Research Article

Administrative Punishment Supervision System Based on Internet of Things Driven by Big Data

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In order to study the administrative punishment supervision system based on the Internet of things driven by big data, firstly, based on the full collection of materials, this paper makes a detailed induction and analysis from the perspective of demonstration, and discusses the problems existing in the practice of administrative punishment. In terms of theory, first determine the concept of administrative punishment from the overall direction, and then locate it to administrative punishment. Then, it analyzes the specific contents of the construction of the supervision system based on the Internet of things driven by big data and the key technologies of the cloud platform system of the Internet of things. Finally, focusing on the judgment cases published by the municipal and county courts in a province from 2014 to 2017, the analysis results are displayed, discussed, and summarized. The results show that the construction of intelligent supervision system is realized, the intelligent response to supervision needs is completed, and the scientific and effective supervision is promoted.

1. Introduction

As one of the important state powers, administrative punishment plays an irreplaceable role in the operation of administrative power in China, which is closely related to the vital interests of citizens, legal persons, and other organizations. Administrative punishment is an important state power (Figure 1), which plays an important role in the operation of administrative power in China and is closely related to the vital interests of citizens, legal persons, and other organizations. Its establishment and application are related to the power allocation of various state organs and the reform of administrative institutions, as well as the coordination and rationality of the legal sanctions system. Due to the differences in tradition, economy, culture, politics, and law, the differences in legal tradition, cultural origin, political environment, and economic situation in western countries also lead to the differences in administrative punishment, showing different characteristics. The expression of administrative punishment in civil law and common law countries is also different. Administrative means an administrative position, noncombat administrative service. Civil law countries call it “administrative penalty,” that is, the sanctions given to the acts that violate the obligations stipulated in administrative law. “Administrative penalty” has different understandings in broad and narrow sense [1]. In a broad sense, administrative penalty refers to the legal sanctions against those who violate administrative obligations, including administrative penalty and order penalty. In a narrow sense, administrative punishment refers to the sanctions against the perpetrators who violate administrative obligations but have not yet constituted a crime. Its content limits all administrative punishments except administrative punishment. The system of administrative punishment is relatively developed in civil law countries including Germany, Austria, Japan, and Italy. The administrative punishment in Germany can be traced back to the police punishment. The federal system in Germany enables the States to enjoy a certain degree of national sovereignty and autonomy in a certain range of affairs. The division of authority among the States
also enables the States to enjoy unique jurisdiction over affairs, and other states cannot interfere [2].

China’s legal circles have different expressions on administrative punishment and the concept. The following statements have great influence: (1) Administrative punishment is “the sanctions given by the state administrative organ to those who violate administrative regulations. If only minor violations are not enough for criminal punishment, the punishment must be in accordance with the provisions of the law.” Therefore, administrative punishment can be summarized as a specific administrative act implemented by a specific administrative organ or other statutory organizations. What kind of organization can exercise the power of administrative punishment in what aspects is clearly authorized by legal norms, and not any administrative organ has the power of administrative punishment. Although administrative penalties are often implemented by individuals, the perpetrators are in the name of the organization rather than in the name of individuals. Administrative punishment is a kind of disciplinary action against the offender and a kind of administrative legal sanction. This kind of measure will punish the violator so that he will not repeat it in the future. Therefore, from the perspective of time continuity, it is often a one-time, unilateral expression of will of the administrative subject based on the administrative power, and cannot be mediated or negotiated [3]. With the deepening of judicial openness on the Internet in China, the information of judicial power operation can be obtained more conveniently, and the data we can store and process has reached an unprecedented level, which provides the original data for the analysis of legal big data. Apply a thorough revolution of the traditional sampling survey to the legal field, that is, legal workers use big data technology to extract, analyze, and summarize the information made public by the judiciary, so as to get the problems existing in the same type of judicial information at the current stage and the relationship between the information. The conclusion drawn in this way will be more comprehensive, accurate, and referential, and then analyze, summarize, and reflect on the problems, which is the due meaning of modern legal research [4].

