

Development and Reform of Public Policy in the Era of Artificial Intelligence

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Abstract. After the development over half a century, artificial intelligence (AI) has been increasingly applied in the field of Internet and big data technology, and has been growing in leaps and bounds. With the advent of the era of AI, the rise of AI is not only a major development in the field of technology or industry, but also a fundamental and comprehensive reform in the economic, social and political fields. The resulting governance challenges require the reconstruction and innovation of the public policy framework. This paper studies the development and reform of public policy in the era of AI and puts forward relevant suggestions, providing a broader development platform for public policy in the era of AI.

Keywords: Public Policy; Artificial Intelligence; Development and Reform.

1. Introduction

Starting from the Dartmouth Conference in 1956, AI has experienced three waves of development in its history of more than 60 years. In 2012, Geoff Hinton, the “father of neural network” and professor of the University of Toronto, published a landmark article in the field of machine learning[1], which was the prelude to the third wave of AI research and application. With the continuous improvement of computer computing capacity and the rapid growth of data volume, AI has been greatly improved in performance, and has gradually been widely applied in different fields. The third development wave of AI that has lasted until present has brought great success at the technical and commercial level, however, the global attention it has attracted in the field of public policy is also an important characteristic of this wave of development, distinguishing it from the development waves in any other periods in history.

China attaches great importance to AI technology. With the successive introduction of the strategic plans of AI, the development of AI will certainly continue to improve in the future and eventually rise to a new level. In the context of rapid development of artificial intelligence, reform is required for public policy. How to make new choices for public policy in the current era of AI has received extensive public attention. Public policy refers to the normative rules and regulations formulated by the public sectors in order to realize and satisfy the interests of the general public, which can adapt to social development and benefit the people. A positive public policy beneficial to the people can enhance the credibility of the public sectors and alleviate social contradictions, thus making society more harmonious, whereas a negative public policy will not benefit the people, and will further intensify and escalate social contradictions and misunderstandings. In the era of artificial intelligence, how to formulate public policy to benefit the people is an important topic at present.

2. Overview of AI Technology

Despite that AI technology has been developed for a long time, its ideas and concepts are constantly changing, thus its development direction is also changing accordingly. Therefore, it is still an emerging technology in the current times, and it is the main research content in computer science. At the present stage, the main direction of research is to enable machines without subject thinking to imitate human thinking patterns, making them reach the level of human thinking, and even reaching a level beyond human intelligence.[2] A large number of tools have been developed in AI to solve the most difficult problems in computer science, such as the current artificial neural network, which is inspired by the neuron structure of the human brain. As shown in the figure below, a neural network is a group of interconnected nodes, which is similar to the huge neural network in the human brain.

After these networks are created manually, the parameters can be updated with gradient descent, which will promote the development of artificial intelligence.

In recent years, the world has attached great importance to the development of AI technology, especially in autonomous driving, face recognition, etc., and the application of AI in other fields is also increasing. With the continuous development of artificial intelligence, some scholars in the industry have put forward the view that the development of AI should be restricted, believing that the overdevelopment of AI is likely to lead to the extinction of mankind. However, from another perspective, most scholars and politicians believe that AI technology should be better developed, which can bring more convenience to mankind and solve many social problems. At present, there are still different opinions about the advantages and disadvantages of AI technology, but it is undeniable that the era of AI has arrived, which will certainly bring great changes to many industries, thus more vibrant and dynamic public policies should be adopted.

3. Challenges Faced by Public Policy in the Era of AI

Unlike other disruptive technologies that are limited to a specific industry, AI is a universal technology that can support all industrial reforms. Hence it has a wide range of social spillover effects, which will bring profound changes in various fields including politics, economy, society, etc. and will also result in challenges in governance. Specifically, the challenges are mainly reflected in the following three aspects.

