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CONCEPTUAL PAPER

Governance of AI for a Sustainable Future

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ABSTRACT

PURPOSE: The purpose of this paper is to explore the intersection of artificial intelligence (AI) and the UN's Sustainable Development Goals (SDGs) through appropriate self-governance configurations at the firm, alliance and industry levels.

DESIGN: This is predominantly a conceptual paper that develops theory and proposes avenues for necessary additional research on this very timely topic.

RESEARCH LIMITATIONS: Limitations are inherent in the extremely rapid development of AI, resulting in ever-changing issues and challenges facing those implemented AI solutions.

FINDINGS: We build on research on environmental sustainability and propose that organisations that adopt voluntary self-regulation have an early mover advantage, not only in developing capabilities to effectively respond to upcoming regulation, but also by providing critical input in the regulatory frameworks.

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ORIGINALITY: We develop a conceptual framework for responding to the challenges of AI to environmental, economic and societal issues, by focusing on governance mechanisms that can moderate this relationship. We further integrate existing knowledge on self-regulation and propose solutions to the response speed problem. The paper is timely, as society is currently grappling with large questions on how to manage the diffusion of AI. We believe that governance plays a key role in these debates.

IMPLICATIONS: Governance and regulation are essential in optimising the relationship between AI and SDG outcomes. It is documented that AI can be incredibly helpful, yet potentially perilous to societies and the environment.

KEYWORDS: *Artificial Intelligence; SDGs; Governance; Ethics*

INTRODUCTION

The rapid development of various forms of artificial intelligence (AI) is a global phenomenon. The term AI includes a variety of definitions. Chhillar and Agueilera's (2022) article in *Business and Society* cites 15 different definitions of AI from a selection of recent academic articles. Regardless of how one defines AI, as a variation of technology, a system, or an algorithm, the world appears enamored with the concept.

With the increased attention and popularity of AI, the number of academic conferences and journal submissions related to and focused on AI is increasing. Notably, a 2020 article in *Nature* was based on the early efforts of 10 multi-disciplinary researchers from across the world, relating AI to achieving the United Nations's (UN) 17 Sustainable Development Goals. This ambitious project used expert-driven literature searches to identify connections between AI and SDGs (Vinuesa *et al.*, 2020). The UN's 2030 SDGs were adopted by 193 countries in 2015. The 17 SDGs with their 169 targets cover a range of environmental, social, and economic areas, all of which are designed to make the world a better, sustainable place for all peoples. The goals are said to provide understandable guidance to governments, organisations, and businesses in their ways to improve life on our planet for everyone.

Overall, the *Nature* study (Vinuesa *et al.*, 2020) found that AI has the potential to positively impact 134 SDG targets (79%); they also cautioned that 59 targets (35%) may be negatively impacted by AI. Table 1 shows the relationships this article identified as major issues for AI applications and SDGs related to the environment, economy, and society.

Table 1: Potential Issues in AI Achieving UN Development Goals

Issue	Issue Category
Less access to AI from low- and middle-income countries increases inequality	Economic
Automation replacing jobs creates unemployment and higher wealth concentration for business owners	
High energy consumption for AI computing centres	Environment
AI can continue societal bias from human generated datasets leading to inequality	Society
AI can increase surveillance and tracking of citizens, limiting freedom and human rights	
Big nudging to exploit cognition bias that damages human rights and democracy	
Mass individual data collection from AI creates data privacy and cyber security risk	
Concentrated corporate ownership of AI technology can lead to only focusing on profitable applications that may ignore UN development goals	

Source: Adapted from Vinuesa *et al*., 2020

Acemoglu and Restrepo (2018) concluded that businesses would benefit from the use of AI technologies mainly through increased productivity. However, the *Nature* study reported that greater inequalities may be the result of productivity increases. Access to AI technologies and expertise in use are not distributed equally among nations, which will likely lead to increasing inequality. "Automation", the article reports also, "shifts corporate income to those who own companies from those who work there". To overcome some of the possible negative impacts of AI, Dalenberg (2018) and Saam and Harrer (1999) suggested AI could possibly identify sources of bias, inequality, and conflict.

Businesses are particularly important to achieving SDGs. At the forefront of these efforts are the over 12,000 businesses in over 160 countries that have joined the UN Global Compact—the world's largest corporate sustainability initiative. The ten principles of this organisation are not directly related to AI, but address the fundamental responsibilities of businesses to include principles related to human rights and labour. These are appropriate to be considered and evaluated by firms in the implementation of AI in business activities.