On this basis, from the perspective of big data, this paper puts forward the idea of promoting the construction of grass-roots administrative law enforcement supervision platform and solving the problem of poor collection of administrative law enforcement information and incomplete mastery of supervision subjects. First, strengthen organizational leadership and break the interest “barrier” of data island; second, enrich data types and promote the use of law enforcement recorders and other equipment in the whole process; third, strengthen data sharing, explore the
application of blockchain technology in big data, prevent information from being tampered with, and implement a distributed administrative law enforcement data sharing and storage mode; fourth, strengthen clue sorting, give play to the role of artificial intelligence research and judgment of big data, and strengthen the analysis of the objects and facts involved; fifth, strengthen investigation and verification, and strengthen the docking of big data supervision platform with case file evaluation, discipline inspection and supervision, judicial supervision, public supervision, and other supervision methods [4].

2. Literature Review

In recent years, the works introducing foreign administrative supervision are shown in Figure 2, and more introduce the content of framework system construction from a political perspective. Ghanieri Rehman and others pointed out in the analysis on the failure of supervision behavior of government administrative departments under information asymmetry that the principal-agent relationship between government administrative departments and supervised units puts government administrative departments in an information inferior position, resulting in the failure of supervision [5]. Lomba, A. and others believe that generally speaking the efficiency of supervision depends on the quantity and quality of information. Some supervised units do not provide original information, or even deliberately provide information that conceals the truth, or provide changed information, resulting in information asymmetry. In addition, the functions of the administrative department check the paper documents afterwards and lack the way to search the information of the supervised object, which leads to the failure to find the loopholes and unreasonable behaviors in operation in time, which is bound to affect the accuracy and effectiveness of supervision [6]. Therefore, none and others proposed to build a flat administrative organization, reduce information filtering, and promote a faster understanding of the information of the supervised units; establish an effective information disclosure system for supervised units; and establish an effective incentive mechanism and punishment mechanism for immoral behavior [7]. Zhang, Y. and others pointed out in the analysis of anti-corruption strategies from the perspective of information asymmetry that since information asymmetry is common between supervision departments and supervised departments, discipline inspection and supervision departments are often in a passive situation because of the limited information they have for various reasons [8]. Jnr, B. A. and others pointed out in the research on information asymmetry in public policy implementation that before the 20th century, many regions and departments in China obtained and released relevant policy information through original communication [9]. In the book development and utilization of government information resources, Hosseini, B. and others summarized and studied the practices and deficiencies in the development, integration, openness, sharing, and value-added services of China’s government information resources, and believed that government information sharing is an important starting point for political democratization, building a service-oriented government and avoiding resource waste [10]. Alsaig, A. and others put forward in the book administrative information disclosure in Transitional China that anyone has the right to obtain any information other than the exclusions of organizations exercising public power, and its right basis is the right to know based on the nature of freedom and social rights. The democratization of administrative power is the basic power basis of the administrative information disclosure system. China’s administrative information disclosure system should take the elimination of state obstacles, the state’s active disclosure, and the disclosure at the request of everyone as the basic form [11]. Tao, F. and others combined with specific examples in the transition period, analyzed the problems existing in the administrative disclosure system, such as the strong color of the rule of man, the lack of deep research on the subject system of administrative disclosure, the large discretion of the disclosure content, the long time to process the request, and the lack of relief means, and put forward some opinions on the development of China’s administrative information disclosure system [12].

3. Analysis of Key Technologies of Internet of Things Cloud Platform System

3.1. Analysis of Internet of Things Architecture and Message Transmission Technology

(1) Introduction to Internet of things architecture

Nowadays, the Internet of things has been slowly applied in different industries, such as home appliances and medical treatment. As shown in Figure 3, the system architecture of the Internet of things can generally be divided into three
layers: information perception layer, network transmission layer, and application service layer [13].

