

Apply AI Strategy

Provision of Evidence

This document serves as input for call for evidence for the upcoming Apply AI Strategy of the European Commission.

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Executive Summary

The Apply AI strategy centers its vision for enhancing EU competitiveness on the premise that AI (particularly generative AI) will be a driver of productivity gains through automation, optimization, and improved decision-making. Specifically, it argues generative AI will increase efficiency and enable new types of products, services, and business models. As such, the strategy places significant emphasis on the integration of generative AI into key sectors, suggesting that such integration could ‘unlock’ up to EUR 3.4 trillion in economic value by 2030. This figure is used to justify the widespread deployment of generative AI technologies across public and private sectors. We argue that these premises provide too narrow a scope for a successful and sustainable Apply AI Strategy and suggest a number of elements that the Apply AI Strategy should at minimum address.

First, the Apply AI Strategy should address the critical need for alignment of the capabilities and limitations of state-of-the-art AI with the actual application demands. The call for evidence assumes AI (particularly generative AI) to possess uncontested capabilities for full scale deployment. It should however address the question of suitability of AI for a desired purpose, the level of maturity of current AI, and require a critical assessment of its multiple limitations.

Second, the Apply AI Strategy should be firmly grounded in the EU’s ethical, legal and societal vision for trustworthy AI: AI that is lawful, ethically aligned, and socio-technically robust¹. This requires an underpinning of AI applications with the Ethics Guidelines for Trustworthy AI, their compliance with the AI Act and other applicable regulation and alignment with what is to be considered socially acceptable and technically robust.

Third, the risks associated with labor automation and displacement must be mitigated by prioritizing the public interest, ensuring that technological progress enhances societal well-being and long-term sustainable innovation. Additionally, the strategy must address data inclusion, ensuring that the datasets driving AI development are representative, diverse, and equitable.

We believe there is an additional need to acknowledge and close the existing divide in AI capacity and access across EU Member States. If AI is to be applied to all sectors without supporting those Member States that lack robust verticals, this gap could be entrenched and undermine the EU’s collective strength. Adjacently, we recommend the strategic use and streamlining of the EU’s existing AI ecosystems, infrastructures and initiatives to help in this end.

From a technological standpoint, we argue that a shift away from an exclusive focus on generative AI is necessary to future-proof the Apply AI strategy. Specifically, we believe there should be greater attention to other AI paradigms that may be more effective and suitable for certain sectors or contexts.

¹ Ethics Guidelines for Trustworthy AI, 2019

Finally, for the Apply AI strategy to integrate AI meaningfully across sectors, it must prioritize the development and retention of talent. To this end, we argue Europe is uniquely positioned to stimulate and leverage a robust pipeline of skilled researchers, professionals and students to dampen Europe's dependence on external sources.

1. Realistic Understanding of AI Capabilities and Limitations

A realistic understanding of AI capabilities and limitations is crucial for a sustainable strategy to apply AI EU-wide. Simply applying AI in any and all domains, sectors, and circumstances, without a proper matching of its capabilities vis-à-vis the desired outcome, could result in failed processes, lost investments, declining civic trust, loss of competitiveness, loss of profit, and even harm to humans and society at large. While the call for evidence refers to the AI Act as the primary guardrails for trustworthy AI deployment, it still remains to be evaluated whether the AI Act compliance indeed mitigates the risks resulting from AI mismatches. The Apply AI Strategy should address the question of suitability of AI for a desired purpose, the level of maturity of current AI, and require a critical assessment of its multiple limitations.

As inspiration we refer to the recent OECD paper: *Introducing the OECD AI Capability Indicators*². This paper matches the current state-of-the-art of AI capabilities against a number of human capabilities. The overall conclusion of the authors is that on a scale from 1 – 5 (1: AI being able to perform trivial tasks, and 5: AI being able to use expert judgement) current AI systems range between level 2 and level 3 on human capabilities such as language, social interaction, problem solving, metacognition and critical thinking, creativity, and vision.

