The UN's Sustainable Development Goals 17 and 13 in Sweden:

Decoding the black box of AI governance through critical and democratic lens

"AI systems are still being deployed with little oversight or accountability.
We cannot sleepwalk into a dystopian future where the power of AI is controlled by a few people…Or worse, by opaque algorithms beyond human understanding.

We need rules. Safety. Universal guardrails.

How we act now will define our era."

(Guterres, 2024)

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ABSTRACT

This dissertation examines the emerging global artificial intelligence (AI) governance regime and the case study of Sweden. This is done by adopting some of the theoretical lenses of science and technology studies and specifically of philosopher Andrew Feenberg, with a focus on multi-stakeholder collaborations, and in line with the United Nations' Sustainable Development Goals (SDGs), specifically SDG 17 (Partnerships for the Goals), and SDG 13 (Climate Action). The analysis reveals a rapidly evolving global scenario, where Sweden is adopting a democratic and pragmatic approach, characterized by collaboration, ethical principles, and commitment to sustainable development. However, challenges remain in transparency and accountability, translating principles into practice, ensuring true inclusive participation and collaboration between actors, and navigating tensions between innovation and regulation. This ultimately emphasizes the need for socially responsible development and implementation of technology, multi-stakeholder collaboration, and democratic engagement. As AI rapidly transforms our world, with impacts across borders and industries, this research seeks to contribute to the critical debate on governing this transformative technology for the benefit of humanity and the planet.

Keywords: *artificial intelligence, AI, governance, multi-stakeholder, technology, society, Sweden, SDGs, STS, Andrew Feenberg.*

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1. Introduction

Technically speaking, the modern development of artificial intelligence (AI) technologies can be traced back to the mid-20th century, experiencing both cyclical periods of rapid progress or innovation, renewed public interest and investments, with breakthroughs promising to open unprecedented possibilities, and periods of stagnation and reduced funding caused by unfulfilled promises and technical limitations, often referred to as "AI springs and winters" (European Commission et al., 2021, p. 3). This has led to the current AI 'boom', with the most significant breakthrough in recent years being the invention of the transistor (Vaswani et al., 2023), paving the way for more advanced computer capabilities and the recent AI innovations and AI-based products and services. This mainly includes the latest dimension of AI technology, generative AI (GenAI). Indeed, AI has various dimensions, ranging from web search, and autonomous systems (vehicles, weapons, sensors) to GenAI, large language models (LLMs), and chatbots. Furthermore, "What distinguishes AI from other automation methods is the ability of AI technology to learn and become smarter over time" (Government Offices of Sweden, 2018, p. 4).

So, while AI is not entirely a new idea, especially in specialized circles, what is new and unprecedented is its wider and rapid popularization, use, and prominent entry into the public discourse thanks to GenAI and the development and commercialization of LLMs and the subsequent chatbots based on them. Software like ChatGPT (OpenAI, 2022) came out promising to revolutionize how we interact with machines and access information, even with a not-so-distant future of reaching artificial general intelligence (AGI). Here, we are not just reflecting on a new technological device(s), software, but also a phenomenon with huge potential implications for society, that in many ways is already prompting changes in various dimensions and sectors.

However, as AI rapidly evolves and integrates into society, this does not mean that its benefits will be automatically realized, nor that these will serve the public and planetary good without proper governance: "Artificial Intelligence (AI) is already having a major impact on society. The key questions are how, where, when, and by whom the impact of AI will be felt" (Floridi & Cowls, 2019, p. 2). Governing technological innovation is governing our future. As AI progresses, this is posing new governance challenges to ensure that benefits are maximized and shared, and risks diminished and contained. Like any new technology, AI has both potential benefits and risks: for example, it can help us address climate change by optimizing energy systems and reducing emissions (Rolnick et al., 2019) but its development and deployment also require unprecedented amounts of power, resources, and water to function

and evolve (Strubell et al., 2019). A double-sided coin of potential impacts that can have effects on practically any societal domain, from education to healthcare, sustainability, defense, and so on. Indeed, AI can be defined as a general-purpose technology that has a multitude of applications and impacts (Crafts, 2021). Overall, the rise of AI technologies and their transformative impact across a wide range of issues pose new challenges to policymakers and other stakeholders both nationally and globally. Whether one looks at the near, medium, or long term, there arise a myriad of legal and ethical challenges and even existential risks that societies need to address. As such, we need to ensure that AI is developed not only following the logic of economic gains and competitive advantage but also by including human, ethical, and environmental considerations (Floridi et al., 2018). Specifically, governing AI for the people and the planet could only be done with three assumptions. (1) AI governance is Data governance. AI depends on collecting data, and as such how we collect, handle, regulate and the quality of data are essential to the achievement of data governance. AI ethics cannot be implemented if data governance is not in place. (2) There are now issues that we can't solve without the help of AI. (3) We need multi-stakeholder approaches, the involvement of experts from the governments, private sector, research community, academia, and civil society, from all the fields and from all over the world. (Cath, 2018, p. 5). As such, the aim of this research is to first analyze the emerging global AI governance regime, map the main multi-stakeholder organizations, actors, and initiatives, and then present the case study of Sweden.

Sweden approach to AI and AI governance is analyzed, with a strong focus on multi-stakeholder partnerships, data management, and overfall ethical, sustainable, and responsible development and implementation of AI technologies in alignment with the United Nation's Sustainable Development Goals (SDGs), in particular goal number 17 (Partnership for the Goals), goal 13 (Climate action). The primary focus is not on defining the benefits and risks of AI[1], but rather on examining the emerging governance of AI, from its main and global dimension to the national case study of Sweden. There is no single research question that guides the analysis, but the aim is to provide a comprehensive understanding of the current state of AI governance and analyze the implementation, regulation, measures, and sociopolitical dimension around AI. With a multidisciplinary approach, various theoretical lenses[2], mainly from the fields of science and technology studies, political science, and

[1] For this, you can refer, for example, to research like Floridi et al. (2018)
[2] These are presented and discussed more in detail in the literature review section

sociology, lenses are used to guide the analysis and include critical considerations about the potential societal implications of inadequate AI governance, the inclusivity of governance processes, and the underlying power relations among different actors. Among these the aim is to avoid deterministic views of technology, recognizing the significant role of human agency in shaping the development, deployment, and governance of AI technologies, and the acknowledgment that technological "artifacts have politics" (Winner, 1980), meaning that they also embody and reinforce certain power structures, values, and societal arrangements, including, for example, extending or not the participation to civil society. Primary focus will be given to the ideas of philosopher Andrew Feenberg, its emphasis on the importance of democratizing technological decision-making, and how AI, its development and governance are intertwined with and mutually shape the wider political and societal context. The goal here is not just to describe the Global or Swedish context, but also to use them as a window into the broader considerations surrounding AI development and implementation. In doing so, this paper seeks to contribute to ongoing debates about the societal implications of AI and to offer insights for policymakers and scholars grappling with these issues.

1.1. Methodology

"The research employs qualitative research methods. Some of the main state-of-the-art (SOTA) AI tools for writing and research, namely Claude and Elicit, are used[3], and properly cited to support the research and writing processes" (Anthropic, 2024). The dissertation draws from various sources, including academic publications, government reports, policy documents, and websites of relevant initiatives and organizations, both from the global and national (Swedish), in alignment with SDG 17 and SDG 13. As mentioned before, various authors from different fields are presented to support and analyze the findings. These include, among others, concepts like multi-stakeholder(ism), Feenberg's democratization of technology, Abbott & Snidal governance triangle[4], and Floridi and Cowl's ethical frameworks on AI.

1.2. Limitations

Limitations include the lack of extensive quantitative data and research on AI governance, specifically in the Swedish context. This can be attributed to the fact that AI governance is an emerging area of study with relatively limited publications and documents available for analysis; a lack of AI Governance and policy-related information that stands in stark contrast with the numerous publications on new AI applications, that in opposite make it difficult to

[3] A brief explanation on how the software were used is included in the annexes
[4] An image is included in the annexes, section 9, figure 3

capture all the most recent AI (technical) developments. Furthermore, as AI governance is mostly a global issue, most of the literature focuses on the global context, with this dissertation departing from a global analysis to then present the case of Sweden. The second major limitation is the absence of a specific regional analysis of the EU context. The EU AI Act was just adopted in March 2024 (European Parliament, 2024), and aside from research time constraints, its implementations and effects in Sweden are still in becoming. As such, a specific analysis of its implications was not included. At the same time, the EU regulatory framework is included by briefly analyzing the GDPR application in Sweden. Notably, no significant linguistic limitation was encountered when analyzing documents in Swedish thanks to the availability of instant translation software.

2. Literature Review

The "Governance Triangle" framework, proposed by (Abbott & Snidal, 2009) represents a key reference to help understand and structure this dissertation analysis of multi-stakeholder governance approaches, especially in categorizing actors and organizations as well as understanding their interactions. Furthermore, the concept highlights the increasing role of multi-stakeholder initiatives, especially private ones (including AI), helping modelling the interactions between the private sector, the public one, and civil society, that shapes any governance structure. The UN's SDGs provide an additional lens and framework of analysis, with this dissertation that will also serve as an example to operationalize SDGs Targets 17.16 and 16.7, as well as SDG 13. Vinuesa et al (2020) emphasize the potential for AI to both enable or inhibit the achievement of SDG goals and targets, while all of Sweden's publications and government policy documents highlight the link between AI governance and sustainability. Nonetheless, the existing literature on AI governance is still largely underdeveloped, with the main sources for this dissertation coming from broader literature on the governance of emerging technologies, particularly the Internet. In other words, while there is some literature on global governance, and of governance of new technologies broadly, the same could not be said for specific publications on the emerging AI governance regime. Most of the sources of this literature come from national Swedish reports, and data from AI initiatives such as OECD.AI and the United Nations (UN). Overall, there is an abundance of technical publications on AI advancements in comparison to policy documents and social sciences publications. Additionally, academic publications that specifically focus on the Swedish AI context (Toll et al., Dawood, Hall, and Löfgren) are analyzed throughout the text.

The main theoretical basis upon which this dissertation underpins a critical view of technology and society that aligns with the social construction of technology theory (Cozza, 2021, pp. 153-163), which affirms human agency and emphasizes that technological artifacts are not purely neutral, technical, or deterministic, but shaped by social, political, and economic factors (Feenberg, 1999, pp. 9-10). In other words, the idea that technology (AI) and society influence each other and are deeply intertwined; that technology in advanced industrial and capitalistic societies can be used as a form of control (Marcuse, 2003) and surveillance (Zuboff, 2020), with huge implications and risks for personal rights and privacy; and that technology can embody specific forms of power and authority, ideas, interests, agendas (Winner, 1980). Importance here is given to Feenberg's ideas, which can serve as the perfect basis upon which build this analysis. Feenberg critiques the deterministic and instrumentalist views of technology, which considers it as an autonomous force that shapes society or just a tool for achieving predefined ends, and instead argues that technology is not neutral but embodies social and political values. He developed the notion of substantive rationality, an idea that incorporates social and political values into technological design and use, recognizing that technology is not simply a value-neutral tool but rather embodies certain choices, power relations, and social imperatives. Drawing from Marx and Foucault, Feenberg (2005, p. 53) also refers to the concept of operational autonomy, the freedom of managers and administrators "to make independent decisions about how to carry on the business or the organizations, regardless of the views or interests of subordinate actors and the surrounding community". This operational autonomy grants those in power not only significant decision-making, but also "enables them to reproduce the conditions for their own supremacy at each iteration of the technologies they command", entering in a pure technical relation to the world, completely insulated from the rest and safe the consequences of their actions. This autonomy often leads to a narrow, technocratic worldview, justifying the technical rationality underpinned by it, a rationality that prioritizes efficiency and productivity over broader social and ethical considerations, and sees these two dimensions as completely separate. This way, those in power may view their decisions as purely objective and rational, failing to recognize the ways in which their actions are influenced by their own interest and biases, possibly resulting in the disregard for the concerns and well-being of those affected by their decisions. Another key concept is the idea that technology is ambivalent (Feenberg, 2010). "For every aircraft designer, there is a bomb builder somewhere" (Feenberg, 1998, p. 2), meaning that it has a dual character, an idea that also applies to the individual level: on one hand it can empower individuals, facilitate