Among them, (1) the information sensing layer is generally the terminal device in the Internet of things, which obtains the data around the device through RFID, sensors, embedded systems, and other technologies, and connects the device to the network transmission layer and application service layer through ZigBee, Wi-Fi, and other wireless network technologies, so as to realize data transmission and sharing; (2) the network transmission layer generally provides network connection for the information perception layer and the application service layer. The system can choose to send data to the cloud platform quickly and reliably through wireless or wired communication technology, or two communication modes at the same time; (3) the application service layer is generally the service management center of the platform network. It can obtain the equipment data from the network transmission layer and process it, such as calculation, storage, and data mining, and then realize different user functions through the information or results obtained by processing.

(2) Analysis of message transmission protocol

When the terminal is integrated into the network through wireless communication technologies such as Wi-Fi and ZigBee, it needs to provide a stable and reliable message transmission mechanism for data interaction. Through relevant technical analysis, Matt protocol has the advantages of good timeliness, high transmission efficiency, and stable transmission mode in the scenario of Internet of things. Therefore, this paper uses Matt protocol as the communication protocol of message transmission, which is responsible for the rapid transmission of the obtained data to the cloud platform through a stable and reliable transmission mode. As shown in Figure 4, the publisher of the message can publish the message through the message server broker, and the subscriber of the message can also subscribe to the message through the message server. In this way, when the publisher publishes a message, the subscriber can receive the message pushed by Matt Broker at the first time, and both sides of message communication can play the role of publisher and subscriber [14].

In the process of transmitting messages, MATT needs to specify the Topic and Payload to be transmitted. Topic is the type of message to be transmitted. Subscribers obtain the message of the Topic by subscribing to the specified topic. Payload is the message content to be transmitted. The specific format of Matt message is shown in Figure 5, which is mainly composed of Fixed Header, Variable Header, and Payload. The fixed message header is generally used to mark the topic of the message, the size of the message, and other general information. The variable message header does not necessarily exist in all messages. It is mainly used to identify the data header of a specific message, while the message style is used to store the part of the content to be sent by the user.

The corresponding input $net_i$ of the hidden layer at the $i$ node:

$$net_i = \sum_{j=1}^{M} w_{ij}x_j + \theta_i.$$  \hspace{1cm} (1)

The corresponding output of the hidden layer at the $i$ node is $y_i$:

$$y_i = \varphi (net_i) = \varphi \left( \sum_{j=1}^{M} w_{ij}x_j + \theta_i \right).$$  \hspace{1cm} (2)

The corresponding input $net_k$ of the output layer at the $k$
node:

\[ \text{net}_k = \sum_{i=1}^{M} w_{ij}x_j + \theta_k = \sum_{i=1}^{L} w_{ik}p\left( \sum_{j=1}^{M} w_{ij}x_j + \theta_k \right) + \theta_k. \]  

(3)

The reverse transmission of the error starts from the output layer to calculate the output error value of each layer of neurons, and then relies on the error gradient descent method to correct the weights and thresholds of each layer, so that the final output of the adjusted network structure can be as close to the expected value as possible [15].

The quadratic error function corresponding to each sample \( p \) is \( E_p \):

\[ E_p = \frac{1}{2} \sum_{k=1}^{l} (T_k - O_k)^2. \]  

(4)

The sum function of the error function of the entire network for \( p \) training samples is:

\[ E = \frac{1}{2} \sum_{p=1}^{P} \sum_{k=1}^{l} (T_k^p - O_k^p)^2. \]  

(5)

3.2. Functional Requirements Analysis of IOT Cloud Platform System. A basic Internet of things cloud platform system should complete four functions: information acquisition, information transmission, information processing, and information efficiency. Among them, the information acquisition function refers to the collection of data information by the sensing device and the representation of its state, which can be realized by RFID, sensor, and embedded system; information transmission function refers to the information sending and receiving function between different modules in the whole system, and can be transmitted to a public platform for subsequent processing, so as to realize an efficient information network and ensure that the network is reliable; information processing function refers to the data processing process, through the subsequent processing and mining of the data and information transmitted from the terminal to the cloud platform, to obtain valuable information; information application function refers to the process of obtaining results from relevant information and feedback to adjust the running state of things. Therefore, to sum up, the cloud platform system implemented in this topic should be able to complete the following functions:

