Path of International Legal Regulation of Artificial Intelligence in the Digital Economy Era

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Abstract: In the digital economy era, the development and advancement of artificial intelligence have triggered novel legal regulatory dilemmas, posing global challenges. The risks posed by Artificial Intelligence must be addressed through the establishment of a global governance framework, a technical standard system, and a dispute resolution mechanism. Regulating Artificial Intelligence through international law represents the optimal solution within the existing global governance paradigm. This paper employs case studies and comparative analysis to examine current Artificial Intelligence legal regulatory pathways, primarily including sovereign state legislation, regional collaborative regulation, and bilateral coordination mechanisms. By analyzing their inherent institutional deficiencies, the study concludes that only a multilateral governance framework centered on international law can achieve a leap in governance efficacy while safeguarding technological sovereignty. Additionally, China's responsive measures are elaborated. Regulating Artificial Intelligence through international law will facilitate the formation of a new digital-era legal order characterized by inclusiveness and effectiveness.

1 INTRODUCTION

As digital technologies reshape the global economic landscape, traditional legal frameworks face unprecedented challenges in addressing legal issues arising from artificial intelligence, with the structural contradiction between technological iteration and legal lag becoming increasingly pronounced.

Current academic research on artificial intelligence governance predominantly focuses on technical ethics or domestic legislation, revealing a theoretical gap in transnational collaborative governance. To date, non-state actors have not proposed or coordinated binding international hard law. When nations prioritize self-interested benefit distribution over reliance on enforceable international hard law to sustain cooperation, non-state actors' reliance on international soft law alone cannot ensure the credibility of national commitments (Schwemer et al., 2022). Consequently, inter-state cooperation remains unstable, exacerbating value conflicts across diverse cultural contexts. Furthermore, international law contains minimal specific provisions on artificial intelligence. Instruments such as the International Covenant on Economic, Social and Cultural Rights and the International Covenant on Civil and Political Rights only broadly address rights related to freedom of thought, privacy protection, and non-discrimination, reflecting that international legal innovation remains confined to ethical dimensions (Dwivedi et al., 2019).

This study aims to address the governance dilemmas posed by artificial intelligence in the context of international legal regulation. By revealing the functional deficiencies of existing national laws and regulations, it creatively proposes a global cooperative pathway for artificial intelligence governance. The paper advocates clarifying existing defects, governance necessity, and fundamental elements to construct a new international legal order for the digital era while ensuring technological innovation.

2 LITERATURE REVIEW

Scholars have proposed various pathways to regulate artificial intelligence in the digital economy era. One approach is sovereign state legislation, exemplified by the United States's unilateral Political Declaration on the Responsible Military Use of Artificial

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Intelligence and Autonomy (Roberts et al., 2020). Nations may establish gradient regulatory systems based on their digital economic development levels. However, such fragmented legislation leads to overlapping compliance costs. Another proposal is regional collaborative regulation. For instance, the European Union and the United States have engaged in technical cooperation, such as the third EU-U.S. Joint Technology Competition Policy Dialogue (TCPD) held in Washington in March 2023, aimed at consolidating collaborative outcomes and ensuring fair competition in the digital domain (Von Struensee, 2021). Nonetheless, this model risks technological hegemony, and regional governance rules face challenges in global scalability.

Additionally, scholars advocate bilateral coordination mechanisms. In August 2020, Singapore and Australia signed the Singapore-Australia Digital Economy Agreement (SADEA), accompanied by memoranda of understanding (MoUs) to promote Artificial Intelligence best practices and shared ethical governance frameworks (Shen & Zhao, 2023). While bilateral models enhance regulatory efficiency, they entail issue-linkage risks, with some agreements imposing conditions such as data localization or market access.

Based on this analysis, this study concludes that although the current international legal framework for regulating Artificial Intelligence remains incomplete, it represents the sole pathway capable of balancing national sovereignty with the uneven technological development and digital economic disparities underlying Artificial Intelligence. A multi-stakeholder governance model not only accelerates Artificial Intelligence advancement but also fosters a universally equitable global legal governance environment.