communication, and improve quality of life, acting as a source of liberation; on the other hand, it can also be designed and used as a tool for control, surveillance, and exploitation, a source of domination. A characteristic that further emphasizes the importance of critically considering the social dimension in which technology is both developed and deployed, as these shapes the meaning and impact of technology on society. Indeed, how individuals experience and use technology for is another central focus of Feenberg's philosophy. He argues that technologies, as they can embody certain values and interests, can also influence how users experience their autonomy and freedom. Overall, by emphasizing how technologies always embody certain values and interests, Feenberg calls for a more democratic and participatory approach to technological design and governance, one that can empower users and communities to actively shape the technologies that affect them. From this, he, and this research, advocate for a profoundly democratic view of technology, a view that acknowledges that the design of technology is an "ontological decision with political consequences", emphasizing the need for democratic and inclusive decision-making in shaping the trajectory of technology: "What human beings are and will become is decided in the shape of our tools no less than in the action of statesmen and political movements […] The exclusion of the vast majority from participation in this decision is profoundly undemocratic" (Feenberg, 2002, p. 3). In other words, the belief that technological decisions should involve collective participation rather than being solely governed by experts or (private) corporations. This is particularly relevant in the context of AI governance and the focus of this dissertation on multistakeholder cooperation and inclusion of civil society. Furthermore, as technology shapes the lives of everyone, this motivates the need for what Feenberg calls "technical citizenship", or a form of agency for all people in the technical domain (Feenber 2011, pp. 1-5). Agency that has three conditions: "knowledge, power, and appropriate occasion" (Feenberg 2011, p. 1). In this regard, Feenberg addresses one of the main objections to the democratization of technical change: the question of legitimacy, or the argument that only experts have the necessary knowledge and skills to make decisions about technical issues, an idea that underpins a technocratic worldview that considers only technical contributions as valuable additions. On the contrary, he believes that public participation can enhance technological development not only by critically bringing issues to the surface early on, but also because the newly acquired direct involvement with the technology will make "certain interests salient that might otherwise have remained dormant or had no occasion to exist at all" (Feenber, 2011, p. 7) … these are the "participant interests" of everyone engaging with technology, that comprehends different, still valuable perspectives

that are often not known even considered by technical experts. Thus, by involving a wide range of stakeholders, including civil society, we can ensure that a broad range of diverse (thus beneficial) perspectives and interests can be included, and potential (social) problems and consequences better identified and addressed before they become embedded in the technology's design. This is also done with the awareness that technical principles alone are insufficient to determine socially mediated, acceptable, and desirable technological choices. Here opens the space for public intervention, and the basis upon which civil society and individuals can exercise their agency and ensure that ethical, environmental, and human-centric considerations are included; in this, policymakers' agency lies in giving them appropriate governance and inclusion mechanisms, the proper occasion, and conditions to do so. This can ultimately create a reinforcing process in which, as individuals become enrolled in technical networks, they also become motivated to address its failing and may even acquire power over its design and development (Feenberg, 2011, p. 7). Finally, Floridi and Cowl's (2019) ethical frameworks on AI further acknowledge too the importance of developing and governing AI systems that are aligned with and account for human values, emphasizing the need for responsible, transparent, and accountable AI integration into society from development to governance. This research posits the same, with the belief that AI technologies, given their transformative potential and far-reaching implications, necessitate a similar approach and the need to ensure that Sweden truly considers public and planetary interests through inclusive, multi-stakeholder decision-making processes.

3. SDG 17 & SDG 13 and AI Governance

The United Nations Sustainable Development Goals (SDGs) were adopted in 2015 as a universal call to action to end poverty, protect the planet, and ensure peace and prosperity for all by 2030. The 17 SDGs are interconnected, meaning that action in one area will affect outcomes in others, and cover a wide range of social, economic, and environmental challenges and actors: "The creativity, know-how, technology, and financial resources from all of society are necessary to achieve the SDGs in every context" (UN, n.d.-c). Vinuesa et al. (2020) try to assess how AI may enable or inhibit SDG targets, emphasizing the importance of data governance frameworks and responsible AI development through cooperation "We are at a critical turning point for the future of AI. A global and science-driven debate to develop shared principles and legislation among nations and cultures is necessary to shape a future in which AI positively contributes to the achievement of all the SDGs" (Vinuesa et al., 2020, p. 7). This dissertation focuses on two specific goals, namely SDG 17 (Partnerships for the goals), and target 17.16, and SDG 13 (Climate action). Specifically, SDG 17 aims at

strengthening global partnerships to support and achieve the targets of the 2030 Agenda, bringing together national governments, the international community, civil society, the private sector, and other actors (United Nations, n.d.-b). Two targets within SDG 17 are of particular interest in the context of this dissertation: target 17.16 seeks to "enhance the global partnerships for sustainable development complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology, and financial resources, to support the achievement of the SDGs in all countries"; and target 17.17 on "encouraging and promoting effective public, public-private, and civil society partnerships, building on the experience and resourcing strategies of partnerships". This target is measured by indicator 17.16.1, which looks at the "number of countries reporting progress in multi-stakeholder development effectiveness monitoring frameworks that support the achievement of the SDGs" (UN, 2017; UN, n.d-b.; DISQ, n.d). On the other hand, SDG 13 urges countries to take urgent action to combat climate change and its impacts. It aims at strengthening resilience and adaptive capacity to climate-related risks, integrating sustainable measures into national policies, and improving education and awareness on climate mitigation adaptation. Ultimately, linkages are also made with SDG 9, specifically target 9.5: "Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending" (UN, n.d.-a). In the context of AI governance and the scope of this research, these goals and targets are very relevant, as they reflect the urgent need to create multi-stakeholder partnerships that can ensure AI is developed and used in a transparent, accountable, and inclusive way. Collaboration and governance mechanisms among diverse actors, the private sector, academia, civil society, and international organizations, are needed to address the complex challenges that AI is and will provide, and to harness its potential for social good (Vinuesa et al., 2020). More importantly, as in recent years the private sector has taken the lead in AI R&D investments (OECD, n.d.-a), is crucial to avoid one of the main common issues related to the governance of new emerging (mainly privately funded and developed) technologies: namely the effects of the fast pacing technological development resulting in the inability of governments and public authorities to keep up, leaving more epistemic authority, thus agency and decision making power in the hands of these private entities. This phenomenon has been observed in the case of social media platforms, where the rapid growth and widespread adoption of these technologies have outpaced in many areas the (legal) ability of regulators to effectively

oversee and manage their impact on society (Flew et al., 2019). A clear example of that is the creation of private initiatives like the Facebook Oversight Board (Meta, n.d.), an independent body created by Meta to review and make binding decisions on content moderation cases, the result of the absence of clear and comprehensive regulations by public authorities in which: private entities fills this vacuum and become self-regulators, leaving them with disproportionate agency in managing their impact on society. This is also reflected by the fact that "as the AI industry matures, it also increasingly moves to proprietary models and favors commercial over common interest (Schmitt, 2022, p. 310); the most notable example in this sense is the trajectory of OpenAI (Quach, 2019; Hao, 2020, n.d.). Initially created in 2015 as a non-profit research laboratory to promote and develop friendly AI in a way that openly benefits the whole of humanity, in 2019, it transitioned to a for-profit company called OpenAI LP, favoring closed-source development and proprietary models such as GPT series, over its initial purposes of serving as an open-source hub for collaboration and sharing of information. In other words, increasing commercialization and competition are more and more common in the evolving AI landscape; this in turn may be problematic for responsible AI development, as it can lead to a lack of transparency, reduced collaboration, increased competitiveness, and focus on short-term profits over long-term safety and ethical considerations. The shift in priorities of OpenAI is only one of the examples of various organizations shifting from their initial principles and missions of promoting openness and collaboration in AI technologies to more closed, profit-driven approaches. This suggests that in the rapidly evolving AI landscape, as AI companies and organizations grow, they face increasing commercial and public pressure, with the risk that their original missions and values may be compromised. Ultimately, this can potentially hinder the responsible development of AI technologies that prioritize societal benefit over commercial interests, or that at least even account for it. On the other hand, another possibility in this regard is highlighted by Capabasso and Umbrello (2023), analyzing how SDG 17 may "encourage Big Tech corporation to strengthen multi-stakeholder partnership that promotes effective public-private and civil society partnerships and the meaningful co-presence of non-market and market values" (p. 231), and how the concept of 'social license to operate' can foster trust and collaboration between different stakeholders to support the achievement of the SDGs and AI for Social Good. This concept "can be adopted as a practice by digital business models to foster trust, collaboration, and coordination among different actors – including AI researchers and initiatives, institutions and civil society at large" (Capabasso and Umbrello, 2023, p. 231). So, even if many issues currently exist related to the over-agency and authority in AI

development and deployment by the private sector, there are possible solutions, such as the concept of social license to operate to address these. Still, at the current state, there are questions on how to ensure that the public interest, society, the planet, and ethics, are put first, rather than profits, the expected primary concern of any private company; this, in turn, reflects why it is essential to develop multi-stakeholder and multidisciplinary governance mechanisms frameworks and regulations, and subsequently, initiatives, between private companies, public authorities, academic institutions, and civil society, to ensure that AI is aligned with societal values and goals (including the SDGs), as reflected by SDG 16, and the selected 17.16 and 17.17 targets.

4. Global Context Regarding SDG 17 & 13 and AI Governance

The global landscape of AI governance is rapidly evolving, with various international organizations, governments, and private entities recognizing the need for responsible AI development and deployment, and for setting norms, rules, standards, and principles at the global level.

4.1. Current Status, Main Actors, and Initiatives

Schmitt's (2022) research provides a comprehensive overview of the nascent global AI governance regime by mapping out the main actors and initiatives. "The rapid advances in the development and rollout of AI technologies over the past years have triggered a frenzy of regulatory initiatives at various levels of governments and the private sector […] the analysis shows international organizations have high levels of agency in addressing AI policy […] and the consolidation of the nascent AI regime, a polycentric and fragmented landscape which mainly gravitates around the proactivity of the Organization for Economic Co-Operation and Development (OECD)" (Schmitt, 2022, p. 303), with the UN following suit. This dissertation focuses on the main initiatives and actors at the global level, namely the prominent role of the OECD and the UN, the Global Partnership on AI (GPAI), and the Partnership on AI (PAI), as well as citing some civil society actors and initiatives. More importantly, Schmitt observes that "Even if AI is a novel technology going beyond the scope of established regulatory or legal governance mechanism, there is a tendency to address these new challenges within existing frameworks" (Schmitt, 2022, p. 304). This has important implications for how the AI governance landscape is currently developing. Utilizing existing governance structures and institutions could prove beneficial, as it would be more efficient and faster than creating entirely new ones. However, at the same time, many issues can arise from relying only, or too extensively, on established frameworks, mechanisms, and institutions. Indeed, existing frameworks and institutions may not be (and perhaps aren't) well-suited to address the unique

challenges posed by AI. This could lead to issues such as institutional path dependence, meaning that the trajectory of AI governance may be shaped more by the institutional structures and frameworks that already exist, rather than by what is best needed for AI governance. Additionally, it could exacerbate existing power dynamics and imbalances within established frameworks and institutions. An example can be drawn from the history of the global Internet governance regime and of the Internet Corporation for Assigned Names and Numbers (ICANN). ICANN was created to manage the Domain Name System (DNS) and IP address system for the benefit of the whole global Internet community, however, over the years it has been widely criticized for not properly including civil society, and for being too heavily influenced by U.S. interests, particularly in its early years. This was largely due to the U.S.'s historical role and strategic advantage in the development and management of Internet technologies. "ICANN's model of "multistakeholder governance has been subject to criticisms ranging from insufficient civil society participation; insufficient government authority; too much government oversight; too much American authority; questions about legitimacy" (Hofmann, 2016, p. 37). Hence, for the developing AI global governance, there is a risk to avoid: making the same mistakes and following the path of Internet governance and ICANN and, instead, giving a truly global outlook to AI governance from the beginning. This is crucial to ensure that diverse needs and perspectives from all (worldwide) stakeholders are considered and that AI technologies are developed and deployed in a responsible way that can benefit both humanity and the planet and reduce risks. All these factors could have the negative effects of stiffing AI development and innovation vis-à-vis their rapid development, as well as replicating existing problems and power imbalances. Considering the above, the best appears to strike a balance between leveraging existing governance structures, especially in this 'first' phase of massive AI development and deployment, but also allows for new governance innovations specifically created for AI.