1. The terminal sensing device can collect, analyze, and upload the environment information in the building, and can monitor the instructions sent by the cloud system in real time, decode and analyze the instructions, and then complete the corresponding state conversion according to the instructions [16];

2. When the terminal sensing equipment in the building detects abnormal information, it can carry out fire early warning operation and circuit breaking operation, and report the alarm information to the cloud, and then the cloud will analyze, store, and push the message content to the user for subsequent processing

3. The cloud platform can provide a stable operation environment for the operation of applications. Various services in applications can be deployed in the cloud platform in a distributed architecture, and various application services can run stably, efficiently, and safely [17];

4. The cloud platform can provide a normal and stable connection for the terminal equipment, and can perform security verification, storage, forwarding, and other related operations on the information transmitted by the terminal sensing equipment in the building, so as to facilitate the subsequent processing of the system.

5. The cloud platform can provide a stable and reliable data warehouse to store the data uploaded by the terminal sensing device and the data of the user system for subsequent processing.

6. The system can store, analyze, and count the collected data, and display it on the front page of the system in the form of visualization, so as to provide the users with an interface for decision-making [18];

7. The user can remotely monitor the status information of the fire-fighting equipment in the building, and the system can provide the user with an interface for querying the detailed information, historical monitoring data, and data statistical results of the equipment.

8. The system needs to provide an interface for users to query, maintain, and manage the fire equipment information and system user information stored in the system, so that the current information maintained in the system is the latest information.

3.3. Overall Construction of Intelligent Supervision System Based on Internet of Things and Big Data

1. Overall framework

With the support of Internet of things technology and big data technology, we should build a product quality intelligent supervision system that meets the needs of the times and the level of technological development; at the same time, multiple subjects such as regulatory authorities, producers, consumers, and third parties should be included in the regulatory system to form a social network organization and regulatory joint force for supervising product quality. Based on this, this paper proposes a smart supervision system, which is as follows: relying on the Internet of things technology, the supervision departments, product manufacturers, consumers, and third parties are connected to form a common supervision network and communication channels; relying on big data technology, complete the development
and construction of risk early warning module, complaint reporting module, retrospective investigation module, and credit rating module.

(2) Overall framework

The construction objectives of the intelligent supervision system based on the Internet of things and big data are mainly as follows: first, promote the improvement of supervision efficiency [19]. According to the current situation, the traditional supervision mode is no longer applicable. We must establish a new product quality supervision mode, especially for the rapid development of online shopping, form an intelligent supervision system, and enhance the efficiency of product quality supervision. Second, reduce the actual cost of supervision. From the perspective of regulatory authorities, the funds they can use for product quality supervision are relatively limited, so it is very necessary to further reduce the supervision cost. The goal of the construction of intelligent supervision system is to integrate a variety of resources and form a joint supervision force on the basis of ensuring the supervision effect, so as to reduce the actual supervision cost. Third, promote the improvement of product quality. Relying on the construction of intelligent supervision system, strengthen the comprehensive and comprehensive supervision of product quality, achieve the effect of improving product quality, and form a social atmosphere of extensive participation and diversified governance.

(3) Functional structure

The architecture can be divided into five layers, namely, user layer, application system layer, business support layer, data support layer, and information technology facility layer. Among them, the user layer includes regulatory authorities, product manufacturers, consumers, and third parties; in the application system layer, it includes public supervision platform, government supervision platform, industry supervision platform, risk early warning platform, complaint reporting module, retrospective investigation module, and credit rating module; The business support layer includes big data technology and Internet of things technology, such as data mining, cloud computing, wireless sensors, and RFID; the data support layer includes basic database, business database, and platform database; the information technology facility layer includes 4G, 5G, communication technology network, Wi-Fi wireless network, IOT information network, and video monitoring equipment.