A large number of firms are engaged in developing and implementing AI in a variety of ways. Investors are also eager to back the next big thing in artificial

intelligence, even where firms have no business plan or ideas on how to monetise it. The sudden influx of capital is also encouraging many AI researchers, some without management or operations experience, to start their own companies (Seetharaman and Jin, 2023). It will be very important that firms beginning to use AI keep the technology connected to humanity. "At the very least, that would assure that real humans are responsible and accountable for what the machines do" (Isaacson, 2023).

LITERATURE REVIEW

AI Regulation Challenges and the Need for Governance

Even though AI offers an incredible capacity to create new progress towards the UN's SDGs, the simultaneous potential for peril requires systematic governance to guide this technology to a positive outcome. As such, a multitude of academics and industry experts have called for the governance and regulation of AI (Chhillar and Aguilera, 2022; Davis *et al.*, 2022; Papagiannidis *et al.*, 2023). A common theme in this discourse is a call for national governments around the world to create new policy that regulates AI practices. Government policy can extend a strong hand towards AI governance, as government institutions have the power to punitively enforce regulations on the development and deployment of AI practices. It is therefore understandable why many stakeholders are turning to the world's governments to respond to rapidly developing AI.

However, there are genuine concerns about relying on government action to govern AI. First, AI is advancing at an incredible rate, creating urgency for governance in the near term. Governments often struggle to respond to issues related to technological changes as the complex nature of technology has proven difficult for governments to comprehend well enough to create effective policy (Moses, 2007). As such, technology regulating policy is often delayed for years, and may not be effective when it is created. For example, digital copyright infringement was a major issue for years before the US passed the Digital Millennium Copyright Act (DMCA) to update outdated copyright laws to address digital piracy. However, when the DMCA was passed, it proved largely ineffective as technical workarounds were quickly created that circumnavigated the regulation's enforcement mechanisms (Boyden, 2013). Given the extreme complexities and quick evolution of AI, it is probable that many governments will struggle in understanding the technology well enough to create effective policy.

Second, for AI to reach its potential in improving SDGs, it will need to access and analyse data from many nations in multiple jurisdictions. As such, government regulation is likely to be fragmented with regions and countries adopting varying

types of regulation at different times (Davis *et al.*, 2022). Therefore, even if one nation's government can create effective regulation in a relatively short time, the national regulation's overall governance effectiveness may be limited as firms deploying AI technology could be operating in a nonregulated jurisdiction. For example, in April 2023, Italy banned OpenAi's ChatGPT, the leading natural language AI, claiming concerns about how ChatGPT collected users' data and for failing to protect children from accessing inappropriate material in the AI. The ban lasted for one month and ChatGPT was allowed to operate in Italy once again after OpenAI updated information on its website about it how it collects and uses user data, provided EU users with a new form for removing their data from further ChatGPT training, and added a user age verification tool (Chan, 2023). While these actions were effective in getting OpenAI to change some activities, ChatGPT continued to be used outside of Italy during this time. Therefore, nations will need to co-ordinate to create effective regulations for AI, yet policy co-ordination between countries is often challenging.

There are real challenges for the governments of the world to create expedient effective unified regulations. As such, we propose that market-based governance may be a better option for near-term AI governance. Market-based governance can be implemented by the firms that are creating and controlling AI. These firms have the technical ability to understand AI well enough to implement effective governance quickly. Additionally, as firms are the ones who primarily own AI, successful market-based governance can be effective in all jurisdictions in which the firms operate. In the following sections, we review three types of market-based governance at the levels of firms, social alliances, and industry.

Firm Level Governance

Corporate governance at the firm level has been subject to extensive examination and debate in academic and practical circles alike, with a primary focus on how it can shape the trajectory of organisations by influencing their decision-making processes, risk management strategies, and stakeholder relationships. In the realm of strategic management, a multitude of studies highlight the role of the boards of directors as one of the key governance mechanisms, pivotal in steering the firm's response to external opportunities and threats (Finkelstein and Mooney, 2003; Zahra and Pearce, 1989). Other significant corporate governance components include executive compensation and shareholder activism, each with distinct implications on a firm's strategy (Bebchuk and Fried, 2004; Gompers *et al*., 2003).

