Academic Journal of Management and Social Sciences
ISSN: 2958-4396 | Vol. 5, No. 3, 2023

Legal Risks and Responses to Artificial Intelligence Technology from the Perspective of Sociology of Technology

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Abstract: Due to the wide application of Artificial Intelligence (AI), it is reconstructing the rules, behavior, and the way of organization and operation in the economy and society. However, AI has also brought many potential risks while promoting high-quality economic growth and achieving effective social governance. AI has powerful intelligent thinking and behavioral decision-making ability. Therefore, there would be huge risks once safety problems related to AI occur. Although all countries are aware of the necessity of strengthening the regulation of AI, the regulatory system and governance concepts in practice are still not sophisticated enough to cope with the rapid progress of AI technology. In this paper, from the perspective of the sociology of technology, we analyze the development boundaries and legal limits of AI technology, and further explore the governance of science and technology ethics, aiming to build an AI that meets human expectations and promotes human well-being.

Keywords: Technological Society; Artificial Intelligence; Legal Risks.

1. Introduction

Artificial Intelligence (AI) is a theory, method, technology, and application system that uses digital computers or machines controlled by digital computers to simulate, extend, and expand human intelligence, perceive the environment, acquire knowledge, and use the knowledge to obtain the best results [1]. Nowadays, with the surging development of technology, AI has become one of the most innovative technologies. With the rapid development of the Internet, big data, and AI, the integrated upgrading of the intelligent Internet has profoundly shaped and changed the current society, promoting a comprehensive reform and innovation in the economic structure, industrial model and management concept. Taking the data of China's AI industry as an example, except in 2022, when the growth rate of AI business revenue declined due to COVID-19, the market scale from 2017 to 2023 showed steady growth (Figure 1). However, while AI has brought great advantages to human beings, it is also accompanied by a lot of risks. We should keep a close eye on the changes that are occurring, and carry out an effective risk prevention and control and rule of law response.

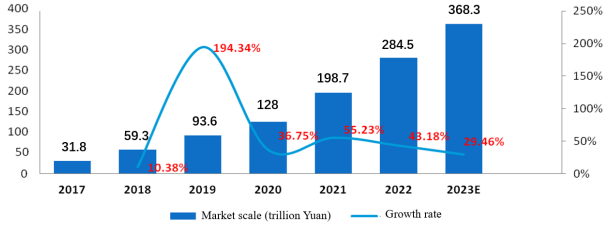

Figure 1. China's AI Industry Market Size and Forecast, 2017-2023 [2]

2. Basic Characteristics of AI Technology

2.1. Adaptiveness

In the field of AI, learning ability is achieved through machine learning algorithms, enabling machines to extract useful information from large amounts of data and further use the information to optimize their performance. Adaptiveness is the ability of a machine to self-adjust and adapt according to changes in the environment. In the field of AI, adaptiveness is an important part of machine learning algorithms. It could enable machines to self-adjust their strategies to adapt to new environments and situations according to historical data and experience. In addition, AI technology is able to apply knowledge learned from historical data to new data, which is a key part of machine learning algorithms. Such an ability could enable machines to learn generalized laws and patterns from historical data and further apply them to new data.[3]

2.2. Interpretability and Scalability

AI technology is a technology to simulate human intelligence with the aim of achieving autonomous decision-making, learning and execution capabilities of machines. Interpretability means that the decisions made by the machine could be explained. As we often need to understand the reasons why the machine makes a certain decision, the enhancement of interpretability could be realized through several ways, such as visualization, explanatory algorithms, etc. Scalability refers to the ability to deal with large-scale data of the machine. Scalability could enable the machine to deal with large-scale datasets, so as to get more accurate results.

2.3. Wide Range of Application Areas

AI technology has a wide range of application areas, such as machine learning, deep learning, natural language processing, computer vision, etc. These areas aim to simulate human perception, cognition and behavioral ability. For example, speech recognition technology could convert human speech into text. Besides, natural language processing technology could understand the meaning and context of human language. These technologies could be applied into various areas such as intelligent customer service, smart homes, and autonomous driving. Moreover, computer vision technology refers to enabling machines to understand images and videos like humans. This technology could be applied to

fields such as face recognition, image classification, target detection, medical image analysis, industrial automation inspection, etc. Intelligent recommendation is to recommend relevant content and products based on user interest and behavior by utilizing AI technology. This kind of recommendation could be applied to the fields such as e-commerce, video websites, music platforms, etc., so as to improve the user experience and commercial conversion rate.

3. Legal Risks of AI Technology from the Perspective of Sociology of Technology

3.1. Privacy and Data Protection Risks

With the wide application of AI technology, the issues of personal privacy and data protection are becoming more and more prominent. AI technology requires a large amount of data support. Meanwhile, there may be a risk of privacy leakage during the collection, storage and use of data. In addition, AI technology may also be used for surveillance, manipulation or misuse in violation of individual rights. An AI system is essentially an input-output process, including system development and design, data input, algorithmic computing and decision-making, and algorithmic decision-making result output and application, etc. Any defects in each link could trigger system risks. The potential risks in each link are specifically summarized in Fig. 2. Therefore, enterprises and governments need to strengthen the formulation and implementation of data protection and privacy policies to ensure the security and confidentiality of personal information [4].

