



The ethical principles and regulatory frameworks that shape the global landscape of artificial intelligence (AI), situating the analysis within the context of leading international efforts to study and govern AI ethics

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Abstract

The swift evolution of artificial intelligence (AI) has become a central force driving digital transformation across numerous sectors, including finance, healthcare, education, and security. However, this progress also raises profound ethical and regulatory challenges. This study aims to analyze global approaches to AI ethics and governance through a comprehensive review of leading scholarly works. Floridi et al. (2018), through the AI4People initiative, proposed an ethical framework based on five core principles: promoting good, preventing harm, respecting autonomy, ensuring fairness, and maintaining transparency. These principles are designed to ensure that AI development serves the public good while upholding fundamental human values. Similarly, Mittelstadt et al. (2016) explored ethical concerns associated with computational systems, highlighting issues such as bias, discrimination, and lack of transparency in automated decision-making. Their findings suggest that without effective governance mechanisms, AI systems risk reinforcing existing social inequalities. Meanwhile, Cath (2018) approaches the issue from a legal and policy standpoint, identifying obstacles in national and global AI regulation, including differing country policies and the necessity for flexible yet robust legal frameworks. Based on these insights, this paper contends that AI ethics and governance should be viewed as deeply interrelated dimensions. Developing responsible AI requires a synthesis of ethical standards, legal frameworks, and technological innovation aimed at promoting collective well-being. Therefore, international organizations, governments, and academic institutions play a crucial role in establishing consistent global guidelines to ensure that AI advancement aligns with human-centered values.

Keywords:

Artificial Intelligence Ethics; Global Governance; UNESCO Recommendation; AI4People Framework

A. INTRODUCTION

All The development of artificial intelligence (AI) marks one of the most transformative milestones in modern human civilization. This technology has permeated nearly every dimension of life—ranging from finance and education to transportation, healthcare, and defense. AI has evolved beyond being a mere analytical tool; it now functions as an autonomous system capable of making complex decisions independently. However, as its global integration accelerates, pressing concerns have emerged surrounding the ethical, social, and legal implications of its rapid expansion.

Ethical challenges in AI revolve around key questions of accountability, fairness, data privacy, and human rights impacts. Through the AI4People initiative, Floridi et al. (2018)

identified five core principles essential to fostering an ethical AI ecosystem: beneficence, non-maleficence, autonomy, justice, and explicability. These principles serve both as moral cornerstones and as drivers for shaping global policy frameworks that place human well-being at their core.

Meanwhile, Mittelstadt et al. (2016) emphasized the inherent flaws in algorithmic systems, such as biased datasets, automated discrimination, and opaque decision-making processes. These shortcomings reveal that algorithms, often perceived as objective, can inadvertently reproduce existing social inequalities if not designed with strong ethical safeguards. Such ethical concerns are global in nature, as AI technologies created in one cultural or national context are often deployed across borders without adaptation to local norms or values.

Cath (2018) introduced a governance perspective, arguing that AI oversight should integrate technical innovation with legal, societal, and political dimensions. According to Cath, the central challenge lies in reconciling technological progress with the preservation of fundamental human values. Since nations differ in their preparedness for AI adoption, there is a growing need for a unified international framework that harmonizes ethical principles and governance practices while fostering innovation responsibly.

Responding to these global challenges, UNESCO released the Recommendation on the Ethics of Artificial Intelligence in 2021—the first universal normative framework guiding the ethical design and use of AI. This recommendation articulates four guiding values: respect for human rights and dignity, promotion of environmental sustainability, fairness and non-discrimination, and accountability and transparency. UNESCO (2021) highlights that AI should be developed and implemented with attention to social inclusion, gender equality, and ecological preservation. With endorsement from more than 190 member states, the recommendation symbolizes a collective global commitment to ensuring AI serves the common good.

The adoption of this framework demonstrates that AI ethics transcends theoretical discourse, becoming a tangible element of global governance that must be implemented by both governments and private entities. UNESCO's approach connects ethical ideals with regulatory mechanisms, ensuring that AI advancements remain not only efficient and profitable but also socially and environmentally responsible. In an era of technological globalization, embedding shared humanistic principles is crucial for AI to function as a force for harmony rather than a driver of inequality.