2. Responsible, Sustainable and Strategic AI Deployment

We take issue with the narrow framing of innovation and competitiveness as pillars of the Apply AI Strategy in the call for evidence. At present, we believe the strategy will be overly focused on short-term economic gains without accounting for the broader societal and environmental dimensions needed for a long-term EU technological sovereignty. We argue this necessary broader vision, one that ensures AI systems within the European market are ethical, safe, and responsible, runs contrary to the messaging found in the current strategy, which emphasizes rapid AI deployment across sectors. We believe to achieve sustainable technological sovereignty, Europe must go beyond the mere application of AI in existing sectors.

2.1 Trustworthy AI as a grounding

Hence, the Apply AI Strategy should be firmly grounded in the EU's ethical, legal and societal vision for trustworthy AI: AI that is lawful, ethically aligned, and socio-technically robust³. This requires an underpinning of AI applications with the Ethics Guidelines for Trustworthy AI, their compliance with

² OECD (2025), *Introducing the OECD AI Capability Indicators*, OECD Publishing, Paris, <https://doi.org/10.1787/be745f04-en>.

³ Ethics Guidelines for Trustworthy AI, 2019

the AI Act and other applicable regulation and alignment with what is to be considered socially acceptable and technically robust.

2.2 The EU AI Ecosystem

Core foundational elements needed for long-term innovation capacity and the reduction of non-EU dependence include the sovereign development of high-performance computing infrastructure, semiconductor manufacturing, cloud infrastructure, and data governance. From this perspective, we believe that instead of focusing primarily on applying AI in existing sectors, the EU should prioritize strengthening and streamlining the entire AI ecosystem. Various initiatives such as AI Factories, European Digital Innovation Hubs (EDIHs), Testing and Experimentation Facilities (TEFs), and provisions within the Digital Decade and the Chips Act offer promise.

Through our work in the EUSAiR project⁴, we are currently establishing highly improved coordination, communication, and collaboration structures among these various entities. To stimulate innovation capacity, we are fostering alignment, avoiding duplication of efforts and ensuring effective resource allocation based on actual need. We believe that further building on these collaboration structures, collective actions and shared goals are crucial for the EU AI ecosystem to function efficiently.

Second, we have anecdotally observed a pattern of misallocation/wasted public EU resources across AI-related projects, often because resources are directed towards initiatives lacking feasibility, long-term sustainability plans or legal compliance.

2.3 Recommendations

First, we recommend the Apply AI Strategy move beyond merely focusing on economic and productivity gains and embed trustworthy AI as a grounding.

Second, the EU AI ecosystem should be further aligned and connected, building on the work in EUSAiR.

3. Socially Beneficial Integration

As outlined, the core tenet of the call for evidence for the Apply AI Strategy revolves around fostering the integration of AI technologies in key sectors as well as the public sector, with the aim of unlocking EUR 3.4 trillion of economic gain by 2030. We raise several concerns with this premise.

3.1 Labour, Skills and Worker Health and Safety

Firstly, the notion that AI will generate gains through automation, optimisation, and efficiency overlooks the problem of labour displacement and replacement. Contemporary research in the field

⁴ <http://www.eursair-project.eu/>

of economics, labour studies and AI has examined how such purported productivity gains could occur at the expense of human workers, especially those undertaking ‘middle-skill’ jobs.^{5 6 7} As such, we question the extent to which the purported EUR 3.4 trillion gain will be driven by cost savings masked as ‘productivity gains’ (either from automating labor or increasing AI task complementarity) rather than tangible gains from valuable AI-generated tasks (e.g. through the creation of frontier innovations, new products, services, and tangible economic activity).

Indeed, tasks that are automated or made more efficient are likely to result in the reduction or elimination of human labour, either through full displacement or through the amplification of individual productivity that reduces the need for multiple workers. We see these trends as observable today in various sectors and industries, with the World Economic Forum revealing that 40% of employers expect to reduce their workforce in those areas where AI can automate tasks.⁸ As of 2025, the technology sector has seen 326 company layoffs, affecting a total of 76,440 employees (an average of 500 people per day).⁹ Most recently, on May 13th, Microsoft announced a significant workforce reduction, cutting 3% of its staff and thus impacting 6,840 employees.¹⁰

Moreover, automation can lead to skills erosion, the levels of which we cannot yet fully oversee, particularly for generative AI. Also the effect on working conditions, (mental) health and safety at work, particularly now that generative AI and the speed at which it is implemented at workplaces, needs urgent attention and evaluation.