4.1.1. The OECD

The OECD is an international organization created in 1961 to stimulate economic progress and world trade. The organization is at the heart of international cooperation for a variety of issues, with the key objective of interacting with countries, organizations, and any other relevant stakeholders worldwide to address pressing contemporary policy challenges. From 2016 this also extensively includes AI, with the OECD attempting to reinvent, positioning itself as one of the main points of reference in the emerging global AI regime. In the global context of AI, although the OECD does not have any regulatory or legislative power, what is important within its role and as result of its actions is the organization's displayed "soft

power, the ability to influence global AI governance through epistemic authority, convening power, and norm -and agenda-setting" (Schmitt, 2022, p. 309) and its willingness and attempt to reinvent itself as one of the main points of reference in the emerging global AI regime. The OECD was among the first international organizations to focus on and discuss the need for AI principles. In 2018 it created an experts' group, the so-called AI Group of Experts at the OECD (AIGO), whose work resulted in the publication and adoption in 2019 of the so-called "OECD Principles on AI", the "first set of intergovernmental policy guidelines on AI, including a commitment to trustworthy, human-centered AI (Schmitt, 2022, p. 309). Interestingly, AIGO comprised "over 100 experts from different disciplines and different sectors (government, industry, civil society, trade unions, the technical community, and academia) (Schmitt, 2022, p. 305). Then in 2020, it launched OECD.AI Policy Observatory (Perset, 2020), a continuously updating, comprehensive, interactive, and free-access database of all the main policy and regulatory AI initiatives around the globe, as well as of key AI metrics and measurements, to help policymakers implement the AI principles and recommendations and further inform the global discourse on AI governance. Ultimately it created the OECD.AI Network of Experts on AI (ONE AI), an informal multi-disciplinary and multi-stakeholder group with experts from the "government, business, academia, and civil society that provides AI-specific policy expertise and advice to the OECD, […], providing a space for the international AI community to have in-depth discussions about shared AI policy opportunities and challenges" (OECD, 2019, p. 5). The OECD principles, also referred to as the 'OECD recommendations', are not fixed, but flexible and continuously being updated to "be technically accurate and reflect technological developments, including with respect to generative AI" (OECD, 2019, p.3). As such they were revised in 2023. They are also complementary, meaning that, similarly to the SDGs, they should all be considered together. The Recommendation "contains five high-level values-based principles and five recommendations for national policies and international co-operation" (OECD, 2019, p. 4). The principles for responsible stewardship of trustworthy AI include: (1) Inclusive growth, sustainable development, and well-being; (2) Human-centered values and fairness; (3) Transparency and explainability; (4) Robustness, security, and safety; (5) Accountability. The principles focus on promoting beneficial outcomes for both the people and the planet, and so focusing on sustainable and inclusive AI development, respecting human rights and democratic values, as well as ensuring transparency and explainability, maintaining robustness, security, safety, and accountability. Particularly, ensuring transparency and explainability of AI systems is one of the main issues, especially regarding the latest frontier

of AI: GenAI and LLMs. Indeed, except for some open-source systems, a large part of the newest and most popular LLMs, including ChatGPT, are largely black-box systems, meaning that they can only be viewed in terms of their inputs and outputs, without any knowledge of how they internally work. This results in a general lack of transparency that makes it difficult to fully understand how these models function, and how outputs are generated (Cambridge Dictionary, n.d.). This is what Feenberg defines as the "process of closure", with the potential effects of producing "an artifact that is no longer called into question but is taken for granted", affecting the ability to detect and address potential sources of bias or errors, the political and social dimension within it, and ultimately accountability: "Before closure is achieved, it is obvious that social interests are at stake in the design process. But once the black box is closed, its social origins are quickly forgotten" (Feenberg, 1999, p. 11). This can be largely attributed to unregulated and unchecked private-led development, the absence of clear shared guidelines and ethical principles, and collaborations with other actors, mainly civil society, in the governance of AI. A deterministic veil that makes the technology appear as "purely technical, even inevitable", and has the risk of obscuring the social and political dimension behind its development, from questioning the functioning of the model, how it was trained, the possible violation in IP laws, environmental implications, and so on.

Overall, these principles emphasize the need to develop and deploy AI systems that can augment human capabilities, reduce inequalities, protect the environment, respect privacy and non-discrimination, enable human oversight, manage risks, and hold AI actors accountable. On the other hand, the five proposed recommendations for national policies and international cooperation aim to support the implementation of these principles, calling on governments to take action in this sense. Overall, these recommendations recognize the need for long-term public and private investment, the development of open and representative datasets for AI training, the empowerment of people with the skills needed to thrive in an AI world, the promotion of cross-border collaboration, and the overall the importance of balance between promoting AI innovation while also protecting the public interest. As mentioned above, all these actions and initiatives resulted in the OECD having a considerable epistemic authority and norm-setting power in the context of AI governance. This is reflected by the adoption of their AI principles and recommendations not only by all of the OECD members, but also by other nations such as Argentina, Brazil, Costa Rica, Malta, Per, Romania, and Ukraine, signaling international appeal; by the decision of all of the G7 members to create GPAI initiative, anchoring it to the principles, and hosting its secretariat at the OECD headquarters itself (OECD, 2020); and ultimately by the endorsement of the AI principles by the G20,

which also “includes China and Russia, thus giving it an even broader international reach” (Schmitt, 2022, p. 309). In summary, all of this reflects the existing OECD sphere of influence on the emerging AI governance regime, both organizationally and normatively, as well as its commitment to trustworthy, and ethical AI development and deployment by recognizing the need for international dialogue and cooperation, and for multidisciplinary and multi-stakeholder mechanisms at the global level.

4.1.2. THE UN

The UN is also taking an active role in emphasizing the need for responsible AI development and deployment, as well as the importance of multi-stakeholder collaborations and alignment with the SDGs to do so. In August 2023, UN Secretary-General António Guterres issued a call for experts, nominating 1800+ individuals from across 128 countries tasked with exploring AI governance options (UN, 2023b). This led to the creation of the High-Level Multistakeholder Advisory Body on AI in October 2023 (UN, 2023c): an independent group, comprising 38 experts from the government, the private sector, civil society, and academia tasked with analyzing the risks, opportunities, and international governance options of AI: “Experts with deep experience across government, the private sector, technology, civil society, and academia have been tasked with supporting UN efforts to ensure AI is used for greater good of humanity” (UN, 2023b). A multistakeholder, multidisciplinary, and diverse initiative as it encompasses representatives from various areas-sectors, is gender-balanced, geographically diverse, and spans generations. The Advisory Body’s work is guided by the recognition that AI presents distinct global challenges and opportunities that the UN is uniquely positioned to address. It aims to coordinate and unify all the various AI governance initiatives that are emerging all around the world into a coherent, interoperable whole, grounded in universal values agreed by UN members and adaptable across various contexts. In its first interim report released in December 2023, the Body identified key enablers for harnessing AI for humanity, including inclusive access to data, computing, knowledge, and talent, as well as critical challenges to be addressed, including bias, accountability, transparency, and potential misuse. The culmination of this advisory process is the creation of a Global Digital Compact (GDC) by UN member states at the Summit of the Future in September 2024. The GDC outlines shared principles, policies, and goals to maximize the benefits and mitigate the risks of AI (UN, 2023a). These emphasizes the need to move beyond (industry) self-regulation and establish multi-level governance frameworks, “introduce harmonized cross-border principles, align AI technology through multi-stakeholder collaboration, and incentivize digital investment towards solving global

challenges (UN, 2023a, p. 4). Furthermore, the GDC recognizes that a global approach is needed for effective and beneficial governance of digital technologies, including AI: “A global approach is the only way that governance of digital technologies can help close existing gaps and promote new ones from emerging. Only by incrementally aligning national, regional, and industry tech governance approaches around common principles and goals we can deliver on the promise of an inclusive digital future for all” (UN, 2023a, p. 6) Among the main initiatives promoted by the GDC we have an annual multi-stakeholder digital cooperation forum, the establishment of a High-level advisory body for AI to align and harmonize regulatory standards at all levels and sectors, and the creation of a digital human rights advisory mechanism to ensure that human rights and the rule of law frameworks are considered and upheld (U., 2023a, p. 8). The goal is to build a common framework for AI by enhancing and coordinating the regulatory capacity of public sectors around the world, so to ensure that new AI regulations and “public procurements advance inclusion, safety, and address arising risks” (UN, 2023a, p. 8). The work of the GDC involves collaborative processes, with the permanent missions of Sweden and Zambia serving as co-facilitators in the negotiations and drafting processes. Indeed, Sweden is playing a very active role in the development of the GDC, releasing, in collaboration with Zambia, a Zero Draft (UN, 2024), to serve as a basis for intergovernmental negotiations” (GIP Digital Watch Observatory, 2024), reflecting the country’s commitment to AI governance at the international level and its willingness to play a leading role in the emerging AI global governance regime. The document contains, among others, specific commitment related to AI governance, including the creation of an International Panel on AI “to conduct independent multi-disciplinary scientific risk and evidence-based opportunity assessments and to initiate an annual [multi-stakeholder and multi-disciplinary] global dialogue on AI governance with expert and representatives of civil society, academia, the technical community, private sector, and of government AI safety institutes or other equivalent offices” (UN, 2024a, p. 10).

4.1.3. GPAI

GPAI is a state-led initiative, originally introduced in 2017 by Canada and France, and officially launched in 2020. It is composed of 29 member countries, with a Secretariat, that as mentioned in section 4.1.1, is hosted at the OECD headquarters, creating a synergy between “GPAI’s scientific and technical work and the international AI policy leadership provided by the OECD” (GPAI, n.d.-b). Indeed, if the OECD is acting more as an advisory body for policies, GPAI is more an expertise-based initiative, focusing more on scientific and technical research on AI. There is also a Council, that provides direction to the initiative and is

responsible for all major decisions, including new memberships, as well as various working groups, focusing on five main themes: responsible AI, data governance, the future of work, innovation, and commercialization. Specifically, these working groups undertake applied projects-research on specific AI issues, to "support and guide the responsible development, use, and adoption of AI that is human-centric and grounded in human rights, inclusion, diversity, and innovation, while encouraging sustainable economic growth; facilitate international collaboration in a multi-stakeholder manner; and monitor and draw on work being done domestically and internationally to identify knowledge gaps, maximize coordination, and facilitate international cooperation on AI" (GPAI, n.d.-a). The initiative also hosts two annual multi-stakeholder experts group plenaries, "where 100-150 experts from science, industry, civil society, trade unions, international organizations, and governments […] discuss projects for forward-looking collaboration" (GPAI, n.d.-b) and produce an annual report on the main AI developments and recommendations based on the results of the working groups. "The GPAI is arguably the most advanced global AI governance instrument to date, with a permanent secretariat and a relatively broad membership base" (Schmitt, 2022, p. 307) with the notable absence of major global actors like China. Interestingly, the experts involved, from the Plenary to the working groups, are not only nominated by members but also self-nominated, with anyone with relevant expertise, having the possibility to freely apply to participate. This is particularly important for a truly multi-stakeholder, and more far-reaching and inclusive initiative. At the same time, one of the main declared purposes of GPAI, creating an inclusive, multi-stakeholder, global initiative, seems to contrast with the prominent role and influence of the US within it, with political development and geopolitical strategical consideration within the US significantly influencing its development. As noted by O'Brien (2020) and Schmitt (2022), initially the initiative didn't take off, at least until 2019, when the Trump Administration changed course, "considering the GPAI as a useful tool in restricting China's influence on the emerging global AI governance system" (Schmitt, 2022, p. 307).