3 CURRENT LEGAL REGULATION OF ARTIFICIAL INTELLIGENCE

3.1 Domestic Legal Pathways

In 2017, the State Council of China issued the New Generation Artificial Intelligence Development Plan (AIDP), establishing a national Artificial Intelligence strategy through 2030. Managed by the Ministry of Science and Technology (MOST), the New Generation Artificial Intelligence Development Plan aims to guide private enterprises toward Artificial Intelligence ethical development and deployment aligned with state values. To this end, the Chinese government has incentivized Artificial Intelligence initiatives by private enterprises, provided such initiatives conform to its values and objectives. However, the New Generation Artificial Intelligence Development Plan's failure to precisely define artificial intelligence has triggered a series of complex issues.

The 2023 Artificial Intelligence Law established a "classified and tiered regulatory" framework. On October 18 of the same year, the Cyberspace Administration of China released the Global Artificial Intelligence Governance Initiative, emphasizing the establishment of a risk-level testing and evaluation system, safeguarding personal privacy and data security in Artificial Intelligence research, development and application, achieving fairness and non-discrimination principles, and improving Artificial Intelligence ethical guidelines, norms, and accountability mechanisms (Guo & Xu, 2024). However, challenges persist, including overly abstract principles, regulatory frameworks lacking practical implementation experience, and instances of regulatory absence or overreach.

The United States primarily adopts an "interstate legislation + federal guidance" model to regulate Artificial Intelligence. For example, California's proposed comprehensive Artificial Intelligence framework-Assembly Bill 311-requires companies developing critical Artificial Intelligence products (in employment, education, housing, etc.) to conduct impact assessments, provide notice and opt-out rights to California residents, and implement governance plans with reasonable administrative and technical safeguards to address algorithmic discrimination risks (Raja & John, 2019). This law would be enforced by the California Attorney General and includes limited private litigation rights. Although the bill remains under committee review, California's legislature tends to proactively regulate tech policy issues regardless of federal or other states' actions.

Meanwhile, New York State has proposed requirements for bias audits of Artificial Intelligence recruitment tools. However, measures such as impact assessments may impede Artificial Intelligence enterprises' research, development, and growth to some extent. These measures are confined to domestic technological advancement, diminishing opportunities and efficiency for international collaboration, restricting the progress of global Artificial Intelligence projects, and posing obstacles to the synergistic development of worldwide data flows and the digital economy.

3.2 Regional Collaborative Pathways

On April 21, 2021, the European Commission promulgated the Artificial Intelligence Act (AIA), which preliminarily articulates the EU's values, fundamental rights and principles, as well as its commitment to democracy and the rule of law. The Act aims to create a fair competitive market for the provision of Artificial Intelligence systems, protect fair and responsible digital services, and align with appropriate data governance and the Data Act to achieve comprehensive digital transformation (Buckley et al., 2021).

However, the Artificial Intelligence Act does not adopt a rights-based approach, such as introducing new rights for individuals affected by Artificial Intelligence system decisions. Instead, it focuses on regulating Artificial Intelligence system providers and users in a manner akin to product supervision.

Furthermore, the Act defines Artificial Intelligence systems broadly as "machine learning or logic-and knowledge-based systems." This expansive definition extends prohibitions-for example, against the use of Artificial Intelligence for social scoring-to private entities, thereby constraining the scope of permissible Artificial Intelligence applications.

The Artificial Intelligence Act also restricts the discretionary authority of the European Commission by establishing common technical specifications for high-risk and general-purpose Artificial Intelligence systems. As a result, many existing legal Artificial Intelligence and information system use cases may fall under the scope of this Act. Only a very limited number of legal Artificial Intelligence and information systems are classified under the high-risk category of "judicial management and democratic processes," requiring third-party certification for high-risk Artificial Intelligence systems. This results in 25 legal Artificial Intelligence and information systems within this domain, particularly those in private practice, remaining uncovered, thereby generating significant regulatory gaps.