When discussing the mechanisms through which firms deal with external opportunities and threats, a prominent area of research is the firm's absorptive capacity (Cohen and Levinthal, 1990), the ability of a firm to identify, assimilate, transform, and apply valuable external knowledge. This concept is crucial when considering how governance practices and strategies allow firms to navigate dynamic environments. Further, studies also suggest that firms with robust governance structures are more likely to proactively respond to threats and opportunities in the external environment, underscoring the interplay between corporate governance and strategic change (Hill and Jones, 1992). The literature thus points to the centrality of firm-level corporate governance in enabling businesses to effectively leverage external opportunities and manage potential risks, a theme that holds relevance for academics and practitioners alike.

Social Alliances

Social alliances are seen as long-term, mutually beneficial organisational collaborations that involve different entities working together towards a higher social goal (Drumwright, 1994; Liu and Ko, 2011). Organisations are motivated to enter partnerships to address social and environmental challenges for a variety of reasons (Weerawardena and Mort, 2012). Ultimately, co-operative agreements help organisations by expanding their network and enlarging their outreach and ability to achieve a long-term impact. Many alliances form because firms or non-profits are motivated by the benefits they can leverage, such as financial capital, complementary resources, know-how, and needed skills (Knox and Gruar, 2007; Liu and Ko, 2011; Kerlin and Pollak, 2011; Vock *et al.*, 2013).

In responding to external opportunities and threats, various mechanisms have been identified. Eisenhardt and Schoonhoven (1996) argue that the speed of strategic decisions and the flexibility of processes play a significant role in the effective execution of alliances. Moreover, the work of Khanna *et al*. (1998) indicates that alliance networks, being a distinct form of governance, allow firms to rapidly adjust and respond to external conditions. Still, it is important to note that Child and Faulkner (1998) have underlined the essential role of trust and mutual understanding between alliance partners in successfully managing external influences.

Industry Self-Regulation

The third level of market-based governance to review is industry self-regulation, the voluntary actions firms take to govern their industry (King and Lenox, 2000).

In practice, industry self-regulation often results in the creation of an industry standard that aims to govern firms within an industry to ensure standard practices and policies on a given issue. An example of industry self-regulation is the chemical industry's Responsible Care programme; this programme created procedures, practices, and policies for firms to adopt that promote improved handling of chemicals to increase safety and decrease environmental impact (King and Lenox, 2000). Another example is Canada's Oil Sands Innovation Alliance that self-regulates the Canadian oil sands industry to minimise the environmental impact of oil sand extraction (Bowen *et al*., 2018).

Industry self-regulation research has largely focused on environmental issues relating to firms and managing common-pool resources (Bowen *et al.*, 2018; King and Lenox, 2000). However, not all industry self-regulation revolves around the environment or resources. For example, industry self-regulation has been shown to be more effective in getting firms to admit to wrongdoing by issuing corrected corporate earnings when compared to bureaucratic and legal action taken against firms (Pfarrer *et al.*, 2008). Given that industry self-regulation has created broadly adopted governance structures in multiple industries, there is potential for industry self-regulation to be an effective governance mechanism for sustainable AI.

Conceptual Governance AI Model

Although AI governance presents challenges in its technical complexity and quick evolution, these challenges are not entirely unique. Recent developments in social media governance, specifically the Oversight Board for Meta's Facebook and Instagram, provide an emerging governance configuration that holds promise for AI governance. In this section, we review the Facebook Oversight Board, then introduce a conceptual model that illustrates how an independent oversight board for AI can be created at the firm level, used to form a social alliance, followed by industry self-regulation governance structures.

Emergence Governance Configuration: The Oversight Board

The Oversight Board was created in 2018 to advise Meta (then Facebook) on issues related to free speech, online safety, and freedom of expression on the company's social media platforms. The creation of the Oversight Board was prompted by the public recognition of Facebook's role in influencing its users during the 2016 presidential election with the Cambridge Analytical scandal, and other issues with free speech and misinformation on the platform. In the wake of these issues, Facebook's stakeholders pressured Facebook to increase transparency on how Facebook moderates

its content and makes decisions on free speech, and to create an independent external review process for users affected by Facebook's content moderation, removal of content, and banning of accounts to have a means for a meaningful and timely appeal (Klonick, 2020). The outcome of this stakeholder pressure was a new form of firm self-governance in the form of the Oversight Board, whose purpose is to "promote free expression by making principled, independent decisions regarding content on Facebook and Instagram and by issuing recommendations on the relevant Facebook company content policy" (Oversight Board, 2023).

