

# Analysis of Artificial Intelligence Monopoly Issue and Related Solutions

Bingding Wang\*

College of Art and Science, Boston University, Boston, 02215, United States

**Abstract.** The rapidly developed Artificial intelligence (AI) industry relies on data resources and is often controlled by some tech giants. Although the organizational monopoly in the AI industry is more efficient in text and image generation and transmission in a vast and generative digital market, it still has some problems. The monopoly will cause the issues, such as data and computing resources central control, unequal competition, user discrimination, and so on. This paper will conduct research on these monopoly problems, which not only make a pavement for further research on the academic field of AI but also provide more theoretical evidence for the solutions in regulating AI development in the future. The qualitative analysis will be used, and monopoly issues will be explored with the three aspects, including data monopoly, platform monopoly, and user monopoly, which will reflect the negative impacts of the monopoly in the competition of the AI industry and provide more available solutions for the issues. Especially in the new emerging AI industry, this research has practical significance for guiding an anti-monopoly competition market and maximizing the utilization and fair distribution of data and computing resources.

## 1 Introduction

Artificial intelligence (AI) is closely related to technological innovation and progress, which is based on large amounts of resources and data, and can provide high information exchange in social production and economic life. The development of AI is so important that it is highly connected with people's social lives, but there are still some problems in the AI industry because the important AI resources are concentrated in only a few companies, for example, large amounts of data, sophisticated hardware and software, high tech talents and so on. This situation possibly developed into a monopoly and caused lots of risks and challenges. With the development of the AI industry, AI plays a more important role and these problems are becoming more obvious. This research aims to explore the monopoly problems that the AI industry needs to face and help further explore more suggestions in the process of developing the AI industry continuously.

Korinek and Vipra pointed out that the AI industry has been monopolized by five big tech investment companies with different competitive products and respective product features, as shown in Table 1. According to Figure 1 from Korinek and Vipra's statistics, Google,

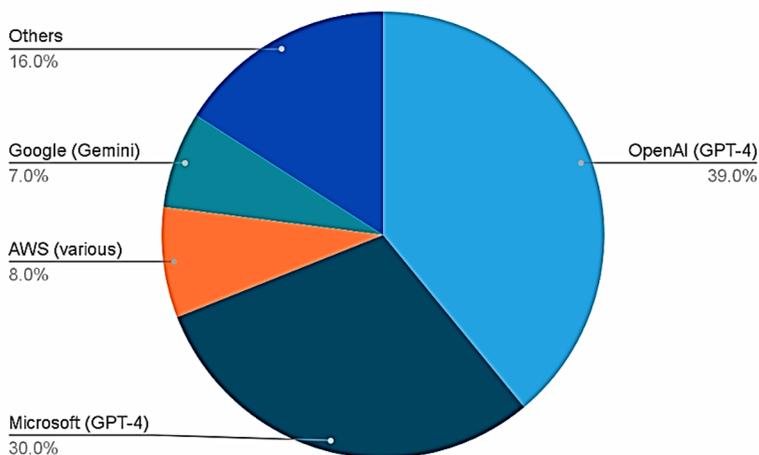
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\* Corresponding author: [frank233@bu.edu](mailto:frank233@bu.edu)

Open AI, AWS, and Microsoft company have already taken 84% share of the whole AI market, and the four largest companies dominate the market [1]. The monopoly makes a barrier for the other companies to enter into the market. AI not only involves infrastructure investment, such as cloud services and hardware but also relies on the data support for deep learning and large-scale computing. Take generative AI (such as ChatGPT) as an example, the company will take advantage of the user feedback to further improve their models, and more accurate and faster models will continue to attract users. Therefore, when the users rely on the usage of ChatGPT, there will be a large amount of data and information traffic, and the AI company has a natural monopoly characteristic to control the market, which seems an invisible hand in the AI foundation market [2]. This will become a risk when the company gains market dominance and implements exploitative behaviors, such as collecting excessive data, discriminating against users, and so on. According to Narechania's statement, the natural monopoly exists in machine learning, which will cause some risks in breaking the market discipline [3]. The monopoly will cause undemocratic behaviors and need more restrictions on data collection or algorithmic bias in the network market.

