

International Comparisons and Implications for Regulatory Policy and Management of Artificial Intelligence

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Abstract. With the rapid development of technology, artificial intelligence is becoming an important grip on industrial innovation and an important driver of new quality productivity. However, technological progress also brings challenges such as ethical issues and security issues. The safety and controllability of AI technology is an important part of scientific and technological security, and effective governance and regulation of AI has become a global consensus, while the European Union, the United States and the United Kingdom have been at the forefront of international regulation of AI. From a policy perspective, this paper systematically combs through the development of AI regulatory measures in the EU, the U.S. and the U.K., and compares their distinctive practices in the setting of regulatory agencies, regulatory scope and regulatory path. It is found that the AI regulatory models of the EU, the US and the UK have their own characteristics, but there are regulatory commonalities and common trends. Based on this, the paper puts forward countermeasure suggestions for China's AI regulation, with a view to providing decision-making reference for the formulation of AI regulatory strategies.

Keywords: Artificial Intelligence; Policy; Technology Security; Regulation.

1. Introduction

As an innovative “catalyst” for the advancement of industrial society to intelligent society, Artificial Intelligence (AI) has had a profound impact on human society. However, with the continuous iteration of AI technology and the continuous generalization of application scenarios, especially the rapid development of generative AI represented by ChatGPT and other generative AI, new challenges such as data privacy, algorithmic discrimination, safety and ethics, intellectual property rights and so on have accelerated [1]. Artificial intelligence began to show the attribute of the ability to influence individual behavior, social resource allocation and government decision-making, generating the risk of alienation of rights, and becoming an important part of the science and technology security system. Therefore, the regulation of artificial intelligence has begun to become a key concern of countries around the world. Regarding the regulation of artificial intelligence, relevant research mainly focuses on four aspects. Firstly, the discussion on the regulation of AI applications is mainly focused on the medical [2-3] and financial fields [4]. Secondly, explore the specific problems in the regulation of artificial intelligence, mainly focusing on the field of ethical governance [5]. Thirdly, analyze the content of AI regulatory initiatives or regulatory policies for a particular country [6], and lastly the risks and governance of generative AI are analyzed [7].

The international comparison of AI regulation can help improve the science and technology security system, improve the understanding of AI governance and enhance the ability to regulate AI, and avoid falling into the situation of isolated regulation. The European Union, the United States and the United Kingdom have an early understanding of AI regulation, and have formed experiences that can be referred to and learned from. Therefore, on the basis of detailed analysis of the evolution of AI regulatory initiatives in the EU, the U.S. and the U.K., this paper compares their practices in terms of regulatory agencies, regulatory scope, regulatory paths, etc., and summarizes their common features to provide reference for the formulation of AI regulatory measures.

2. International Practices of Artificial Intelligence Regulatory Policy Measures

2.1. European Union

The EU has been exploring the construction of a regulatory system for the application of AI technology since 2016, and it is committed to constructing a coherent governance system suitable for the development of Europe from the perspective of the European level as a whole. Prior to 2017, although the EU was continuously paying attention to the potential risks of the development of the AI field, it had not yet issued a guiding document specifically for the regulation of AI, and it mainly relied on the Antitrust Law formulated in 2002 and the anti-unfair competition law enacted in 2005 for enforcement. After 2017, in order to respond to the rapid development of AI technology and its complex social, economic and ethical impacts, the EU has begun to shift to more specific and systematic regulatory policies, and has formulated a series of strategic plans covering coordinated programs and ethical guidelines, which lay the trustworthy development and regulation of AI, and proposes a more specific regulatory framework and recommendations to ensure that the development and application of AI align with the values and legal framework of the European Union.