The Oversight Board was intentionally designed to navigate the challenges in governing Meta. First, the Oversight Board is comprised of culturally and professionally diverse members who combine their expertise and perspective to deliberate and make decisions. Members bring professional expertise from journalism, digital rights non-profits, think tanks, universities, and court systems, and include multiple legal scholars and a Noble Peace Prize Laureate. Further, members bring a variety of cultural experiences and represent countries from six continents. This highly knowledgeable and diverse board composition allows the Oversight Board to navigate the technical, legal, political, and socio-cultural complexities of free expression on Meta's platforms. Further, the Board was designed to operate independently of Meta. The Oversight Board has full authority in governing itself, and member recruitment and selection.

The Oversight Board is a unique governance structure. Of course, it is not an absolute governance solution, as Meta still can override the Oversight Board in cases of exceptional circumstances (Klonick, 2020). However, the Board's rulings are meant to be binding; it provides policy recommendations to Meta that Meta analyses and then publicly communicates whether or not to adopt the policy. Therefore, for a powerful firm with incredible control over social media, the Oversight Board's composition of diverse experts, independence, and increased transparency offers a meaningful governance structure. Hence, a similarly structured independent oversight board has the potential to create a useful governance structure for sustainable AI.

Independent Oversight Board and Sustainable AI

An independent oversight board has the potential to create market-based governance structures for sustainable AI. Conceptually, a market-based governance structure process would utilise an independent oversight board. The board should be created at the firm level, then developed into a broader social alliance governance structure, and eventually evolved into industry self-regulation. Figure 1 depicts the AI market-based governance process, delineated by formation complexity and implementation time.

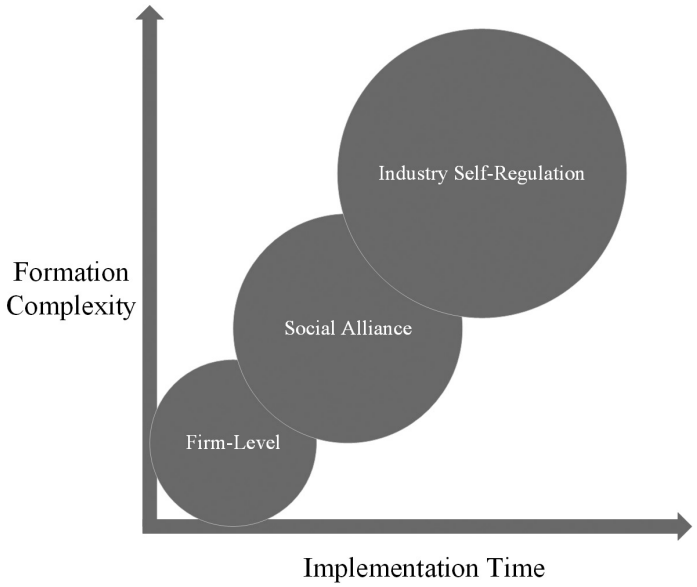

Figure 1: Sustainable AI Market-Based Governance Process
Source: Constructed by authors

Firm Level Creation

The idea of governance AI technology at the firm level allows for a more tailored and agile response to the unique circumstances and needs of organisations, considering that each firm utilises AI in different ways and to varying extents. As such, firm-level governance of AI can enhance the alignment between AI use and the organisation's specific strategic goals. Companies can integrate AI ethics and policies into their broader strategic planning, ensuring that AI use aligns with and contributes to the firm's mission and objectives. This close alignment can enable more efficient resource allocation and provide a competitive edge to firms that can strategically deploy AI.

Second, firm-level governance can provide greater agility and adaptability. Given the rapid pace of AI advancements, firms can swiftly respond to changes in technology by adapting their internal policies and guidelines as needed. They are not constrained by the typically slower pace of change in industry-wide or governmental regulations.

Third, firm-level governance can create a sense of ownership and accountability, fostering a stronger AI ethics culture within an organisation. Firms can establish internal accountability mechanisms that ensure AI technologies are used responsibly

and ethically, boosting employee confidence in the technology, and enhancing their engagement.

However, this does not imply that firm-level governance should replace industry self-regulatory bodies or government regulation. Those larger-scale efforts provide important standards and benchmarks, and play a crucial role in addressing broader societal impacts and risks of AI. In the best scenario, firm-level governance would complement and reinforce these broader efforts, leading to a more comprehensive and effective overall governance of AI technologies.

Social Alliance Expansion

The governance of AI technologies as part of a social alliance, rather than solely by a company or the rule of law, is an innovative and potentially impactful concept. Such an arrangement recognises that AI's effects permeate beyond the confines of the firms that develop these technologies, impacting the broader society and environment in myriad ways.