4.1.4. PAI

The Partnership on AI (PAI) was born in 2016 as a business-centered alliance of private sector actors, between the biggest American tech companies (Apple, Google's DeepMind, Meta, Amazon, IBM, and Microsoft) at the forefront of AI development. It quickly evolved into a multi-stakeholder organization with more than 50 members organizations, "a non-profit partnership of academic, civil society, industry, and media organizations creating solutions so that AI advances positive outcomes for people and society" (PAI, n.d.-a), mainly

focusing on AI ethics and governance. More importantly, the organizations created the AI Incident Database (AIID) (McGregor, 2020; (PAI, n.d.-b), a publicly available repository aimed at disseminating "knowledge and improv[ing] the safety of AI systems deployed in the real world" (Schmitt, 2022, p. 310). As such, anyone can access the database and report incidents. This is a crucial tool in the emerging global AI governance regime, created with the acknowledgment that as AI systems are becoming increasingly integrated into critical domains and infrastructures, such as transportation, energy, healthcare, law enforcement, job recruiting, education, …, it is essential to have in place a formal system and processes where all actors involved can discover and learn from the mistakes of the past. "Avoiding repeated AI failures requires making past failures known" (PAI, n.d.-a). More importantly, this tool was modeled upon the examples of the Aviation and Computer security industries (PAI, n.d.-b), indirectly reflecting the recognition that AI technologies and their impacts are global, transcending borders as well as industries, thus requiring global governance and multi-stakeholder approaches.

5. Sweden's Approach to Innovation & AI Governance

5.1. Current Status

In the context of the emerging AI global regime, Sweden can serve as an excellent case study for AI governance with a focus on multi-stakeholder(ism) and sustainability. Sweden is known for its strong culture of innovation, ranking second in the 2023 Global Innovation Index (WIPO, 2023, p. 50). The country also has a long history of embracing new technologies and has been at the forefront of digital transformation, having a very high digital maturity, and highly developed digital infrastructures. Both Sweden's public sector and innovation ecosystem are characterized by high decentralization (21 regions, 290 municipalities, 350+ government agencies, numerous SMEs), a situation in which "collaboration becomes even more important as very few organizations individually are capable of building and managing necessary infrastructure, data, and solutions" (AI Sweden, 2024), hence an innovation ecosystem characterized by close multi-stakeholder collaborations between the government, private sector, academia, and civil society. Furthermore, Sweden is also one of the examples of a highly digitalized country with considerable AI potential and a well-developed IT infrastructure (Vinnova, 2018, p. 11). Sweden has taken a proactive approach, being among the first countries in the world, and first in the EU (European Commission et al., 2021, p. 8)[5] to, since 2018, start developing a

[5] A table is provided in the annexes, Figure 6

national AI strategy (Government Offices of Sweden, 2018). The development of this strategy and AI was supported by collaborative initiatives, such as the early mapping of AI's utility for Swedish industry and society promoted by the government and led by Vinnova[6], which involved the perspective of multiple sectors, organizations, and actors, as described in Toll et al. (2019) research. Vinnova is also funding the AI Sweden network to accelerate the use of AI by focusing on how different partners can add value. "The AI Sweden network acts as a catalyst for organizations that have the ambition to generate sustainable value using AI." (AI Sweden, 2020) Then, initiatives like AI, People & Planet in 2019 (AI, People & Planet, n.d.-a), and the establishment of the AI sustainability center in 2020 (European Commission et al., 2021, p. 15) suggest Sweden's ongoing efforts to develop responsible AI for the public good and sustainability. Hall and Löfgren (2017) highlight how there is a strong link between academic expertise and innovation policymaking in the country, with government agencies, Vinnova above all, and research centers and institutions like the Royal Institute of Technology playing a crucial role in promoting research and collaboration and connecting different stakeholders. Sweden's innovation approach is focused not only on collaboration but co-action between different stakeholders, with the tendency of the Swedish government to use more soft instruments, more cooperative and partnership-based approaches as opposed to strict regulation to maximize from the beginning the potential benefits and minimize risks of new (technological) innovations. Dawood (2021, p. 26) interviewed small AI organizations in Sweden, highlighting challenges in data governance and accountability due to limited policies and regulations. They found that in the absence of standardized rules and guidance, small AI organizations do not apply or consider applying ethical principles when developing their products, stressing the need to include Ethical AI considerations for the good since the early stage of AI development, and not only to end products.

5.2. Main Actors and Initiatives

5.2.1. The Swedish Government & Swedish National Approach to AI

The Swedish Government is the most active actor in the emerging Swedish AI landscape. As mentioned before, the Ministry of Enterprise and Innovation started outlining Sweden's national strategy in 2018, pointing out the general direction for AI in the country to create a basis for future policy actions and priorities: "The government's goal is to make Sweden a leader in harnessing the opportunities that the use of AI can offer, with the aim of strengthening Sweden's welfare and competitiveness" (Government Offices of Sweden,

[6] More information about Vinnova is provided in section 5.2.2

2018, p. 5). More importantly, Sweden's AI governance approach is guided by a set of principles that align closely with the SDGs, particularly, but not only, with the selected SDG 17 and SDG 13. Specifically, Sweden's national approach to AI cover 4 areas, the so-called "Key conditions for use of AI in Sweden" (Government Offices of Sweden, 2018, pp. 5-6): education and training, research, innovation and use, framework and infrastructure. This strategy is based on a pragmatic approach that recognizes both the benefits and risks that AI can pose to Swedish society, and the acknowledgment that "for AI to best contribute to strengthened Swedish competitiveness and enhanced welfare, Sweden must create the enabling conditions" (Government Offices of Sweden, 2018, p. 4). The recognition of benefits includes the acknowledgment that "AI has the potential to contribute significant benefits in a variety of areas through increased economic growth, and solutions to environmental and social challenges" (Government Offices of Sweden, 2018, p. 4), while risks include recognizing the possible negative impacts resulting from biased or manipulated AI training data, lack of transparency, risk for privacy, misuse, and hostile use. The first key condition is education and training; this reflects the need to develop a long-term supply of knowledge and expertise in the field of AI. This involves creating new AI-related higher education degrees: both technical and non-technical programs. Indeed, the interdisciplinarity of new higher education programs related to AI is seen as a key aspect to ensure that the emerging Swedish AI landscape considers ethical, safe, secure, and sustainable use of AI. As such, across the country, new second-cycle university degrees are emerging, both strictly technical, such as the new master in machine learning offered by Uppsala (Uppsala University, n.d.), and non-technical, such as the new master in Logic and Philosophy offered by Gothenburg University (University of Gothenburg, n.d.). Education and training also extend to professionals, from this comes the promotion of various courses, such as the MOOC "Elements of AI" (Vinnova, 2019) created to give professionals across various sectors the necessary knowledge to thrive in new AI-driven working environments. The second key condition is research, with Vinnova, the Swedish government innovation agency, tasked with promoting research by administering state funding for R&D. The third key condition is innovation and use. This condition stems from the need to develop not only theoretical (via the two preceding conditions) but also applied AI knowledge and projects. The fourth key condition is framework and infrastructure. This reflects the need to ensure access to data and infrastructure, such as computational capacity, in addition to appropriate national, European, and international frameworks. More specifically, the Swedish

Government acknowledges the need for a coherent and strategic AI policy: “AI needs to be guided by norms and ethical principles aimed at harnessing the benefits while minimizing the risk to both society and individuals” (Government Offices of Sweden, 2018, p. 10), as well as of frameworks that can balance the fundamental need for privacy, ethics, trust, and social protection with access to data needed to realize the potential of AI. This is true both for national, as well as international regulatory frameworks, with Sweden acknowledging the relevance of the EU’s GDPR in this sense. In other words, the Government has identified both the need to develop at the national level rules, standards, norms, and ethical principles for a risk-free, ethical, and sustainable AI, as well as promoting international standards and regulations in this sense. Regarding data access, it is also important to note that “Sweden’s public sector has an almost unique volume of high-quality data” (Government Offices of Sweden, 2018, p. 8), as well as a well-developed digital and telecommunications infrastructure, one of the main prerequisites for AI applications to create considerable benefits. In this sense, a notable initiative is the creation of Data Factory, “an infrastructure and knowledge environment where partners from all sectors can use state-of-the-art infrastructure and benefit from collaboration and interaction with AI Sweden’s technical, strategic, and legal experts” (AI Sweden, n.d.-c). Indeed, as mentioned in the above paragraphs, AI governance is data governance, and AI development and deployment requires extensive amounts of good quality data to be effective and beneficial, as well as to avoid dangerous biases and ‘errors’, such as discrimination or/and underrepresentation of certain groups. Sweden aligns its data ecosystem and regulations with the EU’s General Data Protection Regulation (GDPR). The Swedish Authority for Privacy Protection’s guidance on GDPR and AI aims “to create the conditions for combining the development and use of AI with good data protection. In this way, we want to promote development and digitization that takes place in a privacy-friendly way” (Integritetsskyddsmyndigheten, 2024). In other words, the need for clear regulations that can balance the need for data and rights protections with AI development and implementation. A prerequisite for this is developing multi-stakeholder partnerships between lawyers and technicians. So, when businesses process personal data in connection with the development or use of AI, they must adhere to the GDPR. “Personal data processing refers to all actions that can be carried out with personal data, such as collection, disclosure, reading, processing and storage, and that are fully or partially automated” (Integritetsskyddsmyndigheten, 2024). For the scope of this research, the focus on multi-stakeholder collaborations and sustainability, all these key conditions can be said to be

drafted with a strong multi-stakeholder approach: “For Sweden to reap the benefits of AI, all sectors of society must be involved; this is not an issue that the state, municipalities, county councils, academia, or private companies can deal with on their own […] Closer collaboration between societal actors is needed” (Government Offices of Sweden, 2018, p. 6). This was done both at the national and international level, by creating joint projects and staff exchange programs across public and private institutions, as well as by aligning regulations and policy to the GDPR framework, with the acknowledgment that “most of the world’s leading AI research is conducted beyond Sweden’s border” (Government Offices of Sweden, 2018, p. 7) hence, the need to maintain and develop cooperation with other countries and relevant international organizations. With AI sustainability as a cross-cutting theme in Swedish AI strategy. Indeed, in terms of climate action (SDG 13), Sweden has set ambitious targets to become carbon neutral by 2045 and has identified AI as a key tool to support this transition (Vinnova, 2020). “AI can contribute to new opportunities to meet the climate challenge in all its different dimensions: by contributing to accelerated emission reductions, by contributing to improved climate adaptation, and by stimulating climate innovation and deeper systemic changes, so-called transformation” (Galaz et al., 2021, p.41). Ultimately, Sweden's national strategy for AI envisions an active and leading role for the country in the emerging global AI governance regime: “Sweden can take the lead in ethical, safe, secure, and sustainable use of AI by actively working on the issues nationally and promoting it internationally” (Government Offices of Sweden, 2018, p. 8).