3.4. Specific Contents of Intelligent Supervision System Construction Based on Internet of Things and Big Data

(1) Horizontal construction of intelligent supervision system

(1) Regulatory authorities

The supervision department bears the responsibility of the promoter and organizer in the whole product quality supervision activities and the construction of intelligent supervision system, and is the leader of the construction of intelligent supervision system.

(2) Manufacturer

The producer (enterprise) is the producer and provider of products and bears the main responsibility in product quality. For product quality supervision, it is not only a constraint on the manufacturer, but also a protection for the manufacturer, which can effectively avoid the problem of malicious competition and maintain a good market environment.

(3) Consumers

Consumers are buyers and users of products, and product quality is closely related to their personal interests. Consumers’ feedback on product quality information is an important way for regulators to obtain product quality status. Incorporating it into the intelligent supervision system can obtain product quality information more accurately, comprehensively, and truly, and provide better support for the implementation of supervision.

(4) Third party

In this study, the third party mainly includes consumer associations, industry associations, professional inspection institutions, media, and other social forces. Bringing it into the command and supervision system can better safeguard the legitimate rights and interests of consumers, help the regulatory authorities accurately understand the product quality information, and improve the pertinence of the law enforcement of the regulatory authorities [20].

(2) Vertical construction of intelligent supervision system

(1) Risk early warning module

For risk early warning, it belongs to the starting point of product quality supervision. In product quality supervision, we must adhere to the supervision mode of “risk” oriented, implementation and prevention oriented. In the operation of the risk early warning module, consumers and third parties realize two-way interaction with the risk early warning module through the public supervision platform (transmitting information and receiving information feedback); The supervision department realizes two-way interaction through the government supervision module and the risk early warning module; the product manufacturer realizes two-way interaction with the risk early warning module through the industry supervision platform. After receiving the information, the risk early warning module relies on big data technology to realize the classification of low-risk enterprises, medium-risk enterprises, and high-risk enterprises, and feed back the relevant information to the regulatory authorities and product manufacturers.

(2) Complaint reporting module
4. Experimental Analysis

In this paper, alpha system and China referee document network are used as retrieval tools, with equal emphasis on authority and authenticity. By inputting the keywords of "administrative punishment" and Shandong, the administrative punishment cases judged from January 1, 2017, to December 31, 2019, are retrieved, and 235 cases are finally retrieved. Through screening, remove duplicate cases and retain 171 of them as analysis samples to ensure timeliness and representativeness of practical cases of grass-roots public security administrative punishment this year. The order of time is based on the judgment time.

4.1. Data Analysis

Table 1: List of regional classification and judgment results of administrative punishment cases.

| City  | Win | Lose | Other | Total | Proportion |
|-------|-----|------|-------|-------|------------|
| City A| 20  | 5    | 1     | 26    | 15.20%     |
| City B| 19  | 1    | 0     | 20    | 11.70%     |
| City C| 11  | 2    | 0     | 13    | 7.60%      |
| City D| 10  | 3    | 0     | 13    | 7.60%      |
| City E| 10  | 1    | 0     | 11    | 6.43%      |
| City F| 9   | 1    | 0     | 10    | 5.85%      |
| City G| 4   | 3    | 1     | 8     | 4.68%      |
| City H| 5   | 2    | 2     | 9     | 5.26%      |
| City I| 8   | 1    | 0     | 9     | 5.26%      |
| City K| 4   | 3    | 0     | 7     | 4.09%      |
| City L| 4   | 2    | 1     | 7     | 4.09%      |
| City M| 3   | 3    | 0     | 6     | 3.51%      |

(1) Overall analysis

Through the above sorting and statistical analysis of the data of previous years, the empirical investigation on the data related to public security administrative punishment from 2014 to 2017 is as follows (see the following chart):