In April 2021, the EU's Artificial Intelligence Bill (Proposal) was formally released, which seeks to establish a comprehensive legal framework to address the various challenges and opportunities presented by AI technologies in order to promote the sustainable development and innovation of AI. In the context of the rapid development of the big models of AI represented by ChatGPT, the EU has accelerated the pace of legislation, and after many rounds of discussion and modification, the EU released the world's first "Artificial Intelligence Act" (EU AI Act) in July 2024, which is also the most comprehensive AI-specific regulatory bill in the world so far, further consolidating the EU's position in the global leadership on technology regulation.

2.2. United States

Prior to 2018, fewer U.S. policies addressing the field of AI dealt with regulatory aspects. In 2019-2020 The U.S. began to accelerate its layout in the field of AI. In February 2019, the Trump administration passed the Executive Order on Maintaining U.S. Leadership in Artificial Intelligence (EO 13859), which set the general tone for AI development in the U.S.; followed by the release of the U.S. Artificial Intelligence Initiative and the National Strategic Plan for Artificial Intelligence Research and Development to maintain its leadership in AI technology. After 2021, the U.S. began to accelerate its regulation of AI, with several departments and organizations strengthening regulation of AI technologies in their respective areas of interest.

The 2024 Artificial Intelligence Index Report published by Stanford University's Humanistic Artificial Intelligence Institute (Stanford HAI) reveals that 61 well-known AI models were developed by U.S. organizations in 2023, a number that exceeds the EU's 21 and China's 15. In addition, private capital investment in AI in the United States totaled \$67.2 billion, almost nine times more than the corresponding investment in China, showing that the United States continues to focus on promoting development in its regulation of AI.

2.3. United Kingdom

Prior to 2018, the UK had not yet introduced a framework policy or guidance on regulation in the area of AI, but had initially introduced a stance to strengthen AI regulation, with regulation directed primarily at the use and protection of data. In August 2018, the UK launched the Data Ethics Framework and established the Centre for Data Ethics and Innovation (CDEI), which aims to explore the maximum possibilities of emerging technologies under ethical and moral guidance and provide professional advice to the government. The UK has introduced several regulatory documents in recent years in order to achieve its goal of being a global leader in AI regulation. In November 2023, the first Global AI Safety Summit was held in the UK, where the Bletchley Declaration was released, which is the first international statement on AI as a rapidly emerging technology, highlighting the UK's attempts to develop a global strategy on AI regulation.

3. International Comparison of Artificial Intelligence Regulation

The EU, the U.S. and the U.K., as countries/organizations at the forefront of international AI regulation, have different ways and means of regulation. This part compares the three countries/organizations in terms of the setting of regulatory agencies, the scope of regulation, and the distinction in the regulatory path (Table 1), to clarify the international mainstream AI regulatory strategy.

Table.1 International Comparison Intelligence Regulation

Comparative Dimension	European Union	United States	United Kingdom
Regulatory Agency	Established AI Senior Expert Group and ChatGPT Governance Task Force; Continuously planning to promote comprehensive regulator	A series of functional agencies have been set up to strengthen coordination; a specialized regulatory agency is proposed	Regulatory responsibilities are shared by departments in different fields and at different levels
Regulatory Scope	Full life-cycle regulation, covering before, during and after the event	Application-specific regulation, focusing on ex post	Application-specific regulation, focusing on ex post
Regulatory Path	Dual regulatory system	Regulation by the legislature, the executive and the judiciary in their respective areas of competence	Decentralized regulation relying on existing institutions

3.1. Regulatory Institutional Set-up: Centralization or Decentralization

The EU has established a Senior Expert Group on AI and a ChatGPT Governance Task Force, and has been planning to move forward with the creation of a comprehensive regulator. For example, the AI Regulation issued by the European Commission in 2021 foresees a specialized national supervisory body to ensure the application and enforcement of the law. The Regulation provides for a European Data Protection Supervisor in charge of AI systems developed by EU institutions and organizations.