5.2.2. Vinnova & AI Sweden

Verket för innovationssystem, also known as Vinnova, is the main Swedish government agency for innovation systems that administers state funding for R&D in various areas, including technology, transportation, communication, and labor: “Our mission is to contribute to sustainable growth by improving the conditions for innovation. We do this mainly by funding innovation projects and the research needed to develop new solutions” (Vinnova, 2018, p. 2). More importantly, the agency has a clear collaborative and multi-stakeholder approach in doing so: “We stimulate collaborations between companies, universities, and other higher education institutions, public services, civil society, and other actors” (Vinnova, 2018, p. 2), both nationally and internationally. This is also true regarding their approach to AI. This collaborative approach is crucial for driving AI innovation, as it brings together the expertise, resources, and perspectives of different sectors and actors to accelerate the development and implementation of AI technologies, while also considering

the risk: “A positive AI development in Sweden thus demands efficient cooperation among many different actors and functions in society” (Vinnova, 2018, p.12). In 2017, before the launch of the national approach to AI, Vinnova was tasked by the Government to map out “how well AI and machine learning are used in Swedish industry, the Swedish public sector and society, and the potential that could be realized by boosting the use thereof” (Vinnova, 2018, p. 5). As such in 2018 they published a final report assessing the Swedish AI landscape, the opportunities and challenges of AI in the country, as well as the main AI projects being developed. According to the report, the potential of AI for Sweden lies in 3 main factors: Automating functions in established value chains, operations, and functions; developing new business models, products, services, and systems solutions; transforming value chains and sectors for brand new development tracks (Vinnova, 2018, p. 8). These factors demonstrate Sweden’s focus on leveraging AI for both public sector applications and business use cases, while also recognizing the potential for AI to drive broader societal and environmental transformation. Specifically, they also identify six broad and mutually dependent areas of applications for AI in both Swedish business and society: industrial development, travel and transports, sustainable and smart cities, health, financial service, and security: “Sweden’s greatest opportunities for competitiveness within AI lies within a mutual interaction between innovative AI application in business and innovative organization of society” (Vinnova, 2018, p. 17). More importantly, they acknowledge that AI can be crucial for Swedish sustainable efforts across all sectors, as well as for AI to “contribute to Sweden’s possibilities of achieving the goals in the 2030 Agenda for Sustainable Development” (Vinnova, 2018, p. 8), reflecting the main points of Vinuesa (2020) research. In this regard, in April 2020, Vinnova, in collaboration with other governmental age agencies, launched the call ‘AI in the service of climate’, an initiative aimed to “support projects using AI to help Sweden having no net emissions of greenhouse gases by 2045 or to adapt society to the climate changes”, providing fundings between five and seven million SEK, or between 400.000 and 700.000 USD approximately (Vinnova, 2020). However, as AI becomes more and more integrated both in the public sectors and society at large, this will also generate new challenges, such as leadership and adaptability in companies, public operations, and policy systems, labor market dynamics and unemployment, data privacy and ownership concerns, the risk of monopolies, the application of immature AI solutions in key infrastructures, the use of incorrect or biased data and algorithms, as well as security risks through conscious data usage and manipulation (Vinnova, 2018, p. 8). If Vinnova acknowledges the need to identify risks early on so they

can be preventively and proactively addressed, they also recognize that it is crucial to do this pragmatically, recognizing existing risks while also avoiding exacerbating non-existing ones. For example, one of the main rationale and concerns surrounding AI is the possible job disruption that these technologies can cause, the so-called risks of AI taking over human jobs; in this regard Vinnova's stance is clear: "The net effects of labor dynamics for the economy are largely very uncertain. Based on historical developments and new scenarios, there is no reason to assume, however, that the creation of new jobs will be slower overall than the pace of the jobs that will disappear" (Vinnova, 2018, p. 9). From both opportunities and risks, two elements are considered relevant to drive AI innovation in the country, namely the significance of a strong innovation leadership "in all sectors and at all levels" to lead AI adaptability efforts, both on individuals and operations; and of governance, that for a "safe and value-creating transformation of society as a whole must be strengthened considerably" (Vinnova, 2018, pp. 8-9); and a strong governance and coherent policy-making efforts capable of "generat[ing] innovative drivers that cross policy areas, government boundaries, administrative boundaries and geographical boundaries" (Vinnova, 2018, p. 21).. Overall, in the emerging Swedish AI landscape, Vinnova plays a pivotal role, both in terms of research, publishing extensive annual policy reports outlining the opportunities and challenges of AI in the country, as well as administering AI-related funds, by either launching directly new initiatives or funding promising projects. As described by Hall & Löfgren (2017), Sweden has a very developed (private) innovation ecosystem, comprising both big companies like Volvo, Ikea, and Ericsson, but also small and midsize enterprises (SMEs); in this regard, Vinnova has launched the Startup AI program (AI Sweden, 2020) to grant funds specifically to SMEs working with AI. However, the main and most significant initiative launched by Vinnova is the creation of AI Sweden in 2019: the Swedish National Center for Applied AI, an ambitious holistic program to foster the development of AI applications in Sweden. Its stated mission is "to accelerate the use of AI for the benefit of our society, our competitiveness, and for everyone living in Sweden" (Svensson, 2024). Specifically, AI Sweden serves as a national center, a hub for applied AI research and innovation, aiding and providing expertise for many AI projects, as well as a platform for collaboration among all the different stakeholders. The initiative, which is broadly funded and not-for-profit, comprises more than 120 partners, with a multi-stakeholder approach, from the private and public sectors, academia, as well as civil society. Alone in 2023, it has also funded more than 200 MSEK, or approximately 19 million USD (AI Sweden, 2023-a). The 2023 impact report

released by AI Sweden, highlights the main achievements over the past year, as well as is broader and inclusive participation: “The power of AI Sweden’s partner network is visible in everything from the open release of the first large Nordic language model, GPT-SW3, to innovative projects in healthcare, energy, and public sector implementation.” (AI Sweden, 2023-b). Indeed, one of its main achievements is the creation of the first Nordic language model, GPT-SW3, in November 2023, in collaboration with the Research Institute of Sweden (RISE). GPT-SW3 is the first truly large-scale generative language model for the Swedish and Nordic languages, “based on same technical principles as GPT models” (AI Sweden, 2023-d). This is a very relevant development, as it will speed up considerably the implementation of AI-based systems and solutions, and in this specific case LLMs-based chatbots, for business and any type of organization. A specifically trained, and open-source, LLM for Swedish and Nordic Languages will allow any organization in Sweden to train it to its specific need and to be used by Swedish society, reaching those who don’t speak English, the main language upon which most of the main commercially available models are trained. Furthermore, it “will help Swedish organizations build language applications never before possible (AI Sweden, n.d.-b). Overall, this model will enable the development of AI-powered tools, services, and solutions tailored to the Swedish context and language, making them more accessible and relevant for the national context and population. A concrete example of this is the current development of a digital assistant for the Swedish public sector in collaboration with various municipalities across the country, which is being developed by training GPT-SW3 with data generated by employees in public organizations to improve processes and drive innovation (AI Sweden, n.d.-a). Other relevant initiatives accomplished by AI Sweden include a collaboration with Canada for AI applications in healthcare, to “accelerate AI adoption in healthcare in both countries as well as serve as a global role model on international collaboration and the positive impact of AI in healthcare” (AI Sweden, 2023c). Various actors are working together as partners in the AI Sweden network; this includes both local and international private sector actors, public organizations and agencies, and higher institutions, with civil society participation reflected by the inclusion of various municipalities across the country.

5.2.3. The Collaboration for AI in Municipalities and Civil Society

Sweden’s multi-stakeholder approach to AI governance is also reflected in its initiative and collaborative approach to engage civil society actors. ‘Kraftsamling för AI i kommuner och civilsamhälle’, or the Collaboration for AI in Municipalities and Civil Society, led by AI

Sweden and Svergies Kommuner och Regioner (SKR), brings together representatives from 12 municipalities who met seven times a year to "discuss high-level strategic recommendation on how to accelerate the use of AI in Swedish municipalities" (AI Sweden, 2023-a), with a focus on sustainable development and welfare services. Darja Isaksson, Director-General of Vinnova, emphasizes the importance of including civil society in the national AI journey: "With the help of AI, we can develop the common welfare in new ways and more efficiently address significant societal challenges" (AI Sweden, n.d.-b). Furthermore, Vinnova and AI Sweden, by recognizing that AI can serve as a tool for organizational development in all sectors of society, launched "a four-year collaboration where municipalities and civil society receive tailored assistance to understand how AI can be used and the opportunity to seek funding for concrete projects" (AI Sweden, n.d.-b). This collaboration already produced concrete results, such as the implementation of a computer vision system for monitoring road network conditions in Helsingborg, and text analysis to support social services caseworkers in Strängnäs (AI Sweden, n.d.-b). In summary, as part of the collaboration, AI Sweden provides expertise, training, workshops, and access to its large network, while Vinnova offers project funding and support during project development. The objective is to create synergies between all stakeholders, as well as between municipalities themselves, recognizing that there are many common challenges to learn from and share experiences. This is also reflected by the data from AI Sweden 2023 impact report, highlighting that 25 projects with municipalities and civil society were funded, with 12 municipalities, and more than 250 organizations involved (AI Sweden, 2023-a). Overall, all these collaborative efforts are aimed at "achieving the greatest possible impact" by involving "as many municipalities and civil society actors as possible", with the recognition that "the crucial factor is not whether AI is being used today but whether there is curiosity about how a completely new toolbox can be harnessed for [all] operations" (AI Sweden, n.d.-b).

5.2.4. AI, People & Planet

In October 2019 Sweden launched the AI, People & Planet collaborative research institute, aimed at exploring the potential of AI in accelerating innovations that contribute to achieving the SDGs. The initiative is a multi-stakeholder collaboration between national actors, including the Swedish Government, academia, and private companies (Ericsson), representatives from both U.S. public (USAID) and private (Google) sectors, and international actors such as the UN. Specifically, the initiative aims to deepen the understanding of "how AI can help expand the planetary support systems – climate stability,

biodiversity, and living oceans" (European Commission et al., 2021, p. 133) "to explore how rapid technological change AI both support and undermine transformations to sustainability" (AI, People & Planet, n.d.-a), while also addressing the challenges posed by rapid technological change for biosphere-based sustainability. This is done with a dual approach based on both innovative research and action. AI, People & Planet is already producing interesting results, with various publications and research projects, such as AI for Urban Climate Change Adaptation, and SMARTer Greener Cities (AI, People & Planet, n.d.-b), demonstrating Sweden's commitment to harnessing AI for sustainable development and the achievement of the SDGs.