3.1 Challenge in the governance structure of public policy

It may be difficult for the traditional hierarchic governance structure to cope with the openness and uncertainty resulted from the rapid development of artificial intelligence. The reason why AI needs to be regulated is that it may become a source of public danger. For example, if problems appear after the popularization of automatic driving technology, it may lead to large-scale continuous injury. However, unlike the sources of public hazards in the 20th century such as aircraft, large dams, nuclear technology, etc., AI is extremely open in its development. Any programmer or company can develop and apply AI without any restrictions.[3] One reason is that the arrival of the Internet era has greatly reduced the production threshold based on code, and another reason is the development law of AI itself. As mentioned above, only large-scale data input can produce better machine learning results. Therefore, it has become an inevitable choice for most AI companies to open the platform (i.e. algorithm) in the form of open source, thus more people can make use of it in different scenarios and absorb more complete data to improve the algorithm itself. In addition, the openness of the production mode of AI is bound to cause uncertainty in development. In the absence of effective constraints or guidance, the development of AI is likely to go astray. In this new situation, the traditional hierarchical governance structure is obviously difficult to make an effective response. On the one hand, it is unlikely for the government to try to cover all aspects of prior supervision, and the open AI production network makes it almost impossible for regulators to find the objects of supervision. On the other hand, the authority structure from top to bottom cannot be transmitted to producers, and the aggravation of information asymmetry may also lead to negative regulatory behavior. One of the current challenges to governance is to adjust the governance structure and logic, and form an AI production model characterized by openness and uncertainty.

3.2 Challenge in the governance methods of public policy

The legal regulation system based on the causality of human behavior for a long time may not be applicable to the application environment dominated by algorithms and data. The value of AI does not lie in imitating human behavior, but in its ability to learn and make decisions independently. Therefore, AI technology cannot be simply understood as the expression of the will of its creator (human). Programmers only make learning rules, but it is the algorithm itself that make decisions based on large-scale data training, which has no direct causal relationship with the will of

programmers. In fact, it is just the reason why AlphaGo could defeat the champion in succession, but its designer is not a top go master. It is in this sense that we return to the concept of “technological subjectivity” mentioned by Foucault. In his view, “technology is not just a tool or a means to achieve the goal. [4] On the contrary, it is a political actor, and the means and the goal are inseparable”. In this regard, the legal regulation system that regulates human behavior through the long-term exploration of the causal relationship between behavior and consequences may fall into a dilemma: it is undoubtedly unconvincing to blame the designer for the infringement caused by artificial intelligence, while if AI is to blame, how can we determine the liability of a machine? Therefore, how to deal with the problem of public responsibility allocation brought by the technology subject with algorithms and data being the core is currently the second challenge to governance.

3.3 Challenge of public policy in balancing technological progress and employment security

For the new social issues aroused by the impact of the development of artificial intelligence, it is necessary to build a new governance system and develop new governance tools. The governance challenges caused by the development of AI are not only reflected in the maladjustment of the existing system, but also in the governance gaps faced by the new issues.

Taking the most concerned unemployment problem as an example, it is an undeniable fact that the extensive application of AI and robots has replaced manual labor in terms of technological possibilities. Journalists, stock market analysts, or even legal workers may be replaced by machines. In a world of “full automation”, the re-understanding of the relationship between labor and welfare security and reconstruction of the labor and welfare security system is one of the governance challenges requiring solution urgently. [5]

4. Reform and Development of Public Policy in the Era of Artificial Intelligence

At present, the development of AI technology is very rapid, which makes the public sectors face great challenges when formulating public policies. Considering the social governance system of the public sectors and AI technology, the following section will analyze the current situation of the development of AI technology and discuss how the public sector can make corresponding policy choices in the current era. This paper holds that public policy in the era of AI should be reformed and developed from three aspects: system innovation, rational application and coping with challenges(As shown in figure1).

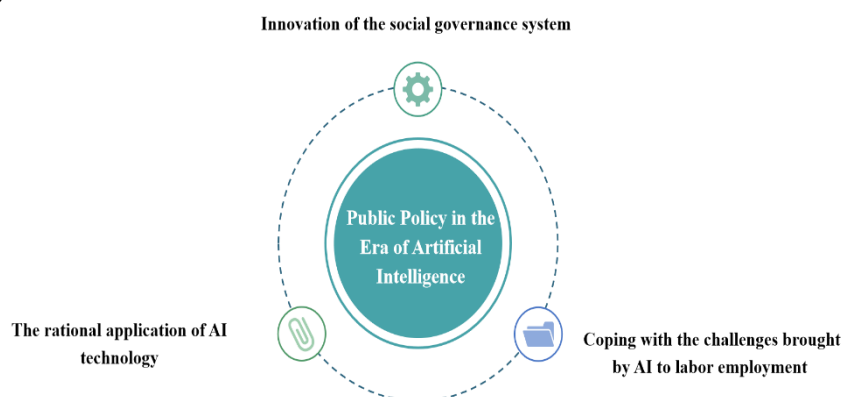


Figure 1. Reform and Development of Public Policy in the Era of Artificial Intelligence