The U.S. has not yet determined the competent agency for AI regulation, but has successively set up a series of functional agencies to strengthen the coordination of the implementation of AI strategy, such as the White House Office of Science and Technology Policy led the establishment of the National AI Initiative Office, the Department of Commerce's Office of AI Initiatives set up an AI Advisory Committee, and reorganized the Special Committee on Artificial Intelligence into the Interagency Committee on Artificial Intelligence. The United States is also actively preparing to deploy a national-level regulatory authority.

The UK does not have a centralized cabinet department dedicated to regulating AI applications, but rather a number of departments dispersed across different areas and levels that share this task. For example, in the area of data protection, the Information Commissioner's Office has been established; in the area of market competition, the Competition and Markets Authority has been set up; and in the area of financial services, the Financial Conduct Authority, among others, is responsible for regulatory matters. However, in November 2023, the UK introduced the Artificial Intelligence (Regulation) Bill to Parliament, which calls for the establishment of an Artificial Intelligence Authority.

3.2. Scope of Regulation: Comprehensive Regulation or Outcomes Regulation

The EU has implemented a regulatory model covering the entire life cycle of AI products from pre-market access to post-access, which realizes the comprehensive management of AI before, during and after the event. In the preparatory stage, AI is categorized into four categories based on the nature of its potential risks, and corresponding regulatory measures are formulated according to different application environments and risk levels; in the implementation stage, the function of the AI regulatory sandbox is highlighted. After the products are launched, system suppliers are required to conduct continuous after-sales monitoring of high-risk products and report any failure information to the national regulator in a timely manner. The U.S. and the U.K., on the other hand, mainly focus on the regulation of AI technologies in specific application scenarios, and are more inclined to after-the-fact and result-based regulation, emphasizing enhanced privacy protection, elimination of discrimination in areas such as justice and healthcare caused by the misuse of AI, safeguarding the legitimate rights and interests of consumers and strengthening the protection of workers.

3.3. Regulatory Paths: Synergy or Decentralization

The EU regulatory system exhibits a dual character. At the coordination level, the European Commission, the European Parliament, and the European Council join hands in the legal and policy formulation of AI regulation; at the implementation level, the EU and its member states have set up multiple levels of executive agencies, and established the High-Level Expert Group on Artificial Intelligence (HLEGAI), the Artificial Intelligence Alliance (AIA), and so on, to give full play to the roles of the organizations and associations. The U.S. federal system of government and its political system of separation of powers determines that the path of AI regulation in the U.S. is also trinity, with the legislative, executive and judicial playing a regulatory role in their respective spheres of competence. At the legislative level, the U.S. has not formulated relevant bills from the federal level, but the U.S. state government has formulated regulatory legislation. At the administrative level, the U.S. executive branch has the responsibility for setting regulatory policy and enforcing regulatory requirements. At the judicial level, the US courts have made AI risk subjects liable by way of judgment. The UK, based on its vision of maintaining a leading position in the global development of AI technology, tends to rely on existing institutions to regulate, adopting the principle of decentralized regulation, and its regulatory content is scattered in other laws and regulations.

3.4. Regulatory Commonalities

3.4.1 Tightening and “hardening” of AI regulatory policies

The introduction of the EU’s Artificial Intelligence Act has laid the legal basis for the global regulation of artificial intelligence, and with the rapid development of artificial intelligence technology, the public’s concern about the national security crisis that may be brought about by artificial intelligence technology continues to increase, the United States and the United Kingdom are also transforming the attitude of lax regulation of artificial intelligence, shifting to a more emphasis on industrial development and technological innovation in the past to give equal importance to both regulation and development. The regulatory measures have also shifted from emphasizing self-monitoring and commitment to regulation to realizing regulation through more frequent policies and more “hard” measures.

3.4.2 Strengthening international interaction and cooperation and consultation while focusing on “sovereign AI”

The United States and the United Kingdom and other countries are actively speaking out in the international arena and forming alliances and coalitions to seize the right to speak on AI. For example, the United States jointly issued an agreement with 17 countries to ensure the safety of artificial intelligence in the process of development and deployment in November 2023, and 30 countries signed a declaration of reasonable restrictions on military artificial intelligence at the same time. The UK hosted the first AI Safety Summit to establish itself as an important contributor to future

international cooperation. In the development of AI technology, countries are also actively carrying out data training models in line with their own culture and way of thinking, in order to form localized products.