5.3. Main Indicators and Evaluation

Sweden's approach to AI governance and regulation has been proactive and comprehensive, focusing from early on ensuring that AI is developed for Swedish society, people, and the planet, in a responsible, inclusive, sustainable, and beneficial way. The various initiatives and actors analyzed in the previous sections highlight Sweden's focus on AI governance and key areas such as research and development, skills and talent creation, multi-stakeholder collaboration, and sustainability. Moreover, Sweden's commitment to AI is long-lasting, being the first EU country to formally put in place a national strategy for AI. Sweden's commitment to AI can be analyzed in the country's level of AI R&D spending. In 2023 alone, Sweden has funded more than 200 MSEK, or approximately 19 million USD, in AI R&D (AI Sweden, 2023-a). Another useful metric is comparing venture capital (VC) investment in AI in the country[7]. What emerges is that while significant, Sweden's investments in AI, in absolute terms, are considerably lower than those of larger economies and key AI players such as the United States and China; in 2023, Sweden invested 1,988 million USD in AI, approximately 3.6% of the U.S.' investment of 54,836 million USD and 10.9% of China's investment of 18,271 million USD for the same year (OECD, 2024). At the same time, when comparing Sweden's AI investment to the total collective investments of the EU27 countries, Sweden's increasing involvement in the European AI context becomes more evident, with the Nordic country's investments in AI over the past three years, constituting: the 4.35% in 2021, 31.38% in 2022, and the 25.10% in 2023, of the total EU27 collective investments in the technology for each year (OECD.AI, n.) (OECD, 2024). What emerges is a lack of specific data on what percentage of Sweden's total R&D budget is specifically allocated for AI and an overall absence of standardized and specific targets for monitoring progress in AI

[7] Complete data in the annexes, Figure 7

governance. The main funding data available in English comes from governmental agencies' reports, mainly Vinnova, as well as the OECD.AI Policy Observatory. One of the main declared aims of Sweden's national strategy is developing new AI talent and expertise. AI Sweden 2023 Impact report highlights the country's growing efforts to form new AI-trained professionals and researchers. This is reflected by the increasing number of professional training programs, and by the establishment of various AI-related university programs, such as the previously mentioned examples in Uppsala and Gothenburg universities. This is a relevant indicator reflecting Sweden's long-term commitment to AI. Conversely, this dissertation shares one of the main concerns of Sweden policymakers regarding AI development and use in Swedish society, namely that, despite the efforts made since the publication of the National Approach to AI, there is still a lack of AI-trained professional, expertise, and informed users, requiring further and sustained-continued investments over time. Multi-stakeholder(ism) is a central focus of Sweden's AI governance approach, as well as of this research. The initiatives analyzed in the previous sections demonstrate Sweden's collaborative approach to AI development, use, and governance, with a high level of engagement across sectors, actors, and initiatives. Indeed, the Swedish AI governance model is characterized by the active involvement of Civil Society organizations, mainly through municipalities, which provide different perspectives and real-life applications and testing beds for new AI technologies and projects, improving the overall diffusion and awareness in the population. Furthermore, extensive public-private collaborations appear as a relevant and distinctive feature of this particular innovation ecosystem. A multi-stakeholder approach that also extends internationally, as reflected by the prominent role of Sweden as a member of the GDP, and the country's willingness to play a leading role in the emerging global AI governance regime, by setting up collaborations with various actors and at all levels, such as the partnership for AI applications in Healthcare with Canada. AI Ethics and Sustainability appear hand in hand with AI governance as an increasingly central topic in the Swedish policy debate. Various governmental policy documents and publications make clear the importance of developing AI in a responsible, ethical, sustainable, and environmentally friendly way, more importantly considering AI technologies as crucial enablers and accelerators in advancing all the SDGs (SDG 17). As discussed before, Sweden's as a strong commitment to sustainability in AI, as reflected by the country's alignment with SDG 13 and SDG target 9.5. Another quantifiable indicator in this sense is the growing number of publications related to AI and sustainability, such as the previously mentioned publications

by AI Sweden. Nonetheless, this dissertation also shares the findings of Vinnova's analysis, which suggests that the overall AI research ecosystem is currently lacking in several key areas. Indeed, when compared to similar-sized countries and research environments (Singapore, Israel, Switzerland, Australia, Finland, Denmark, Portugal, Netherlands), Sweden's position within AI research can be considered weak, particularly in terms of relatively low AI conference participation, and number of publications in both core AI and applied AI (Vinnova, 2018, pp. 101-102). As such appears evident that to properly put into action its ambitious AI strategy, Sweden must prioritize strengthening its research base and environment, both in terms of investments and cooperation. In summary, Vinnova's bibliometric analysis although highlighting a relatively weak position, also notes that Sweden, "in line with the developments that have taken place internationally" experienced, "a significant increase in [research] activity [over] the past few years" (Vinnova, 2018, p. 102). Overall, despite some areas for improvement, the analysis suggests that Sweden is making significant progress, considering AI governance as a critical policy area for the future of Swedish business and society.

5.4. A Look Through Feenberg's Lenses

Applying Feenberg's approach to the case study of AI in Sweden prompts asking many questions, among which whether all stakeholders have equal opportunities to influence the direction of technology in the country. This is a crucial point in the overall global AI landscape and emerging governance regime, where, as we have discussed, private companies are currently taking the lead in AI development, governments try to regulate but often lag behind, and civil society is left with limited agency. This is also caused by the current fast-paced technological development of AI technologies, contributing to the inability of governments to properly intervene, leaving most of the decision-making power and agency to private companies, the creators, or those with the most and proper knowledge, epistemic authority. In this situation, private companies are left with significant autonomy and power in both design choices and later auto-regulation, to fill the often-present vacuum or inadequate norms proposed by public authorities. Ultimately, this can also lead to the prevalence of the technocratic worldview and formal rationality that prioritize efficiency, productivity, and profits over broader social and ethical considerations, and to a sense of technological determinism, where users, the people, are excluded from making decisions and may feel that they have little control over the technologies that increasingly shape their lives. From that one of the main aims of this research was to ensure that Sweden is not only producing new

experts in the sector but also educating the general population about a technology that will probably increasingly shape their lives. Civil society can contribute with their own, proper knowledge and experience that may be hidden from the ones in power, but also for them to meaningfully and more impactfully participate, it is crucial to ensure that they also possess one of Feenberg's crucial prerequisites for agency in the technical domain: knowledge; and by doing so they can also preserve and enhance their autonomy. Sweden is doing so by funding training programs and promoting awareness campaigns. These actions can prevent excessive asymmetries of knowledge, hence power in shaping the direction of AI, and overall benefit the Swedish AI ecosystem, with the acknowledgment that: "It's equally important to not only focus on technical skills and talent to drive AI adoption and initiatives. AI is a cross-disciplinary field requiring skills […] in many more context-dependent skills" (AI Sweden, 2024). Overall, Sweden's approach aligns with Feenberg's call for greater public participation in technological decision-making and the inclusion of diverse voices. The establishment of initiatives like AI Sweden and the Collaboration for AI in municipalities and civil society further reflects efforts to involve citizens and social groups in shaping the direction of AI development and implementation in the country. Applying the concept of technological ambivalence, we can see the potential benefits and risks associated with AI technologies. On one side, AI has the potential to drive innovation, improve public services, and contribute to sustainability efforts. Initiatives like AI, People & Planet demonstrate an interest and potential in how AI can account for and be used for social good. On the other side, AI can also pose significant risks in terms of job displacements, privacy violations, reinforcement of social inequalities, and environmental impacts. Swedish policymakers seem aware of this duality, as reflected by their overall pragmatic approach that recognizes both the benefits and risks of AI. Of equal importance was analyzing the perspective and actions of the actors currently leading the development of AI in Sweden, as stressed before, mostly private ones, with the government acting, through Vinnova, as a central hub and facilitator for both cooperation and funding. This has revealed an AI ecosystem characterized by the presence of both big companies, but also numerous increasingly active SMEs. Through Feenberg's lens, Al Dawood's (2021) findings, or how in the absence of regulations AI organizations in Sweden tend to not apply ethical principles, can be understood as the results of operational autonomy in the hands of technical actors, leading to the disregard of the social and ethical dimensions, and posing challenges in governance and specifically accountability due to insufficient policies and regulations. This situation stresses the need to have in place clear

ethical guidelines, include such considerations throughout all the development process, and ensure the participation of all stakeholders. Sweden's emphasis on collaboration, ethical principles, and harnessing AI for societal benefit reflects a substantive rationality that goes beyond just technical considerations. All of this highlights the importance of inclusive, participatory decision-making processes that involve a wide range of actors, especially civil society. This can foster a virtuous cycle in which greater public awareness and engagement lead to a more socially responsible and accountable AI development. In this sense, training and education at all levels of the population and sectors are crucial.

Feenberg's philosophy emphasizes the potential for resistance, empowerment, and social change through engagement with technology. In Sweden's AI landscape, this potential is exemplified by the efforts to include civil society to shape the direction of AI development and governance, efforts that seem to underpin a true commitment to responsible and democratic development and implementation of technology. We can affirm that Sweden's AI strategy model has important democratic strengths, such as the emphasis on collaboration, inclusion, and ethical principles, but also presents areas for further improvement and democratization, with the ability to translate principles into enforceable practice, balancing inclusion with efficiency, and navigating possible conflicts between different stakeholders remaining ones of the main challenges.

5.5. Expectations for the Next 5 to 10 Years

Making brief period, let alone medium (5 years) and long (10 years) periods expectations is challenging given the fast (and unpredictable) developments in both AI and AI governance. As it occurred with the release of ChatGPT and of GenAI technologies in general, new sudden AI breakthroughs can trigger regulatory frenzies, and radical changes in the current AI strategies of many actors, including Sweden. Sweden, as cited before, was among the first countries, in the world, and Europe, to start to lay out a specific strategy for AI. Sweden's AI strategy has taken form over the past few years, with the creation of specific priorities, numerous initiatives, and publications, and the involvement of various actors. This has set Sweden in a good position in various areas, including extensive multi-stakeholder collaborations and the involvement of different societal actors and their experiences, as well as successful public-private collaborations. At the same time, the country's effort in assessing the state of its AI ecosystem allowed it to detect and address from early its main lacks, mainly the need for developing AI talent and expertise and strengthening the Swedish AI research landscape. Similarly, it also allowed Sweden to be aware of the possible risks, including the

previously cited risk for personal data, and to take action to address them, with the use of the GDPR framework and new ethical and security focus considerations. Now the country is tasked with active monitoring, implementation, and when needed, iteration of its approach and actions, to keep up with the developments in AI and its governance. In other words, this dissertation recognizes the need for Sweden to keep adopting the same pragmatic, cooperative, and policy-oriented approach, and to continue to evolve it as AI evolves too. Specifically, multi-stakeholder cooperation appears as a key factor and feature of the Swedish approach to AI governance; we can expect that the number of new partnerships and cooperation will rise over the next years, to include more and more civil society actors, such as municipalities. The same can be expected for an increase in the general investments and funding for AI R&D and new projects. Overall, Sweden's public sector has the potential to use its extensive amount of quality public data to create concrete applications to improve the welfare, competitiveness, and daily life of its society; the previously mentioned ongoing project to create a digital AI assistant for Sweden's public administration built on top of GPT-SW3 is a very promising example in this sense. Indeed, the launch of GPT-SW3, the first large language model in Swedish, holds the potential to bring new innovative GenAI applications into Swedish society and could be expected to overall bring the population closer, in terms of knowledge and awareness, to AI. Sweden's collaborative approach, as we have seen, also extends internationally. The very active role played by Sweden in the UN, with numerous international partnerships with various actors and sectors, is positioning the country as a key player, capable of influencing the emerging global AI regime either through collaborative efforts or by using its experience and expertise to shape the future the direction of it, as seen by the creation of the Zero Draft. Sweden is also gaining an increasingly prominent role in the EU AI context, and it is expected to continue to do so in the following years. We can expect that the country will continue to align parts of its policy and strategy to EU frameworks, particularly in terms of individual rights protections, as seen currently with the use of the GDPR, and soon with the recently approved EU AI Act, which is expected to significantly influence the development of Swedish approach and strategy to AI governance. Similarly, we can also expect that global developments in the emerging AI governance regime will influence the direction of Sweden's AI governance, particularly the role of the UN, which is already shaping Swedish's strategy as seen by the strong focus and link between AI and the SDGs. This could have significant implications for the future, with Sweden being a positive example of alignment with the SDGs, and in a good position to

serve as a testing ground for innovative AI applications for the SDGs, particularly for goal 13 (Climate Action). We can imagine a long-term possible scenario in Sweden where a human-centric AI is a key enabler and accelerator for societal and planetary good. In other words, a scenario where AI is used for the good, daily life of citizens and the planet, and to create sustainable solutions to pressing societal problems. On the other hand, if risks are kept unmanaged, and unaddressed, we can expect potential issues for personal rights, as well as bad results from AI race on the environment. In summary, although formulating clear expectations and predictions can be challenging, we can identify four key factors that will surely influence the future of AI and AI governance in Sweden, namely the ability of Sweden, particularly the Government, to continue pursuing its (democratic) strategy while addressing its issues; the general pace of AI development and adoption; the global and EU contexts and competition; the Swedish public opinion and engagement with AI.