3.3 Bilateral Treaty Pathways

In August 2020, Singapore and Australia officially signed the Singapore-Australia Digital Economy Agreement (SADEA). Under this agreement, 12 specific memoranda of cooperation were established, with Memorandum No. 7 exclusively targeting the field of Artificial Intelligence governance. This document defines three core components: algorithm transparency benchmarks, data ethics evaluation mechanisms, and norms for cross-border Artificial Intelligence research and development collaboration.

Article 15 of the agreement includes an ancillary clause requiring participating enterprises to establish data mirror servers in each other's countries. This has forced some small and medium-sized enterprises (SMEs) to withdraw from cooperation projects due to cost pressures. Additionally, Article 8.3 links Artificial Intelligence regulatory cooperation to digital service market access, heightening issue-linkage risks.

In April 2022, the United States and the European Union signed the Transatlantic Artificial Intelligence Cooperation Framework. The agreement encompasses technical standard alignment, mutual recognition of ethical governance, and sharing of research and development resources. However, its implementation has revealed dual effects: the protocol annex mandates that participating parties undergo each other's data protection reviews, leading a significant portion of European SMEs to abandon the U.S. market due to compliance costs.

3.4 Disadvantage Analysis

In summary, regarding the regulatory pathways for artificial intelligence, the sovereign state legislative approach suffers from defects such as international detachment. Nations focus solely on their own development, reducing international cooperation and restricting the advancement of global Artificial Intelligence projects. Additionally, fragmented legislative approaches, such as the U.S. "interstate legislation + federal guidance" model, lead to overlapping compliance costs. Divergent national values, objectives, and definitions of Artificial Intelligence further exacerbate these issues. Moreover, overly abstract principles and regulatory frameworks characterized by gaps or overreach are prevalent across nations (Li, 2024).

The regional collaborative regulatory model carries risks of technological hegemony, aggravating technological lag in less-developed Artificial Intelligence nations, while regional governance rules themselves face challenges in global scalability. Bilateral coordination mechanisms similarly entail negative impacts such as spillover effects and issue-linkage risks, coupled with insufficient enforcement capacity.

4 INTERNATIONAL LEGAL REGULATION PATHWAY FOR ARTIFICIAL INTELLIGENCE

4.1 Innovative Design of International Legal Regulation

The development of Artificial Intelligence has brought about global challenges. Government strategies designed to incentivize domestic Artificial Intelligence research may lead to fragmentation in global governance frameworks, which, in the long term, threatens regulatory stringency competition. Under these circumstances, nations attract Artificial Intelligence industries through national strategies and incentives to accelerate Artificial Intelligence development yet fail to correspondingly strengthen regulatory efforts to mitigate the societal risks arising from such advancements. Concurrently, lax regulation and intense competition increase the likelihood of biased and socially harmful systems, even posing existential threats to human life, underscoring a pressing security imperative. Issues such as Artificial Intelligence discrimination and privacy violations also necessitate a unified ethical framework for resolution. Therefore, the pathway of regulating Artificial Intelligence through international law carries significant necessity.

The substantial risks posed by the rapid development of Artificial Intelligence must be addressed through the establishment of a global governance framework, a technical standard system, and dispute resolution mechanisms. International legal regulation represents the optimal solution within the existing global governance paradigm. International law, formulated by expert teams, can provide legitimate global rules and effective solutions in the international competition for advanced Artificial Intelligence system development. Simultaneously, it supports the efficient growth of the Artificial Intelligence industry, fosters trust between nations and technology developers, and facilitates the global implementation of beneficial systems and practices (Periche, 2020).

A globally coordinated Artificial Intelligence governance mechanism should comprise interconnected and overlapping national standards, best practice initiatives, and normative declarations and principles issued by international organizations-all grounded in the integration of historical and contemporary legal frameworks across multiple jurisdictions. A thorough understanding of the impacts and shortcomings of past Artificial Intelligence regulation is essential to form an updated and optimal regulatory framework.