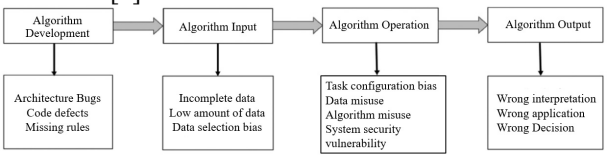

Figure 2. Potential risks of each link in AI technology [5]

3.2. Intellectual Property Risks

The development of AI technology involves intellectual property rights. AI technology and its application results could apply for intellectual property protection such as patents and trademarks. However, due to the complexity and interdisciplinarity of AI technology, there are disputes over the attribution of intellectual property rights and the right to use them. In addition, misappropriation of others' patents and trademarks or unauthorized use of others' results may also trigger intellectual property risks. Therefore, enterprises and research institutions need to strengthen the protection and management of intellectual property rights to ensure that their interests are not infringed [6].

3.3. Network Security Risks

The application of AI technology also involves network security issues. Hackers may utilize AI technology to carry out cyberattacks and malware development. In addition, cybercrime may use AI technology for fraud, theft and other behaviors. Therefore, enterprises and governments need to strengthen cybersecurity management and preventive measures to ensure the security and stability of network systems [7].

3.4. Moral and Ethical Risks

The development of AI technology also involves moral and ethical issues. AI technology could be used to make decisions and execute tasks, but may cause moral and ethical issues. For example, AI technology may replace human jobs and lead to unemployment problems. Besides, AI technology may have problems such as bias and discrimination while making decisions. Therefore, enterprises and governments need to strengthen the formulation and implementation of moral and ethical standards in the R&D and application of AI technologies to ensure that the technologies are used legally, fairly and equitably [8].

3.5. Legal and Compliance Risks

The development of AI technology also involves legal and compliance issues. Laws and regulations in all countries have different provisions and restrictions on the application of AI technology. Enterprises and governments need to carry out R&D and application of AI technology in compliance with local laws and regulations. In addition, if they violate laws and regulations or regulatory requirements, they may face fines, lawsuits, or other legal consequences. Therefore, enterprises and governments need to strengthen the assessment and management of legal and compliance risks to ensure the legal and compliant use of technologies.

4. Response Strategies for Legal Risk of AI Technology from the Perspective of Sociology of Technology

4.1. Improving Relevant Laws and Regulations

In recent years, China has successively issued relevant provisions, such as *the* Provisions *on the Ecological Governance of Network Information Conte*nt [9], *Administrative Regulations on Network Data Security (Draft for Opinion)* [10], the *Provisions on the Administration of Algorithm Recommendation of Internet Information Services* [11], and *the Provisions on the Administration of Depth Synthesis of Internet-based Information Services (Draft for Opinion)* [12]. However, with the rapid development of AI technology, it is difficult for traditional laws and regulations to keep up with the pace of technological progress, thus causing the risk of lagging laws and regulations. To cope with such a risk, the government needs to accelerate the formulation and improvement of AI-related laws and regulations to ensure the legitimate use and standardized development of AI technology. Related laws and regulations should clarify issues related to AI technology, including using scope, the division of responsibility, and privacy protection. The formulation of laws and regulations should take into account the actual situation of the development of AI technology. At the same time, the interests and rights of the public should be protected to ensure the legal, fair and equitable use of AI technology.

4.2. Formulating Ethical Guidelines

The application of AI technology requires the support of a large amount of data. Nevertheless, there may be a risk of privacy leakage during the collection, storage and use of data. In order to protect personal privacy and data security, on the one hand, the government needs to strengthen the formulation and implementation of laws and regulations on data protection. On the other hand, enterprises are required to comply with the relevant regulations during the collection,

storage and use of data. Moreover, enterprises and scientific research institutions need to formulate corresponding ethical guidelines and regulations to ensure the moral and ethical standards of the technology. The ethical guidelines should include the use scope, the decision-making process, and the fairness of the results of AI technology. Meanwhile, it is necessary to clarify the division of responsibility and the regulatory mechanism to ensure the legal and compliant use of technology [13].

4.3. Strengthening Technical Risk Management

There are regulatory risks in the R&D and application of AI technology, such as loss control and abuse of AI technology. In order to ensure the security and reliability of AI technology, the government needs to strengthen the regulation and management of R&D and application of AI technology. Regulation should include technology testing and quality assessment to ensure the safety and stability of the technology. At the same time, the government also needs to establish a reporting and complaint mechanism, and set up a thorough and sound technology risk management system to timely discover and deal with loss control and abuse of AI technology, and to comprehensively assess and manage the risks of AI technology. Besides, the risk response measures and contingency plans should be clarified so as to minimize the technological risks.