3.4.3 Focus on the balance between regulation and industrial development

Europe, the United States and the United Kingdom have also emphasized the promotion of industrial development while formulating AI regulatory initiatives. The EU's Artificial Intelligence Act emphasizes "regulation as the main focus, taking into account the promotion", and strives to create a more friendly regulatory environment for industrial innovation and development and small and medium-sized enterprises (SMEs). Compared with the EU, the regulatory policy of the United States is more lenient, and it does not regulate all AI in a risk-graded manner as the EU does, but focuses on data privacy protection, national defense security and algorithmic discrimination, and focuses on the development of AI technology. The UK's regulation of AI is more flexible, encouraging technological innovation and focusing more on ethical regulation in its regulatory direction.

4. Summary

As intelligence "emerges" and ethical challenges go hand in hand, how can governments embrace and embrace the AI era? This paper finds that when making policy choices about AI, the state has set dual policy objectives of development and regulation. At the same time, due to the large differences in the role of the government in technological innovation and the perception of technological risks, different countries will adopt different development policies and regulatory policies. From a policy perspective, this paper systematically combs through the development of AI regulatory measures in the EU, the U.S. and the U.K., and compares their distinctive practices in the setting of regulatory agencies, regulatory scope and regulatory path. It is found that the AI regulatory models of the EU, the US and the UK have their own characteristics, but there are regulatory commonalities and common trends.

The development of artificial intelligence technology in China started late but is developing rapidly. While promoting technological development, the safety and ethical issues involved in AI cannot be ignored. It is necessary to use AI technology to realize the reduction of production costs, improve production efficiency and stimulate the formation of new quality productivity, and it is also necessary to ensure that the development of technology does not produce factors that jeopardize national security and social stability through effective supervision and governance means, and to safeguard China's scientific and technological security.

4.1. Establish an Artificial Intelligence Management Organization and Improve the Regulatory Policy System

The ability and level of regulation of artificial intelligence is a key factor in supporting the right to make rules and the right to speak, so the United States, the United Kingdom, and the European Union have proposed to set up their own artificial intelligence regulatory agencies. China should also set up a specialized AI regulatory and governance agency, formulate laws and regulations and regulatory measures, coordinate AI regulation, and continuously improve the regulatory policy system.

4.2. Actively Participate in International Cooperation

China's AI development level is currently in a leading position globally, and its development is based on the fact that no standardized and unified regulatory standards have yet been formed in the international arena. The United States and the European Union are stepping up their planning, and once the formation of standards contrary to China's sense of AI development, it will greatly impede and restrict the space for the further development of China's AI technology. Therefore, China should actively participate in international cooperation and the establishment of international alliances to

expand the influence of China's AI in the international arena, participate in or even dominate the formulation of international AI regulatory frameworks and measures, and strive to grasp the right to formulate industry regulatory standards and the right to speak.

4.3. Strengthen Research and Evaluation, Focus on the Balance Between Industrial Innovation and Regulatory Control

The concept of equal emphasis on development and safety should be upheld in the technology and scenarios of AI, and the paths of flexible governance and judicial precedence should be strengthened to avoid the formation of excessive deterrence. Let the market prioritize the evolution or development of the formation of rules, and subsequently assist the mandatory rules when the market fails. This can be done by fostering the development of a specialized think tank force to track the risks and innovation and development needs of AI technology applications in real time, cyclically assessing the regulatory status and effectiveness, and continuously optimizing the regulatory system and measures. While predicting and evaluating the risks associated with the technology, it will stimulate the innovation vitality of AI technology to drive the digital economy and the real economy, and continue to promote the high-quality development of China's science and technology industry.

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