One of the potential benefits of this governance model is the diversification of viewpoints and input. As argued by Brundage and Bryson (2016), due to their transformative potential, AI technologies should not be governed solely by their creators or existing law structures that might not fully comprehend the nuanced implications. Engaging various stakeholders in a social alliance, including academia, civil society, users, and policy-makers, would ensure a more democratic and holistic approach to AI governance. This arrangement could potentially lead to more equitable and socially beneficial outcomes, as different perspectives and interests are taken into account.

Further, adopting a social alliance model for AI governance could enhance trust and transparency. A social alliance-based governance could mitigate accountability issues by fostering a culture of open dialogue, scrutiny, and shared responsibility. Moreover, it could serve as a platform for identifying and addressing potential societal threats and opportunities arising from AI, thereby contributing to more robust risk management and proactive strategy development.

Finally, a social alliance model for AI governance aligns with the increasingly interconnected nature of our world, where challenges and opportunities do not respect organisational or national boundaries. AI is a global phenomenon, and its governance should reflect this reality. A social alliance for AI governance would enable better co-ordination and harmonisation of standards and practices across borders, enhancing the global management of AI technologies and their effects.

Establishing Industry Self-Regulation

As the independent oversight board evolves from a single firm to a social alliance, the potential exists to scale the practices and standards the board has created industry-wide. Industry self-regulation generally forms through a central organisation that understands and responds to shared problems facing the industry (Barnett, 2013). As the independent oversight board would be created by a leading AI firm and then coalesced around a social alliance of multiple leading AI firms, the board would have a comprehensive understanding of the issues facing the AI industry. Therefore, the board would be in a strong position to create the best practices and standards that can apply to multiple industry participants, ranging from other large firms scaling AI projects to smaller firms entering the industry. Industry self-regulation could address many of the AI-driven issues for the UN's SDGs for a broad selection of industry participants.

While the independent oversight board contains the capabilities to establish the practices and standards needed for industry self-regulation, a major challenge will be convincing other industry participants that are not part of the social alliance to voluntarily adopt those standards and practices. As such, the independent oversight board may need to create a new trade association organisation to attract more industry participants. The purpose of trade associations is to advance their member firms' shared interests (Barnett, 2013). As such, trade associations often play an active and key role in implementing industry self-regulation (Barnett, 2013; King and Lenox, 2000; Lenox and Nash, 2003). By forming a trade association, the board avoids the potential issue of mainly focusing on the problems of the social alliance member firms and ignoring the problems of other industry participants. As industry participants join the association and relationships are established, the trade association develops a unique position to oversee and verify self-regulation action as well as to apply normative pressure on member firms to comply (Lenox and Nash, 2003). Firms adopting industry self-regulation standards and practices will receive benefits in that they can join in collective action to address industry issues (Barnett, 2013; Lenox and Nash, 2003). This will be increasingly important, especially for small firms with fewer resources; as the power and capabilities of AI continue to increase, new problems affecting the entire industry will arise. Additionally, industry self-regulation can enact problem prevention that prevents negative events from one firm's problems from affecting other firms in that industry (Barnett and King, 2008). As AI continues to scale, the chance of a firm creating a negative event greatly increases. However, firms that adopt industry self-regulation will be provided some protection from negative effects associated with the event.

DISCUSSION AND CONCLUSIONS

AI presents an incredible opportunity to make substantial progress on the UN's development goals. However, AI's possible hindrance to those goals cannot be ignored. The independent oversight board model presented here allows for the timely creation and scaling of market-based governance. By first creating the independent oversight board at the firm level, real governance can begin quickly and with low complexity. The board can then be scaled to a social alliance that creates shared governance for the top influential firms in AI. The social alliance level of governance increases formation complexity and implementation time, but can provide governance for the most influential AI firms that are creating, implementing, and controlling the technology. Finally, the board can evolve from the social alliance level to create industry self-regulation where standards and practices that aid sustainable AI are established and can be adopted by any industry participant. While industry self-regulation is the most complex and time intensive level of market-based governance, it can provide meaningful governance for most firms outside of government regulation.

In conclusion, sustainable AI governance requires a multi-faceted approach, encompassing government regulation, firm-level governance, social alliances, and industry self-regulation. By combining these approaches, it is possible to guide the development and deployment of AI technologies in a manner that promotes positive impacts on the SDGs while addressing potential risks and challenges. The establishment of independent oversight boards, as demonstrated by the Facebook Oversight Board, presents a promising model for market-based governance of AI that can be extended to broader industry contexts.

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