In light of these developments, this paper aims to examine the dynamic relationship between ethics and governance in the global evolution of AI. The focus lies on identifying widely recognized ethical principles, analyzing key governance models such as AI4People and the 2021 UNESCO Recommendation, and evaluating cross-border challenges in implementing AI ethics. Through this exploration, the study seeks to contribute to a deeper understanding of how the international community can cultivate equitable, sustainable, and human-centered AI innovation.

B. METHODS

This research adopts a descriptive qualitative approach through a systematic literature review. The method was chosen to attain a deeper understanding of the concepts, ethical frameworks, and governance mechanisms associated with artificial intelligence (AI), drawing insights from a wide range of international academic and policy sources. The primary objective of this design is to explore the interconnection between AI ethics and global regulatory initiatives while identifying universally recognized principles within AI governance.

Through this methodology, the researcher examines conceptual and descriptive data extracted from scholarly literature, including peer-reviewed journal articles, international organization reports, and policy papers. Hence, the results are not intended to test specific hypotheses but to provide a holistic perspective on the worldwide evolution and implementation of AI ethics and governance systems.

Data collection was conducted through a structured search across major academic databases such as Google Scholar, ScienceDirect, SpringerLink, and the UNESCO Digital Library. The inclusion criteria were as follows: Publications issued between 2016 and 2025, A thematic

focus on AI ethics, governance, or regulatory practices., Authored or published by reputable academic institutions or recognized international bodies.

Meanwhile, the research process consisted of several stages including identification of literature relevant to the central theme of AI ethics and regulation, categorization of selected works based on dominant thematic areas (ethical, policy-related, legal, and social dimensions) and content analysis aimed at identifying key ethical principles, governance strategies, and cross-national variations in regulatory approaches.

C. RESULT & DISCUSSION

The UNESCO Recommendation on the Ethics of Artificial Intelligence (2021) emphasizes the importance of establishing inclusive global standards that address disparities among nations and mitigate the risks of algorithmic bias. Previous emphasize that UNESCO's framework is unique in its global legitimacy, having been adopted by 193 countries studies (UNESCO, 2021; Yeung et al., 2023). The current findings confirm that UNESCO's focus on inclusion, social justice, and the digital divide directly addresses concerns raised by scholars such as Eubanks (2018) and Noble (2018), who document how algorithmic systems can reinforce structural inequalities when ethical oversight is weak. In comparison, the AI4People Framework (2018) places greater focus on the ethical dimension of AI, advancing the concept of "AI for a Beneficial Society" to ensure that technological progress consistently enhances human well-being. Meanwhile, Cath (2018) introduces a governance perspective, highlighting the need for adaptable legal frameworks that can regulate AI systems not only from an ethical standpoint but also through enforceable policy measures.

Analysis of these frameworks reveals that each contributes a distinct yet complementary perspective: UNESCO provides an inclusive, globally oriented ethical foundation; AI4People centers on moral and humanistic principles; and Cath's model incorporates the legal and policy mechanisms necessary for practical oversight. Collectively, these perspectives demonstrate that AI ethics cannot be treated as a static or singular concept but must instead be understood as an evolving synthesis of ethical norms, legislative instruments, and governance practices. Such integration is essential to effectively address challenges like algorithmic discrimination, unequal access to digital resources, and socio-technical divides.

These findings are consistent with previous research warning of the potential consequences of unregulated AI, including exacerbated inequality, data misuse, and breaches of privacy. Despite growing international awareness, the central obstacle remains in achieving cohesive global implementation, as disparities in national policies and enforcement mechanisms often hinder collective progress. Therefore, this study underscores the urgent need for strengthened transnational collaboration and shared governance structures to ensure that AI development aligns with ethical imperatives and contributes positively to sustainable and equitable global advancement.

Table 1. Summary of Global Leadership in the Study and Regulation of Artificial Intelligence Ethics: Core Values Identified Across Literature Reviews, Scholarly Articles, and Institutional Reports.