**Table 1.** The monopoly of companies in the AI industry.

Company	Product	Features
OpenAI	ChatGPT	Strong language generation capabilities
Google	Bard, PaLM and Notebook	Natural language understanding and search optimization
Microsoft	Major Investor in OpenAI and insert AI in Office	Integration of AI into productivity tools
Meta	LLaMA	Open-source generative model, reducing development costs
Anthropic	Claude	Focus on AI safety and reliability



**Fig. 1.** The Principal players in the market for generative AI models.

This paper will first explore and analyze the monopoly problems in the AI industry, including the resource and data monopoly, AI digital platform monopoly, and algorithm monopoly, because data, platforms, and algorithms are the basis of AI, and can help to analyze AI monopoly in a detailed and basic competition logic. Secondly, this paper will provide related solutions to the AI monopoly problems, which can help to reduce the exploitation caused by unfair competition and regular the AI industry in practice.

## **2 The AI monopoly issue in data, platform and Algorithm**

### **2.1 Data**

Data is the base of AI in the original resource, and through the interaction of various software and algorithms, the company can quickly obtain, analyze, and use massive real-time data for accurate information processing. The demands for data and computational resources are so large for model training and fighting against the other competitors, so it is difficult and expensive for new generative AI companies to develop in a monopoly situation. This is why those monopolized companies would like to provide their advanced technical products or services for free, which is the strategy for monopolizing data in the network not just for selling their products as gifts. With the control of the marketing ecology and dominating the data resource, the company will enhance its capital superiority and the dominant position. According to the research from Martens, google search has reached a market-dominant position with 90% of the users, and the lack of competition benefits Google because of the data-driven dominance but also brings some data abuse as negative impacts in social welfare [4]. The current market background is that open-source initiatives encouraging new players to enter the market and the growing trend of global competition. Although the market is highly concentrated, the most important aspect of AI technology is innovation. Open-source initiatives have led to a higher frequency of new model publications. New models can threaten and substitute current dominant models if they show high efficiency as well as low cost. According to Johnson and Sokol's statements, the author shows concerns about the security in the AI open-source models, the data needs a connection basis with the parameters and data index. When the number of model parameters increases beyond a certain threshold, the open source needs more transition improvement, which is not only the technological process of data but also related to the humanity and ethical fields [5]. However, there are some open-source initiatives like Meta's release of LLaMA that aims to provide help to developer who try to enter the industry. They lead to positive spillover effects. Open-source projects push technological innovation and reduce competitive pressure on small and medium enterprises. This benefits the AI industry's further development but at the same time open-source projects come with some drawbacks. The negative spillover effects cause technology abuse. Open-source projects have a high technical transparency. Therefore, it contributes the development of malicious AI models. These generative models maybe used to generate large-scale misinformation and fake content. This is harmful to public trust and social stability. Whether the large-scale training data or the number of model parameters could become useful or imperil, it needs more responsibility in the market, which is also the core driving force for improving the ability of large models of AI.

### **2.2 Platforms**

Platforms are the AI organizational foundation and provide the service to the different users in a digital ecosystem. Data and functions will be deployed and provided through digital platforms, and training data is obtained through digital platforms. Therefore, the platform is a new economic place for integrating companies and producing data, and in the platform the data and algorithm technology will be utilized with no limitation of time and space. This is an area for connecting various things and services, such as information, delivery, searching, bidding, social communication, and so on. The monopoly of digital platforms will strengthen the company's existing market positions with an upper level in aspects of ecology and technology. For example, in order to monopolize the market, several companies collude for a higher concentrated market to decide prices, and the collusion between the companies will reduce the threat from the potential competitors. Collusion has network effects and plays an

important role in optimizing AI monopoly models, and the integration of the data and algorithms also extends those top AI companies extend their market power to horizontal, vertical, and even hybrid markets. Therefore, the AI industry leaders collude with each other to enhance their network effects and further limit new competitors. According to the statements from Herrera-Cañedo, Jeffers, and Prager, the collusion of two firms will have the probability to contribute to the increase under the common leadership [6]. The generative AI industry is now more than just limited to the U.S., with new competitors emerging in the international market from other countries. Take China as an example, Deepseek has become a strong new competitor in the AI industry. There are many factors hinder the persistence of collusion. Collusion is not stable in environments where innovation is fast and relatively competitive, but monopoly may still exist. Monopoly will impede the development of this industry [7]. Therefore, the data ecosystem includes multilateral and different market players, and they are competitors and cooperators with offering, selling, user engaging, and data collecting. This is a channel to connect the virtual world of the AI industry to the outside world. The digital technology and business model will monopolize the data even though the platform is allowed to be used freely by the users.

