**Algorithmic bureaucracy——Machine Learning in Justice System and Policing**

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Traditionally regarded as the computer field, algorithms, especially those of machine learning have gradually become the core of social and economic operation management. A large number of applications of algorithms have brought convenience, as well as difficulties to public sector governance, who needs to balance the obligation to protect citizens from potential algorithms and the temptation to improve its efficiency. This combination of Machine Learning and public governance is called algorithmic bureaucracy.

Bureaucracy is defined in the Oxford English Dictionary as: "a bureaucratic system managed by professional administrators in a conventional and organized manner according to clearly defined procedures." Weber bureaucracy (The organizational form with impersonal organizational management, an operation mechanism of handling affairs according to procedures, and a reasonable and legal personnel administrative system) is a formal form of organization of technical, scientific and rational rationality, and a means to overcome local decision-making and improve predictability and calculability within the country, It has become one of the symbols of the modernization of national governance. Over time, bureaucracy is gradually regarded as rigidity, stifling creativity, lack of humanity, slow response, causing customer dissatisfaction, delaying decision-making and limiting bureaucratic ability. In order to solve these problems, the new public management movement rose. On the one hand, the government designs strict performance appraisal procedures and standards, strengthens the political control of bureaucrats, and requires more and more indicators and standards in all fields of public management; On the other hand, by applying managerialism and market principles to the field of public administration, including outsourcing, competition, performance appraisal and incentive, we can improve the flexibility and responsiveness of bureaucracy. The era of algorithms has strengthened this trend. Big data advocates believe that bureaucratic control is not only possible, but also easier to achieve than ever through automated and computerized procedures. The dual pressure of fiscal austerity and the surge in demand for public services makes functionalists see the potential of new technologies. The public management method in the algorithm era is characterized by using information and communication technology to supervise or even replace the decision-making of traditional bureaucrats, so as to realize the multiple public values of public service supply, such as openness, fairness and efficiency. The algorithm consists of step-by-step processes or rules. It uses some type of data to provide some quantitative output. Algorithmic bureaucracy is a new combined social technology system. In this system environment, the algorithmic system based on artificial intelligence interacts directly with public administrators, organizational system conditions and other technical products, showing core abilities such as human intelligent perception, understanding, action and learning, automating administrative processes or assisting traditional bureaucrats to understand complex service environment, Processing government data, making administrative decisions, providing public services, etc. Algorithmic bureaucrats have many different names, such as algorithmic administration, screen bureaucrats, system bureaucrats, information bureaucrats, electronic bureaucrats, digital bureaucrats, street algorithms, computing agents, etc. this concept focuses on the impact of information technology (mainly artificial intelligence) on public management. At present, bureaucracy uses algorithms in different fields to systematize and standardize administrative operation processes, simplify the scale of bureaucracy and make decisions.

Although algorithmic bureaucracy occurs obvious efficiency and miraculous stability, the agency of external institutions will produce trade secrets and intentionally cause principal-agent problems.

Those problems could happens due to following reasons:

First, intentional opacity. Intentional opacity is based on business interests and trade secrets, that is, the company organization uses the logic of private business information to hide its algorithm information, and its goal is to protect the intellectual property rights of algorithm inventors. Even if the characteristics and operation of the algorithm are understandable, such as using simple artificial intelligence algorithms such as decision tree; However, due to proprietary property rights, these algorithms are still confidential in law, and trade secrets are the core obstacle to understanding automation authorities such as algorithms. In the freedom of Information Act (FOIA) of the United States and the general data protection regulation (GDPR) of the European Union, the exemption of trade secrets restricts the information access right of external supervision institutions. FOIA trade secret exemption "allows the federal government to reject the transparency request of any third-party software integrated into its system", and algorithm manufacturers propose trade secret protection to avoid disclosure obligations or refuse to participate in independent testing of algorithm performance. The public and commercial attributes of large network platform enterprises (such as Google, Facebook, Tencent and Alibaba) have been difficult to separate. Their data and resources are deeply embedded in people's daily life, and their algorithm ability far exceeds the regulatory ability and scope of a single local government or even a single country. In some countries, the public sector has actually sacrificed the ability to meaningfully supervise the operation and function of commercial institutions' algorithms for the sake of commercial interests, as well as the ability to require them to comply with their legal obligations of transparency and interpretation of decisions.

Second, agent malfeasance. The dereliction of duty of the agent (external organization), that is, when there is a conflict of interest between the principal and the agent, the agent chooses his own interests. Based on the interpretation of neoclassicism and new institutional economics, agents such as external commercial institutions may be selfish or opportunistic. When private entities contracted by the public sector participate in their design algorithms, agent malfeasance may occur. Due to legal restrictions, Uber is not allowed to operate in some cities, and some local governments have introduced measures to try to track its attempts to operate in prohibited places; This includes "phishing enforcement" operations, in which city officials try to use Uber's app to stop passengers to prove that the company's operations violate local laws, regulations or agreements. In retaliation, Uber employees have taken measures to identify public officials who may try to catch them through the manual identification and algorithm system; If someone tags a car, it can mobilize the "ghost" car in the fake version of their application, or show that no car can be summoned. If the driver finds anyone marked "gray ball", Uber may call the driver and instruct them to end the journey. Such algorithms are obviously deliberately constructed to deceive law makers and regulators.

Third, The insufficiency of client's supervision ability. The client's bureaucracy lacks the ability to supervise the algorithm bureaucracy. The legitimacy and discretion of bureaucrats are based on their professional knowledge. Since the new public management movement, countries have the impulse to reduce government costs and pay attention to competition, and reduce the posts of background technology developers, thus reducing the ability of the public sector to develop, maintain and purchase information technology. Therefore, the government may lack key skills and knowledge in the procurement process, and lack effective supervision ability for the algorithm system developed by external institutions. After the operation of algorithm bureaucrats, the result of over reliance on algorithm bureaucrats may further empty the professional knowledge and judgment of street bureaucrats, fall into a vicious circle of "diminishing professional ability", and reduce people's trust in the government. Flint, Michigan, used the research team of the University of Michigan to accurately identify and replace the lead pipe households under the condition of very tight time and funds. Although the accuracy rate was as high as 94%, due to the lack of professional ability of flint government officials, there was no way to explain why one family was a lead pipe and the other was not; Coupled with the statistical errors of type I and type II, residents do not believe the statements of local governments. Finally, in order to solve the problem of distrust, the government abandoned the algorithm bureaucrats to improve efficiency, and chose to excavate and replace the water pipes of all families. In fact, the process of public management is a process of multi value competition and balance. In many cases, the efficiency value advocated by technical rationality may not be important at all, or have to give way to other values.

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