Source	Main Focus	Dominant Ethical Principles	Regulatory Approach	Key Findings
UNESCO (Recommendation on the Ethics of Artificial Intelligence)	Global ethics based on human rights and sustainable development	Fairness, inclusion, privacy, accountability and social responsibility	International regulations based on human rights and social justice values	The first global recommendation was adopted by 193 countries. It highlights algorithmic bias, the digital divide, and the need for human oversight. Consultations on implementation will continue until 2025.
AI4People – Floridi et al.	Establishing ethical foundations for a “Good AI Society”	Benevolence, non-malevolence, autonomy, justice, explicability	Non-binding ethical guidelines (soft law)	Proposes five universal principles for ethical AI; serves as a reference model for other global frameworks such as OECD and UNESCO.
Cath (University of Oxford) – Governing Artificial Intelligence	Global AI policy and legal governance	Accountability, justice, security	Adaptive and collaborative regulation	Developing an adaptive governance model so that AI policies can keep pace with the pace of technological innovation.
OECD (2021)	International cooperation and data governance in AI	Transparency, robustness, human-centered values	Policy recommendations for responsible AI development	OECD’s AI Principles are widely adopted by member countries to ensure trustworthy AI aligned with democratic values
European Commission (AI Act Proposal, 2023)	Risk-based approach to AI regulation	Safety, accountability, transparency	Legally binding regulation within the EU	Introduces a comprehensive risk-tier framework that classifies AI systems based on potential harm; expected to set a global precedent for AI governance.

AI Ethics Framework Timeline (2018-2025)

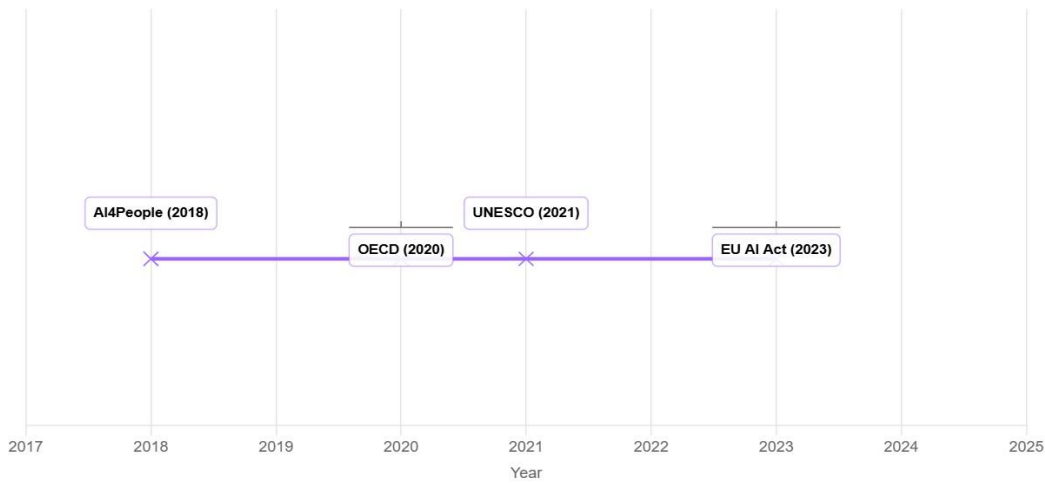


Figure 1. AI Ethics Framework Timeline (2018-2025)

Figure 1 presents the evolution of major AI ethics and governance frameworks from 2018 to 2023, showing a gradual shift from ethical principles toward formal regulation. The timeline begins with AI4People (2018), which emphasizes foundational ethical values such as autonomy, justice, and explicability, reflecting an early normative approach to AI governance. This is followed by the OECD AI Principles (2020/2021), which introduce policy-oriented guidance focused on transparency, robustness, and human-centered values. In 2021, UNESCO’s Recommendation on the Ethics of Artificial Intelligence expands the ethical scope by integrating human rights, inclusion, and social responsibility at a global level. The timeline culminates with the EU AI Act (2023), marking a transition to legally binding, risk-based regulation. Overall, the figure highlights the increasing institutionalization and enforceability of AI governance frameworks over time.

Number of Ethical Principles per Source



Figure 2. Number of Ethical Principles per Source

Figure 2 shows the number of ethical principles emphasized by major AI governance frameworks. UNESCO and the OECD present the highest number of principles, indicating a broad and comprehensive ethical scope. AI4People and Cath (Oxford) include a moderate number of

principles, reflecting a more focused ethical and governance approach. In contrast, the EU AI Act emphasizes fewer ethical principles, which reflects its orientation toward legal enforceability and risk-based regulation rather than extensive normative formulation. Overall, the figure suggests a trade-off between ethical breadth and regulatory specificity across AI governance frameworks.