In addition, we believe the anticipated EUR 3.4 trillion gain appears to be based on optimistic assumptions about the maturity and scalability of generative AI. Research by economists such as Daron Acemoglu have underscored the challenges of forecasting AI’s economic impact, emphasizing that such projections rest on speculative assumptions that underestimate the cost and complexity of integrating AI into existing processes.¹¹ Yet, Acemoglu offers a framework to analyze how recent AI technologies may affect productivity across different types of tasks to show productivity gains from AI are likely to be modest due to the challenge of AI undertaking ‘hard tasks’.¹² As such, Acemoglu (without differentiating between "easy-to-learn" and "hard-to-learn" tasks) provides the upper-bound estimate of a 0.66% cumulative increase in total factor productivity (TFP) over 10 years equivalent to an average annual increase of just 0.064%.¹³

Even if the projected EUR 3.4 trillion is accurate, the Apply AI Strategy fails to address the adjacent long-term implications: how these gains will be distributed, particularly if they are achieved through the displacement of human workers. Without the provision for a forward-looking strategy for

⁵ 2021, Tschang and Almirall, “Artificial Intelligence as Augmenting Automation.”

⁶ 2020, Acemoglu and Restrepo, “The Wrong Kind of AI?”

⁷ 2024, Intahchomphoo et al., “Effects of Artificial Intelligence and Robotics on Human Labour.”

⁸ 2025, “The Future of Jobs Report 2025.”

⁹ “Layoffs Tracker - All Tech and Startup Layoffs - by TrueUp.” : <https://www.trueup.io/layoffs>

¹⁰ Ibid.

¹¹ 2024, Acemoglu, “The Simple Macroeconomics of AI.”

¹² Ibid.

¹³ Ibid.

a fair transition, it is likely the economic benefits will concentrate in the hands of a narrow commercially-driven segment of stakeholders, as has been the case in the current trajectory of AI deployment. We see contemporary AI development characterised by Big tech companies capturing a disproportionate share of AI-related gains through exclusive control over GPAI models, computational infrastructure and proprietary data ecosystems.¹⁴ This concentration of wealth and opportunity could deepen extant systemic inequalities, which in turn would undermine the EU's long-term economic stability and competitiveness.

3.2 Strategic Integration

Secondly, we argue the integration of AI into sectors and public administrations should not proceed uncritically or uniformly. While the Apply AI strategy aims to apply AI across the EU's most productive sectors it does not necessarily follow that AI integration will yield gains in all cases. Indeed, some sectors may be better suited to implement AI applications than others depending on the nature of the products, services or work, the structure of the sector, and the potential risks involved.^{15 16 17} Since the generative AI hype cycle began, firms have reported only marginal utility gains from its integration.¹⁸ Some, like Klarna, are reversing their use of AI in customer service after widespread dissatisfaction with AI-driven support.¹⁹

In the context of strategic EU sectors, areas such as tourism, culture, and entertainment, while economically important, may see limited AI-related benefits given the value of domain-specific human knowledge and interpersonal interaction. Similarly, deploying AI in safety-critical sectors could introduce systemic vulnerabilities and long-term risks that outweigh short-term efficiencies. We also take issue with the proposal to apply AI to enhance 'judicial efficiency,' arguing this domain is not well-suited for optimisation or automation given the necessity for human judgement, deliberation and context-sensitive decision making.

In contrast, it could be the case that EU sectors such as agriculture, manufacturing, industrial production are more appropriate and effective for AI integration. In this vein, we additionally welcome the EU's focus on using AI to stimulate innovations in scientific, biotech, and pharmaceutical research. We believe this to be an effective sectoral application of AI because the current capabilities of AI including large-scale data analysis, code generation, pattern recognition, predictive modeling, and the creation of synthetic data are well suited to these areas.²⁰

¹⁴ 2024, Gambacorta and Shreeti, "Big Techs' AI Empire." <https://cepr.org/voxeu/columns/big-techs-ai-empire>

¹⁵ 2024, Acemoglu, "The Simple Macroeconomics of AI."

¹⁶ 2023, Bisio et al., "The Dynamics of Automation Adoption: Firm-Level Heterogeneity and Aggregate Employment Effects."

¹⁷ 2024, Windmann et al., "Artificial Intelligence in Industry 4.0."

