainability of AI systems and proposes a comprehensive approach to address this. By incorporating this framework into public procurements and corporate sustainability reporting, the initiative seeks to ensure that the ecological and social footprint of AI technologies is thoroughly evaluated and managed. The recommendation underscores the importance of a multidisciplinary effort involving environmental and social scientists, AI experts, policymakers, and industry stakeholders to create a lifecycle assessment of AI systems. This includes considering aspects from data collection and curation to development, training, deployment, and eventual decommissioning.

The primary gap this recommendation aims to fill is the current lack of standardized methods for assessing and reporting the sustainability impact of AI technologies. This gap hinders the ability of organizations, both public and private, to make informed decisions regarding the sustainability of their AI deployments.

Implementing a standardized sustainability assessment framework offers the opportunity to lead in the responsible deployment of AI technologies, prioritizing solutions that are environmentally and socially sustainable. This AI-specific framework should be aligned with leading standards on the topic of sustainability impact assessment and reporting. This approach not only supports Agenda 2030 and the global sustainability goals³⁴, but also encourages innovation in for example green AI technologies, potentially setting new industry standards.

Importance for the Nordics

- The Nordics' well-established commitment to sustainability, environmental responsibility, and green technology innovation makes this recommendation particularly relevant.
- By integrating transparency around the sustainability of AI technologies, the Nordic region can strengthen its leadership in balancing technological advancements with environmental and social stewardship.

³⁴ United Nations, Transforming our World: The 2030 Agenda for Sustainable Development

- This initiative aligns perfectly with the Nordics' values, and enhances its position as a global leader in, and commitment to, responsible innovation.

Implementation Steps

- **Convene a multidisciplinary team:**
Assemble a group comprising of environmental and social scientists, AI experts, policymakers, and industry representatives to develop the sustainability assessment framework for AI.
- **Develop the sustainability assessment framework:**
Create a comprehensive framework that evaluates the entire lifecycle of AI systems. This framework should be robust, standardized, and adaptable to different types of AI technologies.
- **Assess integration with public procurement and corporate reporting:**
Perform an assessment of how to integrate the developed assessment framework with key processes such as public procurement of AI systems, and corporate reporting. Including alignment with existing and upcoming procurement and reporting requirements, e.g EU sustainability reporting.
- **Integrate into public procurement and corporate reporting:**
Amend public procurement policies to require the use of the sustainability assessment framework for AI technology purchases. Similarly, encourage corporate governance bodies to integrate this framework into their sustainability reporting practices.
- **Promote market incentives for green AI technologies:**
By prioritizing environmentally responsible AI solutions in public procurement and corporate reporting, create market incentives for the development and adoption of green technologies.
- **Public awareness and education:**
Raise awareness among stakeholders, including the general public, about the importance of sustainability in AI technologies. Educate on the benefits and necessity of choosing environmentally and socially responsible AI solutions.

Impact and efficiency:

- **Societal and economic impact:**
Implementing a framework for transparency around the sustainability of AI technologies can create a profound shift in societal understanding of AI. It raises awareness of the environmental and social impacts and sustainability practices associated with AI technologies, thereby influencing ethical considerations in AI deployment and usage.
- **Cost and time efficiency:**
Adopting a standardized framework for assessing the sustainability of AI systems offers a cost-effective and efficient approach to ensuring that AI technologies meet environmental and social standards. This approach can leverage existing sustainability assessment tools and integrate them into regulatory and corporate practices, streamlining the process and reducing the time needed for compliance and reporting.





Conclusion

In conclusion, the comprehensive suite of recommendations proposed by the Nordic Ethical AI Expert Group outlines a visionary path for the Nordic countries to establish themselves as global leaders in the ethical, responsible, and sustainable use of AI. These recommendations, ranging from the development of a unified Nordic strategy for ethical and responsible AI to the creation of large language models for Nordic languages, emphasize the region's commitment to leveraging AI for societal and environmental benefit while upholding high human rights and democratic standards.