(1) Regional analysis of cases

Among them, the incidence of administrative punishment cases is the highest in City C, with a total of 25 cases, accounting for 15.62%, followed by city B, with a total of 20 cases, accounting for 11.70%, followed by city A, with a total of 13 cases, accounting for 7.60%. The incidence of administrative punishment cases is the lowest in Pingdu, Gaomi, and Anqiu, with only one case, accounting for 0.58%. Then, according to the judgment results, the cases are roughly classified from the perspective of grass-roots public security. The defendant’s grass-roots public security is counted as losing if the punishment decision is revoked or confirmed to be illegal by the court. According to the statistics of the cases in which the plaintiff’s citizen’s claim is rejected by the court judgment, he is in favor. The ruling of rejecting the retrial application and rejecting the prosecution are classified as others, sorted, and summarized, and the following table is obtained (see Table 1). From the rough analysis in the table, we can see that the occurrence rate of grass-roots public security administrative punishment cases is different in different regions, and the concept of rule of law is more popular in economically developed areas. Citizens have high legal quality, and there are relatively few “hate litigation” and “fear litigation.” Administrative punishment litigation cases are mostly distributed in City C, City B, City A, and other places. Improving the level of regional economic development will appeal to the law against the non-standard behavior of administrative punishment to a large extent and force the grass-roots public security to standardize the law enforcement behavior of administrative punishment.
The cases in these three years are classified on the basis of cause of action by year. The frequency of fines is the highest, accounting for 37.26%, followed by detention, accounting for 35.74%, followed by fines and detention, accounting for 22.18%. The proportion of ordered suspension of production and business and suspension or revocation of licenses is the lowest, accounting for 0.58% (see Table 2). The administrative punishment applicable to the type of fine has a wide range of illegal acts. For the perpetrator who violates the administrative order, the fine, as a kind of monetary punishment, can leave some room while deterring. For the perpetrator, it is only an economic loss, which can be punished and admonished to promote the public to abide by the law and no longer break the law again. Detention as a restriction on citizens’ personal freedom to a certain extent, from the analysis results, the occurrence frequency is also high. The perpetrator violates the administrative order, but does not reach the degree of crime. It is reasonable, legal, and reasonable to use administrative detention to punish him.

### Table 2: Cause of action and proportion of administrative punishment cases.

| Particular year | Fine | Detention | Fines and detention | Order to stop production and business | Suspension or revocation of license |
|-----------------|------|-----------|---------------------|---------------------------------------|------------------------------------|
| 2014            | 13   | 18        | 14                  | 0                                     | 0                                  |
| 2015            | 21   | 22        | 16                  | 1                                     | 0                                  |
| 2016            | 22   | 17        | 7                   | 0                                     | 1                                  |
| 2017            | 10   | 6         | 3                   | 0                                     | 0                                  |
| **Total**       | **66** | **63**    | **40**              | **1**                                 | **1**                              |
| **Proportion**  | **37.26%** | **35.74%** | **22.18%**          | **0.58%**                             | **0.58%**                          |

### Table 3: List of levels and judgment results of administrative litigation cases brought by citizens for refusing to accept the decision of administrative punishment (unit: piece).

| Hierarchy Judgment result | First instance | Second instance |
|---------------------------|----------------|-----------------|
| Maintain the original decision | Reject the claim | Uphold the original judgment |
| 2014                      | 4              | 15              | 14              |
| 2015                      | 1              | 30              | 13              |
| 2016                      | 2              | 10              | 18              |
| 2017                      | 0              | 1               | 1               |
| **Total**                 | **7**          | **56**          | **46**          |
| **Proportion**            | **7.31%**      | **52.16%**      | **42.30%**      |

### Table 4: List of main types and proportion of losing cases (unit: piece).

| Project | Type of case    | Quantity | Proportion |
|---------|-----------------|----------|------------|
| 1       | Fine            | 19       | 45.34%     |
| 2       | Fines and detention | 9       | 22.16%     |
| 3       | Detention       | 6        | 15.13%     |
| 4       | No administrative penalty | 5       | 12.30%     |
| 5       | Confiscate      | 1        | 2.44%      |
| 6       | Revocation of license | 1       | 2.44%      |
| **Total** |                 | **41**   | **100.00%**|