¹⁸ 2025, *The Economist*, "Welcome to the AI Trough of Disillusionment.": <https://www.economist.com/business/2025/05/21/welcome-to-the-ai-trough-of-disillusionment>

¹⁹ Ibid.

²⁰ 2023, Wang et al., "Scientific Discovery in the Age of Artificial Intelligence."

3.3 Societal and Environmental Interest

However, we also maintain the Apply AI Strategy should adopt a broader conception of value that encompasses societal and environmental benefits, rather than merely solely on economic metrics. There is a tempting assumption that technological advancement, such as AI, will automatically lead to net-positive outcomes, also known as the ‘pro-innovation’ bias.²¹ However, the implications of a certain technology, both positive and negative, which will likely only become visible over time. Need equal attention and efforts. Moreover we advice prioritising AI applications that are not merely appropriate in terms of sector, utility and productivity but in principle also societally beneficial. To this end, the narrow and targeted application of AI (such as those exemplified by AlphaFold and AlphaEvolve) highlights the tangible potential of AI when deployed in the right contexts and guided by objectives rooted in social or scientific value.

3.4 Recommendations

First, we recommend the European Commission undertake targeted evidence-based evaluations to identify where AI can deliver the greatest economic *and* societal benefit.

Second we recommend that focus is place on if and if so how and where true and tangible benefits can be accrued. We believe these evaluations should also account for potential trade-offs. For example, this includes evaluating whether implementing AI in a specific sector or task is likely to result in consequences such as increased environmental impact, high risk of malfunction, or broader social disruption, which could lead to net-negative effects in the long-term.

Third, we recommend the strategy should include an examination and acknowledgement of the potential societal costs of AI deployment in these sectors beyond its anticipated economic gains. Indeed, currently, the strategy does not address how its implementation might affect EU workers, particularly those whose jobs may be displaced or whose labour could be devalued by AI systems. Nor does it consider how EU citizens may have an equitable share in the benefits of AI from these applications. This omission is concerning given the growing body of evidence showing that, when guided primarily by commercial interests, AI reinforces existing social inequalities and contributes to systemic harms, including discrimination and exclusion.^{22 23}

Fourt, the strategy should include provisions to support research and AI innovations that explore how AI can augment and empower humans. This could involve developing human-centered work workflows in which AI tools serve as instruments that enhance human capabilities rather than displace workers, erode skills or lead to diminished work satisfaction, or health or safety concerns at the workplace.

²¹ 2008, Rogers and Singhal and Quinlan, “Diffusion of Innovations”

²² 2021, Pandey and Caliskan, “Disparate Impact of Artificial Intelligence Bias in Ridehailing Economy’s Price Discrimination Algorithms.”

²³ Carlotta Dotto, 2025, “Facebook Enables Gender Discrimination in Job Ads, European Human Rights Body Rules | CNN Business.”

Such research should be participatory and interdisciplinary. It should engage directly with workers, worker representatives and sector-specific experts to ensure that AI deployment is guided by the needs, knowledge, and experiences of those affected.

In sum, we urge the European Commission to critically consider the long-term implications of integrating AI into strategic sectors and public administrations through a lens that extends beyond short-term economic gains and competitive advantage. Thus, the strategy should account for the broader societal, environmental, and interdisciplinary impacts of AI deployment. In addition, to ensure these developments serve the public good, the Apply AI Strategy should explicitly communicate a commitment to inclusivity, and long-term societal benefit.

4. EU AI Divide

Although the Apply AI Strategy is framed in ‘Europe first’ terms, it overlooks the way in which Europe is made of diverse member states, each with distinct capacities and needs. Specifically, it underestimates the extent to which there is an EU-wide AI divide in terms of AI accessibility, preparedness, and resource availability. For example, nearly half of the European population lacks basic digital skills, and a significant portion cannot afford reliable internet access.²⁴ Member states such as Romania and Bulgaria face particular challenges in digital inclusion, especially in rural areas where connectivity is limited and digital literacy is low, standing in stark contrast to many Northern European countries.²⁵ These internal digital and AI divides present an imbalance that undermine the potential of the EU’s single market.