The group's call for a multidisciplinary approach to AI governance — involving collaboration between governments, industry, academia, and civil society — underscores the complexity and interconnectedness of the challenges at hand. It also highlights the Nordics' unique position to address these challenges, thanks to their strong traditions of social welfare, human rights, and environmental stewardship. By fostering an ecosystem of knowledge and innovation, the Nordics can ensure that AI technologies developed and deployed within the region are not only technologically advanced but also ethically sound and aligned with the collective welfare of a global inclusive society.

Moreover, the recommendations recognize the critical role of AI in driving economic growth and competitiveness in the digital era. They propose practical steps to integrate ethical AI principles into business practices, education, and governance, thus preparing the Nordic workforce and society at large for a future in which AI plays a central role. This forward-looking approach not only aims to mitigate the potential risks associated with AI but also seeks to harness its transformative potential for sustainable development.

As the Nordic countries move to implement these recommendations, their efforts will serve as a model for ethical and responsible AI governance worldwide. By prioritizing ethical considerations, sustainability, and inclusivity in the development and deployment of AI, the Nordics can set a global standard for how technology should be harnessed to advance human dignity, protect the environment, and promote the public good. This vision for a future where AI serves as a force for good is not only ambitious but also within reach, thanks to the collaborative and principled approach championed by the Nordic Ethical AI Expert Group.

Background to the Nordic Ethical AI Expert Group Initiative

The work of the expert group references the OECD's definition of AI³⁵. The group further draws on the European Commission's High-Level Expert Group on AI (HLEG AI) and their Ethics Guidelines for Trustworthy Artificial Intelligence as foundational for their understanding of ethical and responsible AI³⁶. Additionally, several members of this expert group also serve on national advisory boards and the OECD, highlighting the interconnected nature of global AI governance initiatives. The seven requirements of the Ethics Guidelines are:

1. Human agency and oversight
2. Technical robustness and safety
3. Privacy and data governance
4. Transparency
5. Diversity, non-discrimination and fairness
6. Societal and environmental wellbeing
7. Accountability

Following the initial working session of the expert group, combined with insights from external data sources and ongoing discussions within the Nordics, five central themes were identified for the expert group to direct their recommendations towards.

- Implementation of regulation on AI and ethical AI standards and practices
- Data management within the whole data value chain Talent and skills
- Pilot to production - bridging the gap between academia and industry as well as scaling AI
- AI and sustainability

³⁵ OECD, Updates to the OECD's definition of an AI system explained, 2023

³⁶ European Commission High-level Expert Group on AI, Ethics Guidelines for Trustworthy AI, 2019

Implementation of AI principles and regulation

Nordic businesses face challenges in embedding ethical AI principles and preparing for AI regulations, necessitating a comprehensive understanding of the evolving regulatory and ethical landscape. A 2023 study found that 28% of business leaders in Denmark, Finland, Sweden, and Norway developed formal ethical AI guidelines, yet only 22% had operationalized these across their organizations, with 49% not developing any guidelines at all³⁷.

There is a critical shortage of industry-specific standards and guidelines to support the practical application of regulatory requirements and manage risks. Additionally, it is crucial for businesses to understand responsibilities within the AI value chain, particularly when involving third-party technologies, to effectively manage AI risks. Regional and national initiatives are essential in developing frameworks and standards aligned with international best practices, fostering industry collaboration, and enhancing skills and talent development. These efforts aim to clarify regulatory grey areas following EU AI Act enforcement and avoid fragmentation across the Nordic region.

The overarching goal is to ensure that ethical and responsible AI governance models are fully operationalized and integrated within businesses, aligning with both Nordic values and broader EU regulations. As new requirements emerge, these must be integrated into product development processes and connected to other regulatory areas such as privacy and data security, which pose significant challenges for businesses.

Data management

The Nordic State of AI Report from 2024 found that lack of shared practices related to data was one of the largest challenges related to scaling AI initiatives. Expert group members identified that key barriers to increasing responsible AI adoption in the Nordics are data quality, accessibility, and interoperability, as well as digital inclusion, representation, and creating a trusted Nordic data brand. The topic of data management covers the whole data value chain, which supports these improvements. There is a balance to be made between protecting

³⁷ Accenture, Re-humanize institute, Impact Leadership in the Age of Generative AI, 2024

sensitive data and enabling broad access to data, something that is crucial for training high-performing AI-models. There's a push for digitized, accessible data and incentives for its release to enhance data sharing among researchers and businesses. However, challenges in handling sensitive data responsibly, particularly in healthcare, highlight the need for clear ethical data management guidelines.