### **2.3 Algorithm**

Algorithm is the core technology of artificial intelligence, and the algorithmic monopoly can lead to the abuse of AI because the individual user will be exploited for their data. It will happen in the bias and discrimination in the training data of artificial intelligence and cause the value orientation contrary to the public or good customs. The algorithm will also cause artificial intelligence play a leading role in information dissemination, which can be easily developed into automatic analysis with no human participation. The data-driven business models can quickly collect and analyze data, make decisions and react in a short period of time, track, predict, and influence platform users, and even assist users in decision-making or automatically output strategies. These technical advantages of the algorithm will guide people's mindset, and the algorithm has increasingly become an important influence factor in economic and social development and social life, and the problems will happen from the social and ethical level. Under the guidance of intelligent algorithm recommendation, users will be trapped in the information cocoon or fixed concept, this close to their own ideas or routine behavior, so the algorithm will repeat and strengthen their behavior with the algorithm monopoly. The manipulation of the algorithm will also control people's behavior or mindset, which will enable the users to follow the algorithm. The realization logic of algorithm monopoly is information dissemination which lies in the integration of virtual and real communication, it can push the users into the context of their personalized experience, and what the users see is what the algorithm wants them to see. According to statements from Zhang, the users' data have been used for big data analysis for more services and products selling and launching. The research shows that the regular customers in Amazon will be charged \$4 more for the same products than the new customers. In Tmall and Didi, if people buy some things frequently, they will be charged more [8]. These cases reflected that the abuse of algorithms ignores the users' dependence and make the users feel powerless to break through the circle. Within the algorithm monopoly background, the individual data is collected all the time and contributes to the models. AI monopoly will improve the accuracy and ability to get new rounds of exploitation of the users in the continuous interaction process.

### **3 Suggestions**

In order to prevent market monopolization, there are some solutions and policies made for a positive environment in the industry. Firstly, the data is the basic element and guarantee for

the AI industry. Secondly, the construction of data element infrastructure and market need to be promoted in the platform. Thirdly, in order to create the ideal competition rules for data, the law needs to ensure the rational distribution of data benefits on the basis of promoting data circulation. At the same time, clear legal rules should be formulated for some basic and intuitive behaviors, which can be used for prevention of the monopolistic behavior and unfair competition in the market.

According to the statements of Gladwin, control over data will regulate the AI monopoly and play a role in tackling AI monopoly issues. The data can empower the real economy and make the digital economy stronger [9]. It is of great significance to build trust in data applications. Regarding the AI platform, it needs to make the construction of the data market a new field of competition law enforcement. The traditional anti-monopoly theory and analysis paradigm based on the industrial economy are facing the challenge of effectiveness, so it should be flexibly adapted to the actual needs of competitive law enforcement in the data trading market. It is more urgent to further explore the possibility of the data itself constituting the relevant market, accurately define the scope of the relevant data market with a reasonable method, and analyze the competitive effect of the relevant data trading behavior on this basis. At the same time, the AI collusion could be solved by excessive market concentration. The government could provide support and innovation for the entry of small and medium-sized enterprises into the AI market. This will reduce the horizontal mergers and acquisitions between large firms, which cannot make the collusion restricted to limit the market share of a single firm. According to the statements from Cooper, innovation fostering and smaller players supporting can developed to make the competition fair [10]. To encourage new firms to enter the market, governments could provide subsidies or tax incentives. More competitors are beneficial to technological innovation. Open-source projects should also be encouraged by providing them with computing resources such as free cloud computing services, storage space, and GPU resources.

Furthermore, AI computing power is the main driving force in industrial development. The distribution of data and computing power is the core of AI governance, the use of the data unit, and the distribution of the computing power. The algorithm integrates the functions of resource mobilization and promotes circulation in the whole AI industry ecology system. The regulation forms the basis of data and promotes maximum utilization, so the algorithm should be used correctly and fairly. The external system regulation could be considered for supervision and interference with laws and policies, for example, to maximize public participation, to incentivize people to participate through revenue distribution, and so on.

## **4 Conclusion**

This paper has analyzed the AI monopoly situation mainly in data, platform, and algorithms with reaching the previous literature and works. With the exploration of the monopoly issues, this paper provides solutions that aim to solve the monopoly problems in data, platforms, and algorithms. It reveals that AI cannot be used as a capital-gathering tool for large tech companies but needs to be beneficial to all people. Fairness and anti-monopoly are important for establishing a new environment for the continuous development of the AI industry. The solutions in this paper call for people to pay attention to the AI monopoly problems and give a suggestion to urgently reconstruct and make good use of AI data, platforms, and algorithms. Under the guidance of the concept brought up in this paper, it needs to take more time to practice and see if the solutions are effective in the long term in establishing the anti-monopoly intelligent dynamic supervision.

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