Given the high degree of industry control and influence in global Artificial Intelligence development, the issue of private power is critical. Building on this, greater emphasis must be placed on rights protection.

Furthermore, since the social, economic, and environmental challenges highlighted by Artificial Intelligence are not merely technical outcomes but intertwined with broader and disparate systems, the framework issue is paramount. It is imperative to explore additional potential collaborative governance forms in global discussions on discrimination, accountability, energy use, privacy, and other dimensions from an Artificial Intelligence perspective.

4.2 China's Responses Measures in the Design of International Legal Regulation for Artificial Intelligence

4.2.1 Domestic-Level Response Measures

In accordance with new international legal rules, refining traditional domestic sectoral laws and related institutions to establish a comprehensive domestic regulatory system for Artificial Intelligence is critical. During the construction of this system, it is essential to incorporate fundamental ethical norms and consensus, particularly aligning with existing specialized international Artificial Intelligence legal norms and fully implement and enforce them.

Simultaneously, as big data serves as the cornerstone of Artificial Intelligence development, and Artificial Intelligence developers rely on data to execute their work, the advancement of data governance is paramount. Only by ensuring robust data governance can Artificial Intelligence be effectively regulated.

Under a universal and equitable legal governance environment, Artificial Intelligence technological research and development will inevitably be promoted. This progressive relationship entails improving domestic legislation under the guidance of international law to achieve the goal of accelerating Artificial Intelligence development.

4.2.2 International-Level Response Measures

As the world's second-largest economy and a frontier nation in Artificial Intelligence development, China

should actively participate in formulating and constructing the international legal regulatory system for Artificial Intelligence, contributing its wisdom and strength to global data governance and the digital economy. The establishment of this system requires not only governmental involvement but also broad participation from non-governmental entities. Both types of stakeholders in China should collaborate to foster a secure and stable international environment for Artificial Intelligence application and governance.

Additionally, China should proactively engage in the formulation of international rules such as international soft law, industry norms, and ethical consensus. By contributing cutting-edge theoretical foundations and valuable experience to global, regional, and national efforts, China will deepen regional and inter-state cooperation, driving progress in Artificial Intelligence technical standards recognized by nations and globally.

5 CONCLUSION

This study employs the case study method and comparative analysis method to investigate the legal regulatory approaches for Artificial Intelligence. By analyzing specific cases and regulatory principles of existing legal pathways for Artificial Intelligence regulation, the paper identifies their respective governance defects and relative advantages, thereby introducing the international legal regulation pathway along with its strengths and governance outcomes.

Through deconstructing three practical pathways-sovereign state legislation, regional collaborative regulation, and bilateral coordination mechanisms-the study reveals their inherent institutional deficiencies, including regulatory fragmentation caused by sovereign legislation, technological hegemony risks inherent in regional models, and conditional constraints faced by bilateral agreements. It concludes that, compared to existing governance pathways, constructing a multilateral governance framework centered on international law can achieve a leap in governance efficacy while safeguarding technological sovereignty. Additionally, China's response measures are elaborated in detail, manifesting in domestic-level actions such as refining legislation, enhancing technological research and development, and strengthening data governance, as well as international-level measures including participation in rulemaking, deepened regional cooperation, and recognition of technical standards.

Against the backdrop of digital technologies reshaping global governance structures, the legal regulatory dilemmas triggered by Artificial Intelligence necessitate breaking away from traditional legal regulatory models. The innovation of the international legal regulatory system lies in its reliance on a multi-stakeholder collaborative governance mechanism to resolve the "soft law dilemma" and credibility challenges of commitments. Future research should delve into the concrete implementation mechanisms of Artificial Intelligence governance under the international legal framework, prioritizing core issues such as cross-border data flows and digital sovereignty, to advance the formation of a digital-era legal order characterized by both inclusiveness and effectiveness.

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