Regulatory Approaches in AI Governance

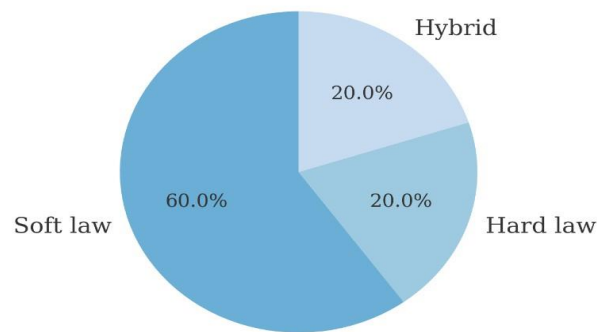


Figure 3. Regulator Approaches in AI Governance

Figure 3 illustrates the distribution of regulatory approaches in AI governance. The majority of frameworks adopt a soft law approach (60%), indicating that AI governance is still largely guided by non-binding ethical principles and policy recommendations. Hard law regulation accounts for 20%, reflecting the limited but growing use of legally binding instruments, particularly in jurisdictions such as the European Union. The remaining 20% represents hybrid approaches, which combine ethical guidelines with regulatory mechanisms. Overall, the figure suggests that AI governance currently prioritizes flexibility and ethical guidance, while gradually moving toward stronger legal enforcement.

Geographic Scope of AI Ethics Frameworks

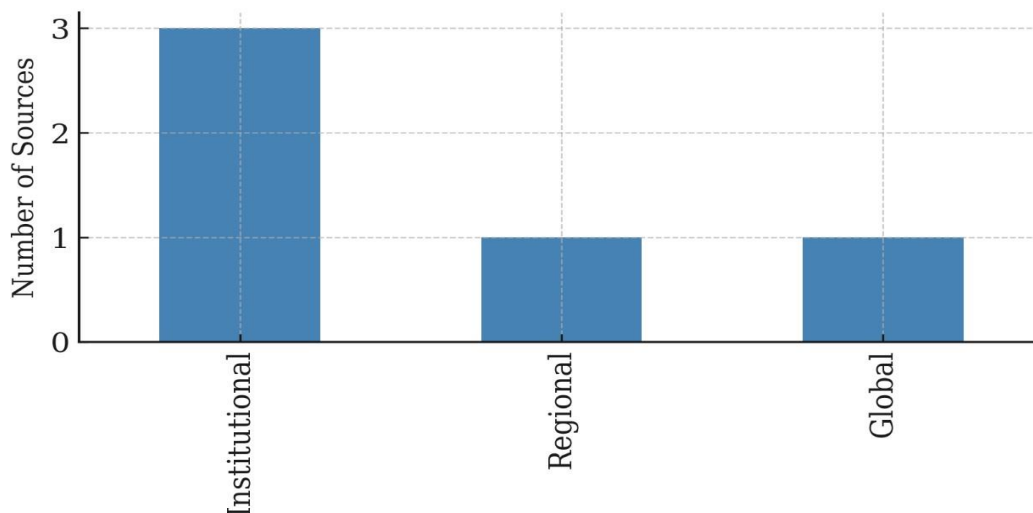


Figure 4. Geographic Scope of AI Ethics Frameworks

Figure 4 depicts the geographic scope of AI ethics frameworks. Most frameworks operate at the institutional level, indicating that AI ethics initiatives are often developed by specific organizations or academic institutions. Regional frameworks are less common, reflecting limited supranational coordination beyond certain jurisdictions. Global frameworks represent a smaller but significant portion, highlighting efforts to establish universally applicable ethical standards. Overall, the figure suggests that AI ethics governance is still dominated by institution-based

initiatives, with global harmonization remaining a developing process.

D. CONCLUSION

This study concludes that ethics and regulation of Artificial Intelligence (AI) are interrelated components that require a combination of moral norms, legal systems, and human-centered innovation. A literature review shows that there's synergy between global frameworks, namely AI4People (as an ethical foundation), UNESCO Recommendations (as global normative standards), and risk-based regulatory approaches such as the European AI Act (as a binding legal framework).

Although ethical consensus has been reached, the main challenge lies in global implementation amid differing national strategies, which could potentially exacerbate algorithmic bias and social inequality. Therefore, strong international collaboration is needed to harmonize standards and ensure that AI advances are directed toward maximizing social benefits and minimizing risks, making it an agent of global harmonization.

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