### Table 5: List of levels and proportion of courts accepting lost cases (unit: piece).

| Court                      | Number of cases | Proportion |
|----------------------------|-----------------|------------|
| Grass-roots people’s courts| 27              | 64.95%     |
| Hierarchy                  |                 |            |
| Intermediate people’s court| 13              | 32.76%     |
| Higher people’s court      | 1               | 3.12%      |
| **Total**                  | **41**          | **100.00%**|

(2) Hierarchical distribution and analysis of judgment results

According to the court level and judgment results of the cases accepted by the plaintiff (citizen), there are 109 cases excluding the plaintiff’s application for retrial to the higher people’s court. It can be seen that in the cases of first instance, the proportion of the judgment rejecting the claim is the highest, accounting for 52.16%, and the judgment upholding the original decision is less, accounting for 7.31%; in the cases of second instance, the judgment results of the cases in which citizens lost the case were to maintain the original judgment, accounting for 42.30% (see Table 3). Based on the number of cases of first instance and second instance, it is found that there is a close difference between the two, which shows that the proportion of citizens who believe that their rights have been infringed and sue to the court is relatively similar to the proportion of continuing to appeal to the court of second instance against the results of first instance, that is, the situation of citizens who continue to appeal to the court of second instance after being rejected by the court of first instance or maintaining the original decision is increasing year by year. It means that citizens’ legal awareness is becoming stronger and stronger, and it is common to use legal weapons to defend their rights. This is a sign of further progress towards the era of the rule of the whole civil law[22].

From the results of the above analysis list, we can see that the judgments of 171 administrative punishment cases are systematically sorted and analyzed. Basically, all cases are...
litigation cases with citizens as the plaintiff and grass-roots public security as the defendant. Among them, 109 cases were won by the defendant and 41 cases were won by the plaintiff (citizen). It can be seen that the majority of administrative punishment cases in province B from 2017 to 2019 were won by grass-roots public security, that is, in administrative punishment cases, citizens generally have a high rate of losing. Therefore, next, based on the analysis of grass-roots public security losing cases, we will focus on the analysis and discussion of the defendant, that is, the losing cases of grass-roots public security in administrative punishment cases.

(2) Analysis of losing cases of grass-roots administrative punishment

(1) Case type analysis

According to the above statistical analysis, the 41 cases of losing the lawsuit of grass-roots public security administrative punishment are roughly divided into six types (see Table 4): detention, fine, fine and detention, no administrative punishment, confiscation, revocation of license and other types. In terms of the distribution of various administrative penalties, fines account for the largest proportion, about 45.34%; fine and detention, about 22.16%; detention ranked third, about 15.13%; fourthly, no administrative punishment, about 12.30%; confiscation and revocation of licenses are the same, both of which are 2.44%. Horizontal comparison of administrative punishment cases shows that among the 41 administrative punishment lawsuits, fines and detention fines are the most serious.

(2) Hierarchical analysis of accepting court

From the perspective of the level of court accepting cases reflected in the judgment documents, the judgments of grass-roots people’s courts account for 64.95%, the intermediate people’s courts account for 32.76%, and the higher people’s courts account for only 3.12% (see Table 5).

The grass-roots people’s courts generally accept the litigation actions brought by citizens against the grass-roots public security who have made administrative punishment, such as Ma XX accused Dongying Branch of Dongying Municipal Public Security Bureau, Tian XX and Linqing Municipal Public Security Bureau, the first instance case of administrative punishment of Linqing Municipal People’s government, and Wang X and Pingdu Municipal Public Security Bureau. The plaintiff refuses to accept the administrative penalty imposed by the defendant and brings a lawsuit to the people’s court; the administrative punishment cases accepted by the intermediate people’s court are generally appeals filed by the appellant against the administrative judgment made by the grass-roots court on the administrative punishment. For example, Cao XX and Niuquan police station of Laicheng branch of Laiwu Public Security Bureau have administrative litigation cases in the second instance of public security administrative punishment, Cheng XX and others have administrative litigation cases in the second instance of refusing to accept public security administrative penalty, and Fang XX and Qing District branch of Jinan Public Security Bureau have administrative litigation cases in the second instance of public security administrative punishment; the higher people’s court accepts the appeal brought by the appellant against the administrative judgment made by the intermediate court on administrative punishment, such as the administrative litigation case of second instance between Zhang XX and Jining Municipal People’s government.

