Research on the Legal Regulation of Artificial Intelligence in Administrative Penalties

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Abstract: With the continuous development of science, technology, and artificial intelligence, artificial intelligence has gradually been applied in different fields, including the field of administrative law enforcement. This paper focuses on administrative penalty acts and explores the interactive application of artificial intelligence in administrative penalties. The introduction of artificial intelligence technology provides new ideas and methods for administrative penalties. Meanwhile, due to the particularity of artificial intelligence, certain problems also exist in its application. This paper discusses the problems of artificial intelligence in the field of administrative penalties from different application scenarios and explores future development paths, such as improving the legal regulatory system, enhancing the level of technical support, and constructing a multi-party collaborative supervision mechanism, with a view to accelerating the process of intelligent penalties and ultimately realizing the integration of artificial intelligence and administrative law enforcement.

Keywords: Artificial Intelligence; Administrative Penalties; Intelligent Application

1. Introduction

Artificial intelligence is a set of programs composed of algorithms and data structures, which can use algorithms and data to reach a reasonable conclusion. According to the degree of intelligence, artificial intelligence can be divided into the intelligent assistance stage and the fully intelligent stage [1]. At present, the intelligent development of artificial intelligence in the field of administrative law enforcement has reached a considerable level. In the intelligent assistance stage, artificial intelligence mainly functions as an auxiliary tool for administrative law enforcement, such as intelligent monitoring, facial recognition, and intelligent assisted case handling. In the fully intelligent stage, artificial intelligence is manifested in the independent operation of the entire process of administrative law enforcement. Administrative departments can pre-program applicable legal provisions and precedents, and artificial intelligence can automatically generate a complete set of administrative law enforcement procedures based on precedents and previous law enforcement documents. The application of artificial intelligence in the field of administrative penalties can help improve penalty efficiency and protect the rights and interests of administrative counterparts. However, due to the characteristics of artificial intelligence, certain problems may also arise. In view of this, on the basis of discussing the application and significance of artificial intelligence in the field of administrative penalties, this paper analyzes the problems existing in the intelligentization of administrative penalties and explores the development path of artificial intelligence in this field, so as to promote the two-way integration of administration according to law and artificial intelligence and realize the modern development of the rule of law.

2 Application Scenarios of Artificial Intelligence in Administrative Penalties

2.1 Intelligent Application of Discretionary Benchmarks for Administrative Penalties

In the stage of artificial intelligence assistance, administrative penalty authorities can rely on its powerful data processing capabilities to efficiently collect and process various types of information related to administrative penalty power. Unlike traditional big data technology based on original input, artificial intelligence focuses on output. Through in-depth data analysis, it generates practical intelligent results, helps law enforcement authorities build a

complete information system, and, through quantitative analysis, scientifically determines the applicable circumstances, types, and ranges of penalties for illegal acts, thereby realizing precise assessment and early warning. In addition, artificial intelligence can electronically integrate various discretionary standards for administrative penalties to form a unified, standardized, and easily searchable database. This helps law enforcement personnel quickly obtain corresponding standards and avoid improper discretion caused by human memory errors or inconsistent standards.

2.2 Intelligent Evidence Analysis System

At present, the most widely applied field of artificial intelligence is evidence analysis. An intelligent evidence analysis system realizes digital forensics, data analysis, and information retention through advanced technology. It can trace and analyze electronic evidence involved in cases, reduce the difficulty of evidence collection for law enforcement personnel, and improve case-handling efficiency. For example, in traffic law enforcement, intelligent snapshot systems use high-definition monitoring to record violations such as running red lights and speeding in real time, thereby fixing evidence of violations and changing the cumbersome traditional model of manual patrol and evidence collection. With technological development, intelligent evidence analysis systems will continuously optimize algorithmic models to adapt to complex scenarios and different types of cases. Meanwhile, by combining technologies such as blockchain and language processing, they will further improve the accuracy of evidence analysis.