4.4. Enhancing Transparency and Fairness of Algorithms

The decision-making process of AI technology may be opaque and unfair, thus triggering the risk of transparency and fairness of algorithms. In order to ensure the legitimate use and fairness of AI technology, the government needs to formulate corresponding laws and regulations, requiring enterprises or organizations to disclose information such as algorithmic principles and decision-making processes when using AI technology, so that the public could supervise and review them. At the same time, during the process of applying AI technology, enterprises and the government need to disclose and publicize relevant information in accordance with the requirements of laws and regulations and ethical guidelines. The disclosure of information should include the purpose of using AI technology, the decision-making process, and the fairness of the results, etc. The time and frequency of disclosure should be clearly defined to ensure the authenticity and accuracy of the information. In addition, enterprises and research institutions need to strengthen the protection and management of intellectual property rights to ensure that their interests are not infringed. Intellectual property protection should include patents, trademarks, copyrights, etc. At the same time, it is necessary to clarify the attribution and the rights to use intellectual property to avoid intellectual property disputes.

4.5. Guiding Public Participation and Conducting Education

In order to improve the cognition and understanding of the public on AI technology, the government and enterprises need to strengthen public participation and education. Public participation should include policy formulation, technology evaluation, etc. Meanwhile, it is necessary to clarify the ways and procedures for the public to participate to ensure that the public's opinions are fully expressed and respected. Education should include the principles, scope of application, and risks of AI technology to improve the public's scientific and technological literacy and risk awareness.

4.6. Conducting Collaborative Management and Strengthening Prevention

The development and application of AI technology involves various sectors and fields, such as science and technology, economy, and society. Cooperation and collaborative management across sectors are crucial for the healthy development of AI technology. In order to address the risk of cooperation and collaborative management across different sectors, the government needs to establish a cross-sectoral cooperation mechanism and a collaborative management platform to promote communication and cooperation among various sectors and jointly promote the sustainable development of AI technology. In addition, various accidents or emergencies may occur during the application of AI technology. In order to deal with these risks, the government and enterprises need to formulate prevention measures and contingency plans. With the aim of ensuring the safety and stability of the technology, prevention measures should include technical safety and protection, data backup and recovery, etc. Contingency plans should include specific measures and procedures for dealing with unforeseen events to ensure that they could be quickly responded to and effectively dealt with [14].

5. Conclusion

In summary, AI technology is a double-edged sword while its security is the basic guarantee and requirement. Only through full introspection on the relationship between AI and people, strengthening the research on AI safety, legal governance, and policy governance, as well as strengthening the supervision of AI safety, can we ensure the safety of AI technology and its applications, and promote the science and technology to be upright, positive, and healthy.

References

[1] Guenter K. The Governance of Big Data and Artificial Intelligence in Network Industries[J].Competition and Regulation in Network Industries,2023,24(2-3):57-71.

[2] Information on: https://www. shangyexinzhi. com/ article/ 5655246. html.

[3] Zhang Mengran AI systems have developed human like brain features [N]. Science and Technology Daily, 2023-11-21(004). DOI: 10.28502/n.cnki.nkjrb.2023.006605.

[4] Rebekka S ,Irina B ,Jürgen B , et al.Using artificial intelligence (AI)? Risk and opportunity perception of AI predict people's willingness to use AI[J].Journal of Risk Research,2023, 26(10): 1053-1084.

[5] Tang Yaojia, Tang Chunhui. Risk based artificial intelligence regulatory governance [J]. Journal of Social Sciences, 2022, (01): 114-124+209.

[6] Chen Jie Research on Intellectual Property Issues in AI Performance [J]. Intellectual Property, 2023, (07): 56-75.

[7] A A N ,C M H ,A C F , et al.Not in my AI: Moral engagement and disengagement in health care AI development.[J].Pacific Symposium on Biocomputing. Pacific Symposium on Biocomputing,2023,28496-506.

[8] Miriam W. Foreword: Advancements and challenges for Latin American AI and data governance[J].Computer Law Security

Review: The International Journal of Technology Law and Practice,2022,47.

[9] Information on: https://www.gov.cn/zhengce/zhengceku/2020-11/ 25/content_5564110.htm.

[10] Information on: http://www.cac.gov.cn/2021-11/14/ c_1638 501991577898.htm.

[11] Information on: https://www.gov.cn/zhengce/2022-11/26/ content_5728941.htm.

[12] Information on: https://www.gov.cn/zhengce/zhengceku/2022-12/12/content_5731431.htm.

[13] Ameena E, Tessa C .AI Governance Strategic Planning: How We Do It[J].Journal of the American College of Radiology : JACR,2023,20(9):825-827.

[14] Mark N ,John Z .Algorithms, data, and platforms: the diverse challenges of governing AI[J].Journal of European Public Policy,2022,29(11):1753-1778.