6. Recommendations

6.1. Recommendations for Sweden AI Governance

1. Strengthen AI R&D: significantly increase public funding, focusing on areas that advance both innovation and sustainability (such as climate change mitigation and healthcare). Increase research funding for responsible and ethical AI and AI safety to reach at least 30% of the total national R&D spending, also maintaining or increasing the current level of 25% of the total combined EU27 spending in AI.
2. Invest in AI expertise and talent development: as reflected by AI national strategy, create new AI expertise and talent by creating new university programs to both form new local experts and attract global talents. Specifically, increase the number of active AI-related university programs by 50% and aim to double the number of AI PhD candidates within the next 5 years. Create and fund specific AI programs in the social sciences to broaden the scope of the research.
3. Increase public awareness and engagement: through awareness campaigns and educational initiatives on AI issues, ethics, governance, and personal rights. Start developing mechanisms for public consultation in decision-making processes.
4. Empower cities and municipalities: and encourage them to take a more active role. Municipalities can act as key players and bridges for AI technologies to reach the general population. Increase the number of municipalities involved and the funding of projects involving AI applications in cities. Establish a national fund to support municipalities in developing and implementing AI projects within the next 5 years.

5. Adopting indicators: to assess progress in AI governance, such as a common national database of initiatives, and make relevant data and policy documents more accessible by making them always available in English, to improve international collaboration, research, and information sharing.

6.2. Recommendations for the emerging global AI governance regime

1. Develop a global mechanism for AI governance: that can ensure inclusivity, transparency, accountability, and cooperation of members, and can develop international standards and best practices for AI development, use, and governance. Establish an independent global AI governance council with representatives from diverse companies and sectors, to develop and oversee the implementation of international standards and best practices.
2. Avoid AI fragmentation and zero-sum races: by fostering international cooperation, dialogue, and information and technology sharing to prevent the emergence of AI governance fragmentation (splinternet) (Schmitt, 2022, p. 307). Discourage AI development races that prioritize speed, profits, and competition over safety and responsible development, which could put at risk personal rights and environmental considerations, by creating comprehensive rights and regulations for digital subjects and societies at large regarding AI.
3. Ensure Inclusive AI governance: ensure the inclusion of all stakeholders, especially civil society and marginalized and underrepresented communities in tech and AI governance. Ensure that benefits are equitably distributed, and that AI is governed for the shared world, such as by ensuring environmental considerations are included. Avoid the risk that the implementation of AI technologies widens the already existing digital and knowledge gap between many countries, and so put in place cooperation mechanisms, at the UN level, to promote AI knowledge sharing and capacity building. Creates a Global AI Inclusion Fund to support the capacity building and participation of all countries and relevant stakeholders in AI governance processes, providing funding, expertise, and assistance.

7. Conclusions

As AI technologies continue to advance and increasingly permeate various aspects of society, the need for effective and responsible AI governance becomes even more pressing. The global analysis has depicted a fragmented and evolving AI global governance regime, with various international organizations, governments, private entities, NGOs, and initiatives influencing the course of AI and AI governance around the world. The OECD is taking a leading role, at least normatively, while the UN is very active in promoting sustainability and collaboration between different stakeholders. All these global actors and initiatives point out that AI is already having considerable impacts all around the world, thus a need to develop and deploy effective and inclusive governance mechanisms to ensure AI technologies are developed and deployed in a responsible, sustainable, and secure way, for both the people and the planet. Specifically, the need for multi-stakeholder collaborations is perfectly reflected by the increasing importance of effective initiatives like GPAI and PAI. Sweden emerges as a compelling case study example for (responsible and democratic) AI governance. Sweden's approach has been proactive and comprehensive, focusing on ensuring that AI is managed in an inclusive, sustainable, and beneficial way. Sweden’s national strategy has focused from early on assessing the current state of its AI ecosystem, as well as on the possible impacts, benefits, and challenges of implementing AI technologies in its business and society. This extensive evaluation work has enabled Swedish policymakers to gain, in advance, knowledge to develop a comprehensive and pragmatic AI strategy, conscious of the country’s strengths and weaknesses, also ensuring to keep the focus on sustainability and multi-stakeholder engagement. In practice, this allowed Sweden to put in place, mainly via its governmental agencies (Vinnova), numerous AI-related investments and initiatives. Initiatives like AI, People & Planet, the Collaboration for AI in Municipalities and Civil Society, and the release of GPT-SW3, are only some of the main examples of the results of Sweden’s efforts. Conversely, there are also significant areas for improvement in Sweden’s AI ecosystem, namely further developing new AI talent and expertise; widening the national research base on AI; create more instruments to methodically assess progress in AI and AI governance. All these factors put Sweden in a good position to be a leader, an example of AI governance in the EU context and around the world, as well as a potential testing ground for innovative AI applications, particularly in the public sector. Others can learn from Sweden’s example to align their AI strategies to responsible and collaborative development and sustainability (SDGs). Nonetheless, it is also important to acknowledge that “the cross-border nature of the

[AI] digital ecosystem renders purely national regulatory regimes inefficient and costly. Hence big parts of the discussion around ethical AI and AI governance" (Schmitt, 2022, p. 304) should draw insights from specific national approaches like Sweden, but mainly should focus on the international level. In other words, a need to establish frameworks, best practices, and standards at the global level.

This dissertation aimed to analyze the main actors and initiatives in the emerging AI governance regime, both globally and in Sweden, and to offer information and recommendations to policymakers to strengthen their AI strategies. Further research can depart from this analysis and analyze the impact of the recently approved EU AI Act on Sweden, or by critically examining how the concept of multi-stakeholder(ism) is being truly enacted and performed (Hofmann, 2016) in these and future AI governance initiatives. Specifically, there is a concrete risk that in the actual AI regulatory frenzy, many multi-stakeholder initiatives may emerge, but only be pursued as merely performative acts, without truly embodying and enacting the principles of inclusivity, diversity, and bottom-up participation of multi-stakeholder governance models. What emerges from the study of Sweden's approach to AI governance is that the country appears to have a true commitment to multi-stakeholder(ism) beyond just performativity, in a democratic approach that is already producing tangible results in promoting responsible, sustainable, and innovative AI technologies and applications.

In conclusion, we need to ensure that the technology is developed responsibly, prioritizing not only the potential of this technology for the present, but also its possible negative implications for the future, and more importantly for the benefit of all. A true democratization of technology needs to involve the engagement of not only the academic community, government, and private sector, but also of civil society: multi-stakeholder(ism) to make sure different standpoints are included, and human-centric, inclusive, and ethical approaches adopted. The stakes could hardly be higher, as the choices we make about AI today will (and are already) profoundly impact the future of our societies and planet.

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9. Annexes

9.1. On the Use of AI Software in this Dissertation

As discussed in the methodology section, various AI tools were employed to support the research process. This was done firstly by directly adhering to UPF academic regulations, and secondly by also indirectly following the recommendations on ethical and recommended use of AI employed at Gothenburg and Chalmers Universities. When I did use any direct output from the AI, such as in the methodology section, I clearly cited it as such, treating it as any other reference: (name of the model, year), with the awareness of two of the main risks associated with their use, namely hallucinations and incorrect citations.

This additional declaration is done with the belief that as AI will be increasingly integrated with education and research, this will need changes, requiring reconsidering ethical and academic principles, creating specific learning activities to educate people, and balancing between existing and much needed new regulations. This will also include the need to clearly disclose and explain the use of (Gen)AI in research, and especially of generated outputs, to account for integrity and replicability.

9.1.1. Figure 1.

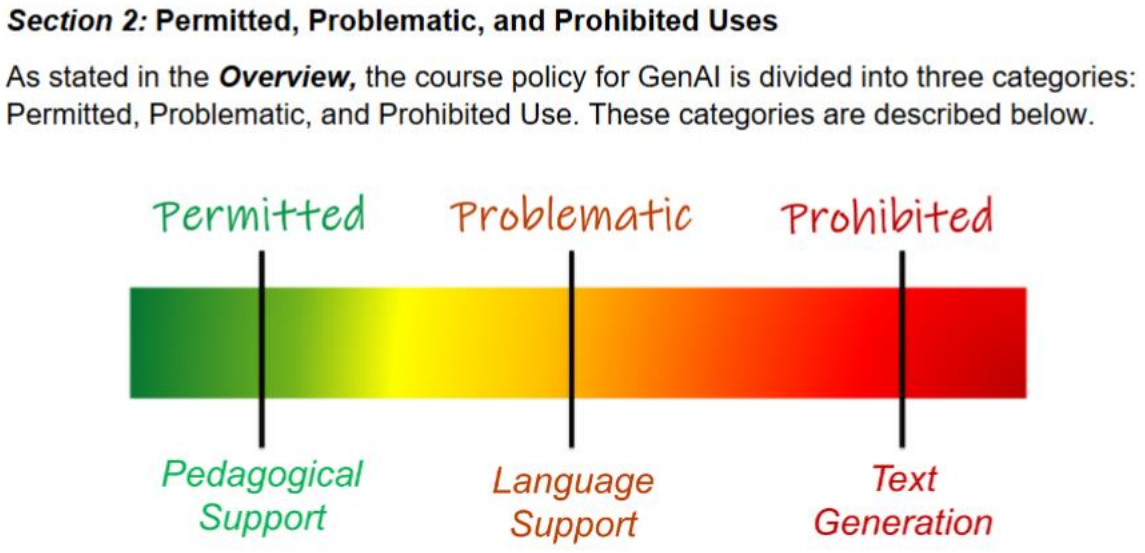


Image showing a possible categorization of the possible uses of AI in education (Olsson, 2024).

9.1.2. Figure 2.

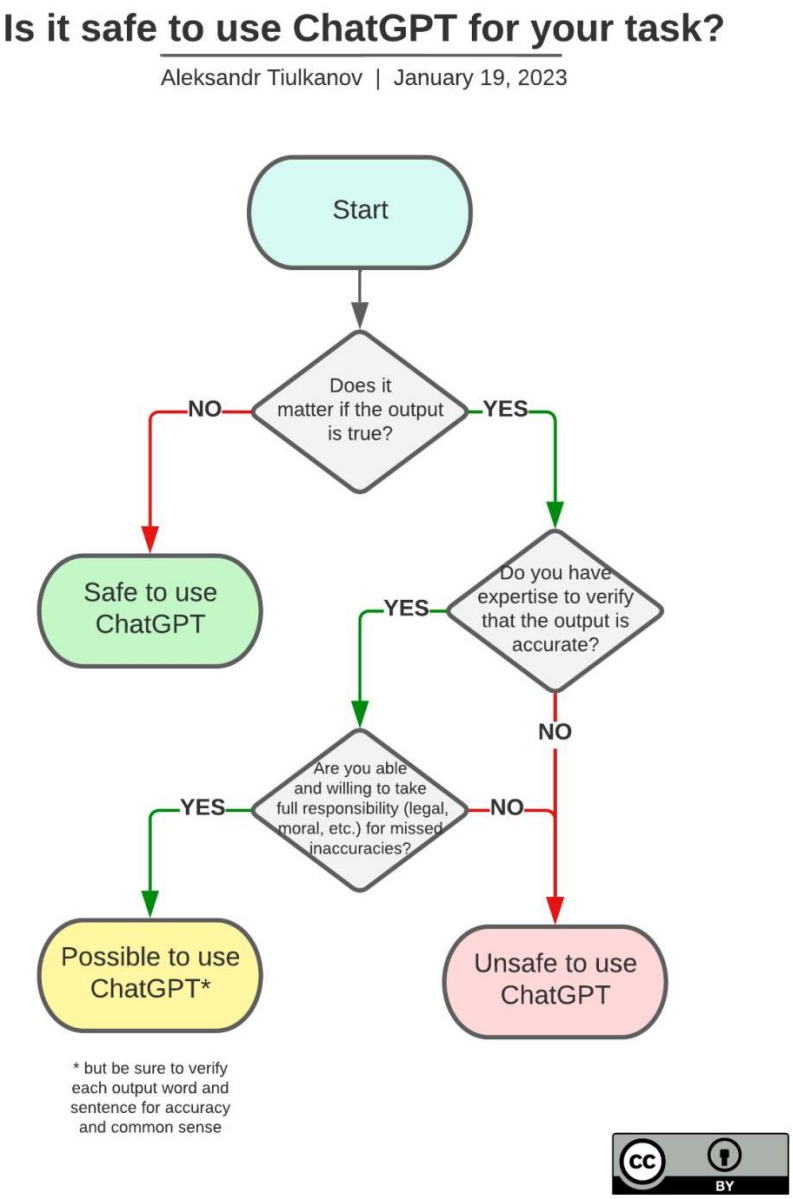


Diagram showing the safe use and unsafe use of GenAI writing tools (Granström, 2024)