2.3 Intelligent Assisted Decision-Making System

At the stage of administrative penalty decisions, artificial intelligence can improve the quality and efficiency of penalty decisions. Although current artificial intelligence does not yet possess deep learning capabilities, it can improve prediction accuracy by adjusting algorithmic parameters through repeated calculations. After law enforcement personnel input case information, the system can quickly provide penalty recommendations for reference by combining past cases, laws, and regulations. For example, the “Environmental Protection Administrative Penalty Discretionary Assisted Decision-Making System” once developed by the Nanjing Municipal Ecology and Environment Bureau compares algorithmic predictions with manual discretionary results and submits penalty conclusions to a review group or the director’s office meeting for approval according to the level of deviation, thereby ensuring fairness in penalties [2]. In addition, artificial intelligence can optimize algorithms according to the characteristics of different regions and fields. It is not affected by human emotions, fatigue, and other factors, and can maintain objective judgment standards, thereby enhancing the credibility and authority of administrative penalties.

3 Significance of Applying Artificial Intelligence to Administrative Penalties

3.1 Improving the Efficiency of Administrative Law Enforcement

Traditional administrative penalties require manual means for evidence collection. The use of artificial intelligence can realize intelligent recording and reduce the waste of personnel and time. The application of artificial intelligence can build an all-weather monitoring network and intelligent analysis model [3]. Through intelligent systems, evidence collection can be made intelligent, avoiding the process of manual collection and organization and greatly improving law enforcement efficiency.

3.2 Improving the Accuracy of Administrative Law Enforcement

Traditional law enforcement relies on the experience of law enforcement personnel to judge the nature and severity of cases, while intelligent law enforcement can analyze past cases through big data to assist in case characterization and even realize the quantification of penalties through algorithms. At the same time, artificial intelligence can warn against illegal acts through behavioral pattern analysis, prevent the occurrence of cases, and further improve the accuracy of law enforcement.

3.3 Protecting the Rights and Interests of Administrative Counterparts

The application of artificial intelligence in administrative penalties is conducive to protecting the rights and interests of administrative counterparts. On the one hand,

intelligent systems operate based on objective data and preset rules, which can standardize law enforcement procedures, reduce human interference, and make penalty decisions more objective and fair. On the other hand, with the help of artificial intelligence systems, law enforcement authorities can promptly disclose information such as the basis and evidence for penalties. The discretionary standards automatically extracted by the system are also convenient for administrative counterparts to make defenses, effectively protecting their legitimate rights and interests, such as the right to know and the right to make statements and defenses.

4. Analysis of Problems in the Application of Artificial Intelligence to Administrative Penalties

4.1 Difficulties in Defining Legal Attributes and Responsibilities

At present, the legal subject status of artificial intelligence remains unclear. Artificial intelligence is different from natural persons and legal persons; in essence, it is a technical tool that operates based on algorithms and data. If an administrative penalty made with the support of an intelligent assistance system contains errors, it is difficult to clearly allocate responsibility. Developers, administrative organs, and other relevant subjects may easily shift responsibility to one another. For example, developers may evade responsibility on the grounds that they cannot control actual application scenarios and dynamic data, while administrative organs may argue that they merely relied on the intelligent system for reference in decision-making and had no subjective fault. The ambiguity in the legal subject status directly leads to confusion in the attribution of responsibility, making it difficult to pursue liability accurately. At the same time, administrative penalties involving artificial intelligence concern multiple subjects, including data suppliers, algorithm developers, operation and maintenance providers, administrative users, and industry regulators. Under this multi-link collaborative model, the boundaries of rights and responsibilities are unclear. Since all participating subjects may affect the penalty result, disputes can easily lead to mutual shifting of responsibility, greatly increasing the difficulty of responsibility identification and accountability.

4.2 Algorithmic Black Box and Transparency Issues

Artificial intelligence technology essentially establishes a cognitive paradigm based on massive data mining, in which data has absolute priority [4]. However, artificial intelligence decision-making involves the complex and hidden problem of the “algorithmic black box.” It is difficult for law enforcement personnel and administrative counterparts to clearly understand the adjudicative basis and internal logic of administrative penalty algorithms. Taking an automated penalty-measurement system based on deep learning as an example, such a system can generate penalty opinions according to the facts of violations, but the reasons for its decisions cannot be traced or examined. This may easily cause administrative counterparts to question the rationality and fairness of penalties and may violate the principle of due process in administrative penalties. In addition, algorithm developers usually do not disclose algorithmic models, making external supervision difficult to carry out. Because the logic and calculation process of algorithm operation are not transparent, problems such as data bias and procedural loopholes cannot be effectively identified, which may easily result in unfair situations such as differential treatment and improper exercise of penalty discretion.