Talent and skills

The Nordic region's pursuit of ethical AI is closely tied to nurturing the right talent and skills, recognizing that the knowledge of ethical practices in AI needs to spread from a few experts to the broader workforce. It is important that employees have a good understanding and trust in the organization's approach to ensure ethical and responsible AI. When asked about the top three internal challenges to meeting future regulations of AI, Nordic organizations see a lack of talent and expertise as the primary one³⁹. Similarly, the 2024 edition of the Nordic State of AI Report found that lack of talent was the largest challenge related to scaling AI initiatives.⁴⁰ Additionally, ensuring ethical AI requires among all technical measures to measure and mitigate risks, for example regarding fairness or robustness. This typically requires specialist expertise. Recruiting, upskilling and retaining the right talent will therefore be key to enable organizations across the Nordics to adopt AI regulations, and operationalize ethical AI.

Pilot to production - bridging the gap between academia and industry as well as scaling AI

The Nordics boast world-class research in AI, including the sub-field of ethical AI. The expert group emphasized the importance of translating academic research more effectively into organizational practices, entrepreneurial activities, and value for Nordic businesses. Several of the novel technical methodologies for achieving ethical AI stem from research, and thus need to be transferred to industry actors in an effective way. Additionally, successfully realizing value from AI and ethical AI requires scaling AI initiatives and practices that helps ensure ethical and responsible outcomes. Organizations that exhibit high AI

³⁸ Silo AI, Nordic State of AI, Third Edition, 2024

³⁹ Accenture, From AI Compliance to Competitive Advantage, 2022

⁴⁰ Silo AI, Nordic State of AI, Third Edition, 2024

maturity have several things in common: their top leaders champion AI as a strategic priority for the entire organization; they invest heavily in talent to get more from their AI investments; they industrialize AI tools and teams to create a strong AI core; they design AI responsibly from the start; and they prioritize long- and short-term AI investments⁴¹. In 2022, only 6% of Nordic organizations had successfully realized value from their AI investments and matured their foundational capabilities⁴².

AI and sustainability

Ensuring ethical development, deployment, operation, and use of ethical AI also requires considering the broader societal and environmental impact. AI could help achieve sustainable outcomes if used correctly, in a global study from 2020 it was estimated that AI could serve as an enabler of 134 of the 169 targets of the Sustainable Development Goals⁴³. However, the same study indicates that 59 of the targets may experience a negative impact from the development of AI⁴⁴. For example, training and operating AI systems requires substantial computational resources, leading to extensive energy consumption. Various factors influence the carbon emissions produced by AI systems, including the model's parameter count, the data centres' power usage effectiveness, and the carbon intensity of the grid among other factors⁴⁵. For a more ethical and responsible use of AI, there's a push towards data and energy conservation, prioritizing data quality over quantity, optimizing neural networks through pruning, and selecting resource-efficient models, only opting for larger models when the benefits are substantial. Lastly, sustainability reporting and impact assessment are key, ensuring transparency and tracking progress in implementing AI solutions responsibly.

⁴¹ [Accenture, Nordic AI Maturity, 2023](#)

⁴² Ibid.

⁴³ Vinuesa, R., Azizpour, H., Leite, I. et al. The role of artificial intelligence in achieving the Sustainable Development Goals, 2020

⁴⁴ Ibid.

⁴⁵ Nestor Maslej, Loredana Fattorini, Erik Brynjolfsson, John Etchemendy, Katrina Ligett, Terah Lyons, James Manyika, Helen Ngo, Juan Carlos Niebles, Vanessa Parli, Yoav Shoham, Russell Wald, Jack Clark, and Raymond Perrault, "The AI Index 2023 Annual Report," AI Index Steering Committee, Institute for Human-Centered AI, Stanford University, Stanford, 2023

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