According to the data analysis, administrative penalty litigation cases are generally accepted by the grass-roots people’s courts, the intermediate people’s courts mostly accept administrative penalty appeal cases, while the higher courts rarely directly accept administrative penalty litigation cases of first instance.

(3) Analysis of the reasons for losing the lawsuit

According to statistical induction and analysis, the judgment results of the court can be divided into four categories in the 41 cases of losing the administrative punishment of grass-roots public security. The judgment result with the largest proportion is: the judgment procedure is illegal and the defendant’s administrative punishment is revoked, accounting for 32.16%. The second is that the facts are unclear and the evidence is insufficient, and the defendant’s administrative punishment is revoked, accounting for 28.52%. Then, the procedure is illegal, and the defendant’s administrative punishment decision is confirmed to be illegal [23], accounting for 25.34%. Finally, the judgment result of the application of law is wrong, and the defendant’s administrative punishment is revoked, accounting for 12.13% (Table 6).
The purpose of empirical research on administrative penalty litigation is not to summarize the data, but to find the deeper problems that affect the judgment results and exist in the subjects of all parties to the litigation from the above data. Through the general summary and analysis of the judgment results of administrative punishment litigation cases, it can be seen that the problem of procedural illegality is the problem that the grass-roots public security administrative law enforcement personnel who make administrative punishment pay the least attention to; secondly, the administrative law enforcement personnel have great discretion when making administrative punishment, and impose administrative punishment when the facts are not investigated clearly and the evidence is not adopted completely; thirdly, the professional quality of administrative law enforcement personnel is not enough, and they do not perform their duties in strict accordance with the administrative principle of "no authorization without law."

5. Conclusion

According to the fact that blockchain is a cutting-edge technology in the way of data utilization and preservation and another practical feature from the perspective of big data, this paper proposes to use blockchain technology to prevent the tampering of law enforcement information and realize the real-time sharing of data through the technical characteristics of distributed storage. Then, according to the fact that artificial intelligence is a computer intelligent nervous system based on massive data and the identification and characteristics of big data, it is proposed to strengthen the intelligent analysis, research, and judgment of big data, strengthen the comparison between case file information and on-site law enforcement data, and strengthen the practical effect of administrative law enforcement supervision. According to the characteristics that big data analysis is relevance analysis and fuzziness analysis, it is proposed to strengthen the connection between big data supervision platform and other supervision methods, strengthen investigation and verification, make clues truly become cases, and strive to correct problems such as lax and unfair law enforcement by administrative organs. With the deepening of the construction process of rule of law, it is a wise move to protect the legitimate rights and interests of citizens to find and explore the problems in administrative punishment, and then improve them. This paper adheres to the problem orientation, takes the analysis and summary of the practical cases of administrative punishment as the starting point, deeply analyzes the problems existing in administrative punishment through empirical analysis and comparative research, lists the prominent problems existing in administrative punishment from the aspects of entity, procedure, evidence, and judgment, and puts forward corresponding improvement suggestions.

Of course, although the research conclusion of this paper is put forward on the basis of the analysis of practical problems, it is also drawn under the framework of big data theory. There must be a certain gap from the real landing, both in time and conditions. However, with the rapid development of science and technology and big data, this goal is worth looking forward to and striving for, in order to continuously deepen the construction of China under the rule of law and promote the modernization of national governance capacity and governance system.

Data Availability

No data were used to support this study.

Conflicts of Interest

The author declares no competing interests.

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