This divide is compounded by sectoral specifications. As Guarascio et al. have found, high-tech service and capital regions (e.g., Berlin, Île-de-France, Prague, Vienna), pre existing local capabilities are likely to facilitate AI diffusion and enable AI technologies to complement existing knowledge-intensive economic activities, potentially resulting in positive employment outcomes.²⁶ Conversely, member states in southern Europe (e.g., the Greek islands, southern Italy, Andalusia) seem to be trapped in a circle of low growth, weak R&D investment, limited skills and low productivity.²⁷ Their economic structure is likely to hinder the initial adoption of AI and limit their ability to capitalise on its benefits later, potentially exacerbating existing economic disparities within the EU.²⁸ As such, Guarascio et al.’s analysis reveals the uneven exposure to AI technologies across regions but also the asymmetric distribution of capabilities and absorptive capacity needed to fully exploit AI’s potential.

²⁴ 2025, “Bridging the Digital Divide: A Call for European Unity - Eurocities.” : <https://eurocities.eu/latest/bridging-the-digital-divide-a-call-for-european-unity/>

²⁵ 2025, “THE DIGITAL DIVIDE IN EUROPE – A Growing Challenge – Europe Diplomatic Magazine.”: <https://europe-diplomatic.eu/society/the-digital-divide-in-europe-a-growing-challenge/>

²⁶ 2025, Guarascio, Reljic, and Stöllinger, “Diverging Paths.”

²⁷ Ibid.

²⁸ Ibid.

As a result, the Apply AI Strategy should account for those structural factors, such as sectoral specialisation, skills and innovation capacity, as well as the divide in AI within member states to ensure that all member states have the opportunity to integrate AI and reap potential benefits equally.

4.1 Recommendations

The Apply AI Strategy should provide targeted support for regions and countries in Southern and Eastern Europe with lower levels of digital/AI readiness to ensure a more equitable starting point across all member states. It should also account for each region's unique structural conditions, such as workforce skills, innovation capacity, and sectoral specialization in the strategy's implementation. Inclusive AI integration and capacity building initiatives are necessary to close the EU AI divide, provide each member state with equitable opportunities to participate in the AI ecosystem and ensure all can benefit from economic and societal gains. To this end, it could additionally be useful to stimulate leading AI companies and commercial actors in more advanced EU countries to share expertise and contribute to capacity-building efforts across the Union.

As such, we recommend that before AI is used to optimize labor and production processes in various sectors, a non-AI-driven process of optimization and efficiency should be implemented within EU governance structures, especially in funding, coordination, and collaboration mechanisms within the AI ecosystem. Indeed, Europe already possesses talent, infrastructure, and capabilities. Rather than reinventing the wheel, existing assets and infrastructure should be reoriented and more effectively mobilized.

5. Focus beyond Generative AI

We take issue with the call for evidence's and more broadly, the EU's increasingly narrow focus on generative AI. Particularly we are concerned with the way this paradigm is being positioned as the central pathway for advancing AI in Europe. We argue the current framing promotes generative AI as a silver bullet, which may undermine the EU's long term innovation and competitiveness.

While the generative AI paradigm through large language and multimodal models has grown increasingly capable, the current strategy appears to lack a critical appraisal of their limitations. These limitations have been recognised by the academic and technical literature, including issues such as:

- The opacity of model behavior²⁹
- Model biases³⁰
- Significant resource consumption³¹

²⁹ 2025, Fernández et al., "Opacity, Machine Learning and Explainable AI."

³⁰ 2025, Zhou et al., "Bias in Generative AI."

³¹ 2024, Amy Stein, "Chapter 21: Generative AI and Sustainability": <https://papers.ssrn.com/abstract=4935208>

For a more comprehensive review of current ethical and societal limitations discussed in the literature, please see Thilo Hagendorff's "Mapping the Ethics of Generative AI: A Comprehensive Scoping Review".³²

5.1 Future Proof AI Paradigms

Given these issues, we argue the current disproportionate emphasis and investment into generative AI risks locking the EU into a narrow technological trajectory. While generative AI currently dominates public discourse and attracts a lot of private investment, there is no guarantee it will remain the most relevant in the coming decade. In addition, it could be precarious given the field's relative immaturity. Indeed, AI is a broad domain which encompasses a variety of paradigms beyond generative models and these alternative paradigms may prove better suited for certain applications across sectors in ways generative AI may not be able to deliver. As such, focusing on generative AI lacks the foresight as to whether generative AI offers the most efficient, sustainable, or resilient foundation for Europe's AI future.