4.3 Data Quality and Privacy Risks

The application of artificial intelligence in the field of administrative penalties relies heavily on large amounts of data as support. However, various problems in data quality and privacy risks also bring corresponding challenges to administrative penalty work. On the one hand, data quality issues have a significant impact on the scientific nature of penalty decisions. In practical application, data may be inaccurate, resulting in penalty outcomes that seriously deviate from actual circumstances. On the other hand, in the process of collecting and using data concerning administrative counterparts, there is a high risk of infringing personal privacy, which poses challenges to existing data protection and privacy regulations. Administrative penalties often involve a large amount of sensitive personal information, such as personal identity information, health status, and consumption records. When such data circulates and is used among different departments and systems, it can

easily be leaked if strict security protection measures and standardized management procedures are lacking.

Meanwhile, when processing and analyzing data, the algorithms of artificial intelligence systems may mine more in-depth personal information through association, integration, and other methods. If the use and sharing of such information are not explicitly authorized by the parties concerned, it also constitutes an infringement of privacy.

4.4 Broad Discretion in Administrative Penalties

The levels of economic and market development vary across different regions in China, and local discretionary benchmarks also differ, making it difficult to unify discretionary standards for administrative penalties. At the regional level, areas with different levels of economic development may apply differentiated discretionary standards to the same type of illegal act. At the industry level, differences in discretion also exist. For high-tech industries, penalties for intellectual property violations tend to emphasize rectification and guidance, while in traditional manufacturing industries, supervision and penalty measures are stricter because they focus on product quality and safety. Artificial intelligence can only rely on discretionary rules preset by humans and make mechanical either-or judgments on the circumstances of individual cases during operation. It cannot conduct specific analysis by taking into account the differences among different regions and fields, which may easily trigger an internal conflict between the high degree of uniformity in discretionary results and substantive justice in individual cases [5]. The differentiated realities of regions and industries expand the floating space of administrative penalty discretion and also constitute a practical obstacle to the implementation of artificial intelligence in the field of administrative penalties. This requires intelligent law enforcement systems to comprehensively consider diverse and complex factors, so as to ensure the scientific nature, rationality, and fairness of administrative penalties.

5. Development Path for the Application of Artificial Intelligence to Administrative Penalties

5.1 Improving the Legal Regulatory System

5.1.1 Clarifying the legal status and responsibility rules of artificial intelligence

On the one hand, the legal status of artificial intelligence should be determined. It should be clarified whether artificial intelligence serves as a tool to assist law enforcement personnel in administrative penalty work, or whether it has a certain independent status and can autonomously make some penalty decisions. For example, in the application scenarios of some automated penalty-measurement systems, the system provides penalty recommendations based on preset algorithms and input data. In this case, its function is more inclined toward that of an auxiliary tool. However, with technological development, if more autonomous artificial intelligence participates in penalty decision-making, its status will need to be defined more clearly.

On the other hand, the corresponding principles and methods of responsibility assumption must also be clarified. When a penalty decision made based on the analysis and judgment of artificial intelligence contains errors, it is necessary to clearly distinguish who should bear responsibility. Should the developer of artificial intelligence be responsible because the algorithm it developed is defective or because it failed to fully consider actual application scenarios? Should the administrative organ using the artificial intelligence system bear responsibility because it failed to operate or review the system properly, or because it relied excessively on the system? Or should other relevant subjects bear corresponding consequences due to their fault? In such scenarios, it is more appropriate for the administrative organ to serve as the responsible subject. The reason is that holding developers of artificial intelligence liable is not conducive to encouraging the development of technological innovation, and accountability itself is somewhat difficult. Treating administrative organs as the subjects responsible for liability helps prevent law enforcement personnel from relying too heavily on artificial intelligence and thereby neglecting the improvement of law enforcement capabilities and the study of law enforcement knowledge.

5.1.2 Formulating procedural norms for the application of artificial intelligence

Procedures for algorithm disclosure and explanation should be regulated. Developers or users of artificial intelligence should be required

to disclose the key content of algorithms within a certain scope and be able to explain how algorithms generate penalty recommendations or decisions based on input data. In particular, when a penalty decision involving the rights and interests of administrative counterparts is made, the factors considered by the algorithm, the weight assigned to each factor, and the accuracy and scientific nature of the algorithm should be explained to the administrative counterpart, so that the counterpart can clearly understand the rationality of the penalty decision.