9.2. Examples of prompt used

Here is a list of some examples of the prompt used to use and interact with the various AI models:

- “Please assume the role of a (university professor, tutor, etc.) specializing in (topic) and explain (topic).”
- "Have a conversation with me as a (role) and help me understand (topic or text)."
- "Explain (concept, event, etc.) using the theoretical lenses of (insert theory or author)."
- "How would (author) explain (topic or event)?"
- "What are the most relevant ideas of (insert author, thinker, writer) that can be used to analyze (case study)?"
- "Starting from the question of (question), engage me in an iterative process to learn..."
- "Define (term) in the context of (field or discipline)."
- "Explain (complex idea) in simpler terms."
- "Provide a step-by-step guide on how to (task, research process, …)."
- "Summarize the main points of (text or article) and offer a critical analysis from the perspective of (theoretical framework)."
- "Compare and contrast (concept 1) and (concept 2) in the context of (insert field or topic)."
- "Analyze (text) from a (theory) perspective."
- “Examine the (document) through the lens of (theory, author, perspective).”
- “Summarize the main (ideas, controversies, hypotheses, …) in this (text, author, theory).”

9.3. The Governance Triangle

9.3.1. Figure 3.

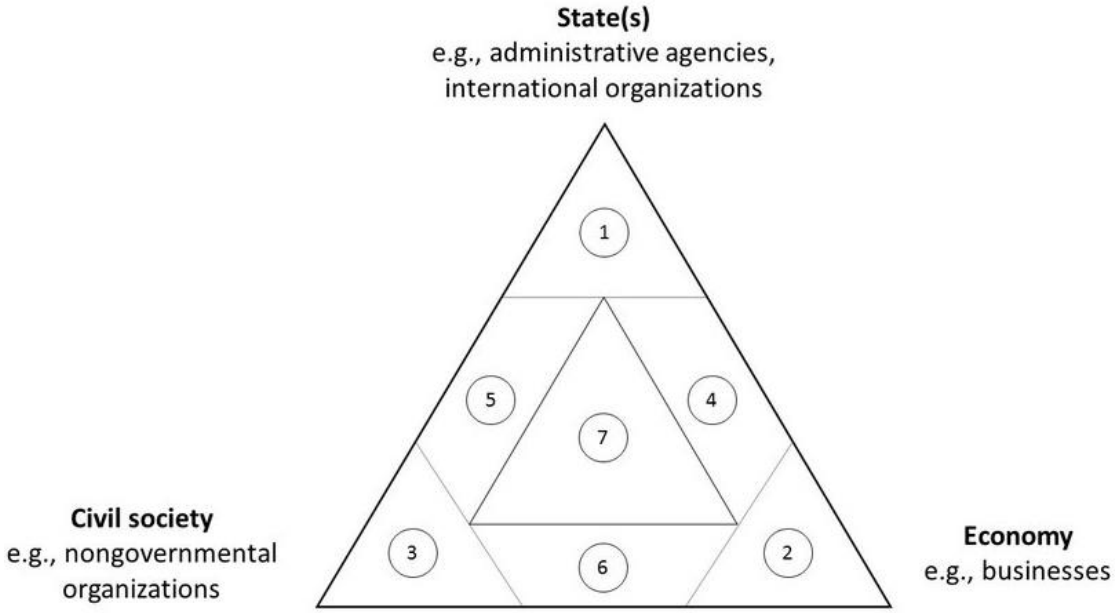
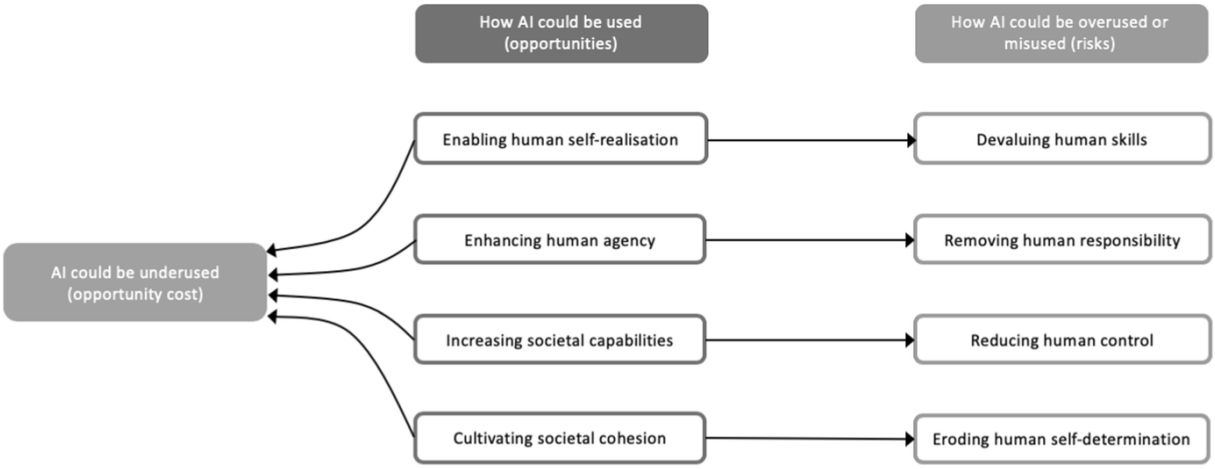


Image depicting the governance triangle as conceptualized by Abbott and Sindal (ResearchGate, n.d.).

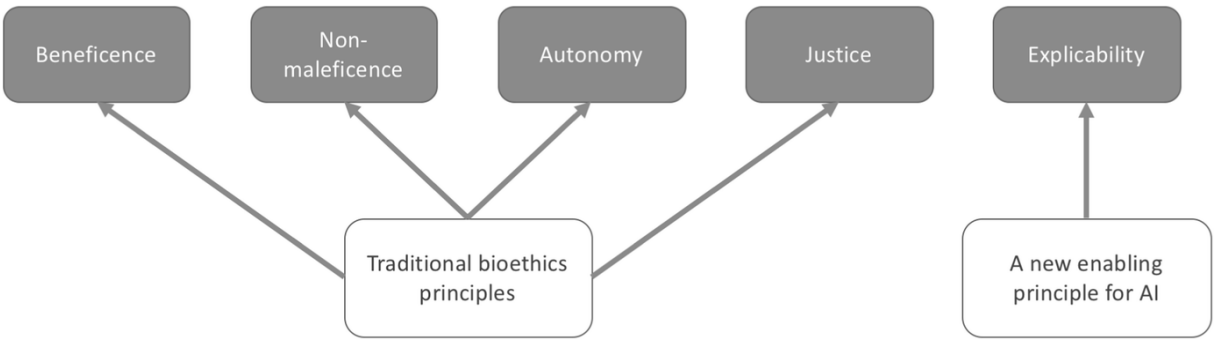
9.4. Floridi et al. ethical framework for a good AI society

9.4.1. Figure 4.



Overview of the four core opportunities offered by AI, four corresponding risks, and the opportunity cost of underusing AI (Floridi et al., 2018, p. 700).

9.4.2. Figure 5.



An ethical framework for AI, formed of four traditional principles and a new one (Floridi et al., 2018, p. 691).

9.5. Overview of national AI strategies in the EU Member States and Norway

9.5.1. Figure 6.

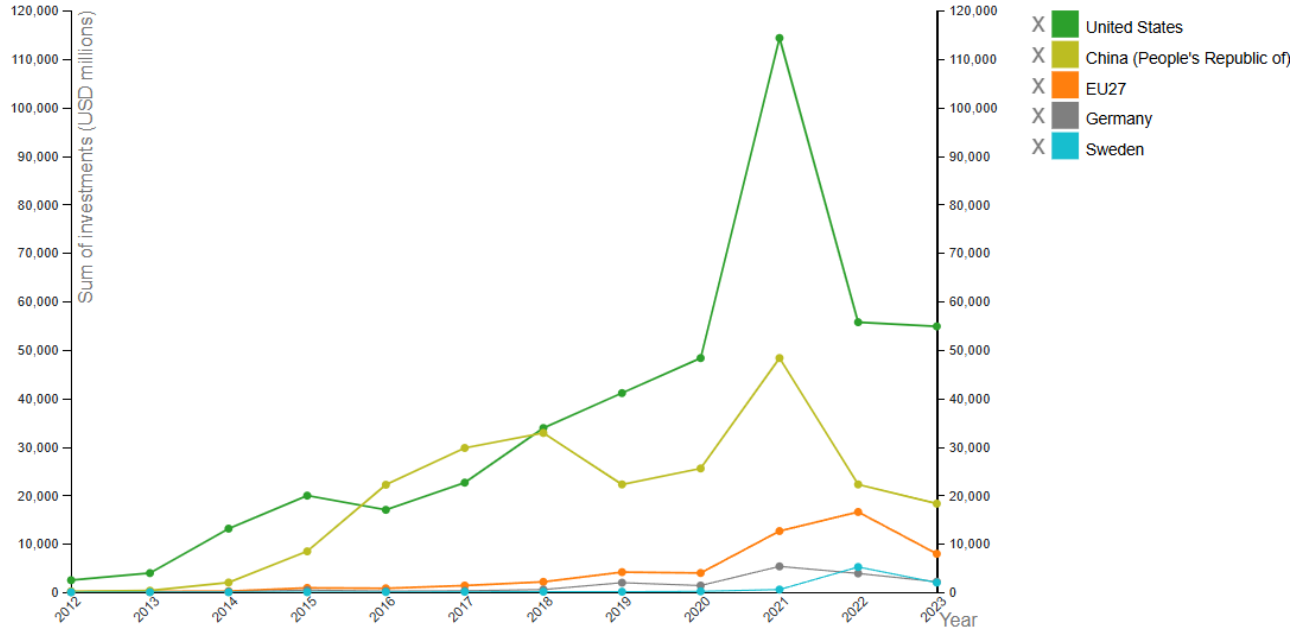
Country	Status	Date
Austria	In progress	
Belgium	In progress	
Bulgaria	Published	Dec. 2020
Croatia	In progress	
Cyprus	Published Last update	Jan. 2020 Jun. 2020
Czech Republic	Published	May 2019
Denmark	Published	Mar. 2019
Estonia	Published	Jul. 2019
Finland	Published Last update	Oct. 2017 Nov. 2020
France	Published	Mar. 2018
Germany	Published Last update	Nov. 2018 Dec. 2020
Greece	In progress	
Hungary	Published	Sept. 2020
Ireland	In progress	

Country	Status	Date
Italy	In progress	
Latvia	Published	Feb. 2020
Lithuania	Published	Mar. 2019
Luxembourg	Published	May 2019
Malta	Published	Oct. 2019
Netherlands	Published	Oct. 2019
Norway [AC]	Published	Jan. 2020
Poland	Published	Dec. 2020
Portugal	Published	Jun. 2019
Romania	In progress	
Slovakia	Published	Jul. 2019
Slovenia	Published	May 2021
Spain	Published	Dec. 2020
Sweden	Published	May 2018

A table showing how Sweden was the first country to develop a national AI strategy (European Commission et al., 2021, p. 8)

9.6. AI funding in Sweden: VC investments in AI by country

9.6.1. Figure 7.



Sweden's VC investment in AI from 2012 (in blue) (OECD, 2024).