5.2 Recommendations

As a result, we argue the Apply AI strategy should widen its approach to consider a range of AI paradigms, rather than focusing on generative AI. Different sectors and public services may benefit more from alternative paradigms depending on their specific needs and contexts. In addition, a widened approach could mitigate risks associated with overdependence on a single, resource-intensive, and environmentally costly paradigm. It could also preserve the EU's capacity to adapt to future technological developments.

To this end, we additionally recommend the Apply AI strategy to recognise and support the diversity of AI research and development, which involves investing in the exploration of an array of AI approaches to ensure a sustainable and resilient innovation landscape.

6. Skills, Talent and Literacy

Finally, we believe the Apply AI strategy could benefit from a strong emphasis on cultivating and retaining AI talent across Europe. While infrastructure and investment are important, Europe's long-term innovation capacity will be dependent on its ability to develop, attract, and sustain a skilled workforce in these various sectors and public administrations. In the current context where the United States is revoking student visas and restricting immigration, we believe Europe has an opportunity to position itself as an environment for frontier AI research, education, and innovation. As such, the Apply AI Strategy should seize this moment by creating the conditions that incentivize the return of talent from abroad and attract leading researchers, students and professionals.

³² 2024, Thilo Hagendorff, "Mapping the Ethics of Generative AI."

6.1 Skills

Simultaneously, the EU should invest in widespread upskilling and reskilling programmes, particularly targeting sectors where AI is likely to be deployed. These programmes could teach workers on how to use AI as a tool that complements their tasks rather than replaces them. Such training could be tailored to specific industries and include practical education on how responsible AI applications can enhance productivity. In addition, sector-specific capacity-building initiatives should be introduced to equip workers and civil servants with the technical, legal, and ethical competencies required to utilise AI in their respective domains and sectors.

But more importantly, AI developers and data scientists should be upskilled in their capacity to identify, assess and mitigate adverse ethical and societal implications of AI and how to align AI systems with legal requirements. Rules such as those embedded in the AI Act and following from the European Charter of Fundamental Rights, or stemming from labour laws, product liability laws, consumer laws, the GDPR and sector/domain specific regulation (for example the MDR), have profound implications on if and how the AI system should be developed and deployed.

6.2 AI Literacy and Education

We are increasingly concerned about the potential decline in critical thinking and cognitive development among Europe's youth (who will form the workforce in the coming decade). This risk is increased by the growing use of generative AI in the context of education and the influence of social media, which may discourage learning and critical thought. As such, we argue the EU should take proactive steps to safeguard these effects by limiting the integration of (generative) AI in the education sector. For example, rather than promoting AI integration in classrooms, initiatives should teach young people on how to engage with AI technologies in safe, ethical, and effective ways. In addition, initiatives should help students understand how AI is likely to shape various professions and career paths, especially in light of this Apply AI Strategy, which is likely to have effects on vocational aspirations and capacities.

6.3 Recommendations

As a result we recommend that incentives should be developed to attract top AI talent for certain sectors and tasks by offering fellowships, grants and investment in European university-based AI laboratories.

Furthermore, the Apply AI Strategy could simultaneously fund targeted upskilling and reskilling programmes that focus on sectors most affected by AI integration.

Lastly, the Apply AI Strategy should fund targeted upskilling and reskilling of AI developers, computer scientists and data-scientists in ethical, legal and social sciences topics.

ABOUT ALLAI

ALLAI is an independent organisation that aims to foster, promote and achieve the responsible development, deployment and use of AI.

ALLAI's mission is to take a holistic approach to AI, taking into account all impact domains such as economics, ethics, privacy, laws, safety, labour, education, etc. ALLAI aims to involve all stakeholders in its mission: policy-makers, industry, social partners, consumers, NGOs, educational and care institutions, academics from various disciplines.

ALLAI was founded by the three Dutch members of the High Level Expert Group on AI, Catelijne Muller, LL.M., Prof. Virginia Dignum and Associate Prof. Aimee van Wynsberghe. Collectively, the founders have a broad expertise in AI: AI sciences, social impact, national and international policy, legal implications, and ethical impact.

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