Procedures for generating and reviewing penalty decisions also need to be clearly regulated. Even with the assistance of artificial intelligence, the final penalty decision cannot be completely separated from manual review [6]. In the process of administrative penalties, major cases require legal review, and cases handled under general procedures require internal review. Whether in the traditional administrative penalty process or the intelligent administrative penalty process, manual review of cases is indispensable.

5.2 Improving the Level of Technical Support

5.2.1 Overcoming the algorithmic black box problem

The research and development of explainable artificial intelligence technology should be actively encouraged. By establishing explainable models or using model interpretation techniques, the importance of various factors in decision-making and the references for specific instances can be analyzed, helping to interpret the operation process of algorithms and gradually making algorithms transparent and visualized. The government may also require, through contractual agreements, cooperative enterprises to issue corresponding explanatory texts and verification files for their key decisions. On the basis of protecting the legitimate competitive rights and interests of technology contractors, the above records may be publicly discussed and explained [7]. At the same time, the construction of algorithm review and testing mechanisms should be strengthened. Review and testing methods for training data and algorithms should be continuously developed to ensure that algorithms do not contain discriminatory factors during operation and to avoid obviously unfair penalty recommendations for similar illegal acts committed by specific groups due to data bias and other reasons. Relying on the construction of technological due process, the transparency of automated decision-making rules should be promoted, the accountability mechanism should be improved, and system accuracy should be enhanced, so as to safeguard the legality and fairness of decisions [8].

5.2.2 Ensuring data quality and security

Strict standards should be established for data collection, organization, storage, and use. In the collection phase, comprehensive and representative datasets should be acquired and utilized, ensuring that all collected data are accurate and error-free. Furthermore, data collection must comply with legal procedures, obtain the consent of administrative counterparts, and be conducted within the scope of statutory authority. Any collection of data through improper means for use as a basis for administrative penalties must be strictly prohibited. Reference may be made to the provisions of the General Data Protection Regulation (GDPR) enacted by the European Union in 2016, which imposes strict limits on the use of facial recognition data collected by administrative authorities through AI technologies in law enforcement, and classifies such data as a "special category of personal data" subject to enhanced protection [9]. During the organization and storage stages, data should be categorized and integrated to ensure integrity and retrievability, and stored through secure and reliable means to prevent data loss or corruption. When using data, established rules and procedures must be strictly followed to ensure that data are used solely for legitimate and lawful analytical decision-making in administrative penalties.

5.3 Establishing a Multi-Party Collaborative Oversight Mechanism

To establish a multi-party collaborative oversight mechanism, internal supervision and checks within administrative agencies must be strengthened. Administrative agencies should periodically assess the application of artificial intelligence in administrative penalties, covering aspects such as compliance in data collection and usage, as well as application effectiveness. Comprehensive evaluation should be conducted through quantitative indicators and case studies. At the same time, a technical audit department should be set up to conduct regular inspections and rectify technical issues. Furthermore, the participation of external oversight forces should

be encouraged. Administrative agencies should maintain accessible reporting channels, encourage public oversight of the use of AI in administrative penalties, establish a scientific and reasonable mechanism for human intervention and appeal, promote the substantive development of human intervention mechanisms, and strictly adhere to the minimum standards of technical due process [10]. Qualified third-party evaluation institutions should be introduced to carry out independent oversight and assessment, and the supervisory role of judicial organs in administrative litigation and other proceedings should be leveraged to ensure the legality and rationality of AI-assisted law enforcement.

6. Conclusion

The application of artificial intelligence in administrative penalties is an important embodiment of the integration of technology and the rule of law. Although certain progress has been made and many advantages have been demonstrated, it still faces many severe challenges. In the future, it is necessary to improve the legal regulatory system, clarify its status and responsibilities, and regulate procedures; overcome the algorithmic black box and ensure data quality and security by improving the level of technical support; and realize internal supervision and checks and balances within administrative organs as well as the effective participation of external supervision forces by constructing a multi-party collaborative supervision mechanism. Only in this way can the positive role of artificial intelligence in administrative penalties be fully brought into play, administration according to law be advanced to a higher level, and the long-term goal of modernizing the rule of law be achieved.

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