4.1 Innovation of the social governance system

With the rapid development of AI technology, many social problems have been constantly emerging. On the one hand, AI technology is also a type of technology, which may face the risk of being used illegally. In addition, there are many information related to privacy and confidentiality in AI technology. If it is used indiscriminately, it will break the normal work order of relevant departments, and worsen social problems and contradictions, putting the society in an unstable

environment. On the other hand, in the new era of rapid development of artificial intelligence, social governance is far more difficult compared with the situation in the past. The wide application of various intelligent terminal devices and machines in the current society has changed social public opinions. Moreover, the public is more prone to ideological fluctuations in the current era, resulting in the turbulence of public opinions, which is a difficult problem for social governance [6].

In this context, public sectors should closely follow the development of AI to speed up the innovation and development of social governance systems in the era of artificial intelligence, allowing the social security system to develop with the progress of AI technology. Only in this way can people feel the warmth brought by the development of AI technology, thus the technology can be accepted by the vast majority of ordinary people. Public sectors should not only seriously consider the application of AI technology to solve the problems arising from current political and economic development, but also actively work to avoid them, predict the social contradictions that may be caused by artificial intelligence, and formulate public policies in advance to alleviate or avoid contradictions. Only by allowing the reform and development of public policy to be in line with the development of AI technology can make it serve the society and the public and benefit people while avoiding social problems and contradictions.

4.2 The rational application of AI technology

The current public policy should adapt to the development of AI technology, and alleviate the social problems brought by the development of AI technology. From the essence of development, AI technology should be able to maintain a close relationship with the development of public policy, thus the two can complement each other. In the new era of the development and expansion of AI technology, public sectors need to flexibly, reasonably and actively apply AI technology and explore ways and paths to make AI technology serve public policy, thus serving the masses of people. Public sectors can flexibly apply AI technology to formulate public policies, and in the meantime complete the evaluation and implementation of these policies, which will enable AI to share the pressure of staff to a large extent, improve the work efficiency of the public sectors, and rationally allocate human resources. In addition, it can also make the public policies more theoretical to a certain extent, thus they can be guaranteed and supported, and better serve the public for their social welfare under the guidance of the public sectors. In this way, AI technology can be supported and trusted by more people in the process of development, the credibility of technology can be improved, thus effectively promoting the rational reform and development of public policy.

4.3 Coping with the challenges brought by AI to labor employment

The development of AI can alleviate the impact of current aging on economic development in China to a certain extent. However, it should be noted that AI may cause unemployment problem and uneven income distribution to a certain extent and in a certain stage. How to solve these problems is the key to the orderly development of AI. It can be seen that AI will exert a certain impact on the income of vulnerable groups, and will have a greater impact on workers in low-skill jobs and elderly workers, which tends to cause the problem that the mismatch between labor force quality and future work skills [7].

Therefore, it is necessary for the public policy to deal with this problem and avoid the contradiction of social structural unemployment. In terms of public policy, in addition to supporting the development of AI, it is also necessary to limit the speed of its development to a certain degree, aiming to avoid the impact of AI technology on the labor market in a short time. Public sectors need to timely provide social protection and tax & welfare systems for the people through public policies, thus the employment problem can be alleviated to a certain extent. When technology replaces labor, the social security system can promote the stable transition of the labor market, and it can also improve the employment rate. If the social security system does not meet the requirements, the market may be distorted, and the participation of the labor market will decline. It is more likely that low-income people will not be willing to work with laziness and live only on basic social security, and

the government will face the pressure of increasing expenditure. [8] Public sectors should be able to make full use of AI technology and constantly improve the social security system, thus AI can stimulate more creativity on employment and more workers can be absorbed by the labor market.

5. Conclusion

Artificial intelligence is not a pure technical problem, but a complex problem closely related to social governance and social security. The negative impact of the lack of planned artificial intelligence can cross all economic classes and national boundaries. Although public departments, enterprises, international organizations and other parties have made efforts in the field of artificial intelligence algorithms, the integration of artificial intelligence and public policy governance is still at an early stage of development. In the future, what kind of specific applications and corresponding improvement schemes will depend on the collaborative participation of all parties. The arrival of the era of AI is inevitable, which is the common choice of social science, politics, economy and culture, and also the prerequisite for the leaping development of human society. Public sectors should focus on the innovation of social management system to closely integrate AI technology with public policy, promoting the development of public policy to a more scientific and reasonable direction.

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