Research on Risk Prevention System of Judicial Administration Based on Big Data Analysis

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Abstract. With the further development of the Internet, big data and deep data mining technology is quietly changing all aspects of social life with its unique functional characteristics. However, affected by many factors at home and abroad, China's judicial administration is facing serious internal and external crisis. There are many potential risks in the process of judicial administration. If we can rely on modern science and technology to establish an effective risk prevention system, it will effectively protect the judicial administration according to law. Among various emerging technical means, big data technology provides an effective way for the establishment of risk prevention system with its universality, accuracy and predictability. Based on big data technology, this paper builds a risk prevention system in the field of judicial administration. Through the outstanding achievements of the government in risk prevention in recent years, the results show that good risk prevention effect has been achieved in the aspects of administrative efficiency, anti-corruption, public opinion guidance and so on.

Keywords: Big Data, Judicial Administration, Predictability, Risk Prevention

1. Introduction

Human society has entered a new era of rapid technological changes. Looking at the continuous iterative updating of science and technology, as well as the earth-shaking changes brought about in all aspects of social life[1]. The state attaches great importance to the development of information technology based on new technology to an unprecedented extent[2]. The important conclusion of "no information, no modernization" was highlighted at the first meeting of the central leading group on network security and informatization[3].

Precision services such as advertising recommendation based on personalized advertising ID show that the world, we live in is shrouded in big data[4]. The unique data collection and analysis
The capabilities of big data are amazing. The era of "big data" has arrived. In the field of judicial administration, the emergence of big data analysis technology will provide a new tool for solving practical problems\(^5\). In order to effectively follow up the technological progress of the new era, the state has constantly introduced the promotion of big data and other technologies in the field of judicial administration and innovative application. It is of great significance to grasp the pulse of the era of science and technology and combine "big data" with judicial administration to promote the purity construction of leading administrative organizations\(^6\).

Since the 18th National Congress of the Communist Party of China, corruption has been strictly controlled by the state, and many serious corruption incidents have surfaced, which shows that there are serious internal risks in the field of Judicial Administration\(^7\). On the other hand, with the continuous development of communication technology, the channels of information exchange and dissemination are constantly enriched, which has caused a series of information problems. Among them, the network public opinion has seriously affected the normal progress of judicial administration, and caused certain damage to the stable state of social life\(^8\). This also shows that the judicial administration also faces serious external risks. Then, with the help of the universality, accuracy and predictability of big data, we can provide a new risk prevention and early warning tool for judicial administration construction, so as to find and solve relevant problems in time\(^9-10\).

2. Big Data Analysis and Judicial Administration

2.1. Big Data Analysis

As the word implies, "big data analysis" means that the scale of data is so large that it is impossible to collect, analyze and sort out the relevant information of the target object in an effective time through traditional tools, methods and means. Big data has the characteristics of large amount of data, various types of data, strong real-time requirements, and great value. Big data analysis is actually the data mining of more extensive data. The purpose of big data technology is to find the subject relationship with certain rules through the analysis of the target object database. It is a significant feature of big data analysis to find reliable and credible link relationship through digital information analysis, so as to predict the related behaviors of the subjects studied.

The basic principle of big data prediction can be described by Bayesian formula:

\[
P(B | A) = \frac{P(AB)}{P(A)} \quad (1)
\]

\[
P(A | B) = P(B | A)P(A)P(B) \quad (2)
\]

The more events that support an attribute, the more likely it is to hold. For a certain formula, the estimated value of subjective judgment is made first, and then the correct result is predicted according to the objective facts.

2.2. Judicial Administration

Judicial administration refers to the activities of the state special organs to implement state management on the administrative affairs in the judicial fields such as prison management,
reeducation through labor, legal publicity, lawyers, notarization, people's mediation, legal education, legal research, and governance according to law.

Judicial administration is planning, organizing, directing and communicating according to certain procedures. It includes the administrative activities of public security organs, national security organs, judicial administrative organs, prisons, and reeducation through labor, notarization, lawyers, mediation and other organizations.

Judicial administration is the administrative activity of judicial administrative organs, which is the general designation of various safeguards and services around judicial activities. Judicial administration can be divided into broad sense and narrow sense.

Judicial administration in a broad sense refers to the state's management of judicial organizations and judicial activities.

Judicial administration in a narrow sense refers to the management of the judicial process of courts and procuratorates. It includes two levels: one is the judicial management of the external system; the other is the internal self-management of the court and procuratorate.

3. Investigation on Judicial Administration Risk Prevention System

3.1. Background of Investigation

The normal operation of judicial administrative function is a necessary condition for the stable development of a country. In order to ensure the judicial administration in accordance with the law and prevent the occurrence of corruption has been the focus of the work of the party and the government. Under the leadership of general secretary Xi Jinping, the era of China's most powerful anti-corruption efforts was drawn up. However, affected by the domestic and foreign turbulent situation, judicial administration is also facing external risk.

3.2. Survey Design

The service object of judicial administration is all the people in the society. The shortcomings in the process of judicial administration can be reflected through the practical evaluation of the people. These deficiencies are the risk points of judicial administration. Through questionnaires, random visits, anonymous letters and other forms, the public's evaluation of judicial administration is widely collected, so as to analyze the risk situation at this stage.

3.3. Data Supplement

According to the report card of anti-corruption work published by the Communist Party of China in 2019, and combined with the statistical data of anti-corruption work in previous years, the analysis is carried out.

4. Risk Prevention in the Field of Judicial Administration

4.1. Internal Risk of Judicial Administration
The judicial administrative department is the executive organ of national laws and regulations. It is a necessary condition to prevent internal violations of law and discipline to ensure fairness and justice. The stability of the leadership of national political power lies in ensuring the purity of the leading organization, and strict governance of corruption is the key point of work. The following figure 1 shows the report card of national governance of corruption from 2017 to 2019.

![Figure 1. 2017-2019 Anti-Corruption Transcripts.](image)

From the data point of view, the report card of anti-corruption in 2019 is eye-catching. The number of officials investigated and dealt with has shown a growing trend in three years, and the growth is growing. This not only reflects that the current national government's anti-corruption efforts are still not relaxed, the anti-corruption work is still in accordance with the established goals, and the high-pressure anti-corruption situation is still maintained, but also shows that the corruption situation in China's political system is still very serious. After this investigation, the number of "key minority" cadres, such as the cadres under the central and provincial management, remained at a high level and showed an increasing trend. Throughout the whole process of anti-corruption in 2019, there are three main characteristics: first, accurate anti-corruption; second, strengthening the treatment of both symptoms and root causes; third, deepening grassroots anti-corruption. According to the data, the anti-corruption effect is obvious, but it also shows that there are not a few groups involved in corruption, and the internal risk of judicial administration is still very serious. Therefore, from the internal analysis of judicial administration, the biggest risk lies in the investigation and prevention of corruption of internal officials.

The key to the governance of corruption is to find the key point of corruption. The reason why corruption occurs is because there is a blind area in the use of power, which can’t play an effective and transparent supervision on the specific implementation process of power. The key to the governance of power corruption lies in the establishment of transparent and open supervision system. As shown in Figure 2, the stratum division of the people involved in corruption is further revealed.
Figure 2. Proportion of Corrupt Class in 2017-2019.

It can be seen from the chart of the stratum division of the corrupt personnel that the phenomenon of corruption has appeared in every important stratum. Only a small number of them are distributed in the central management cadres, the party at the central level, state organs, state-owned enterprises and financial institutions. The vast majority of corruption is concentrated in provincial cadres. This also reflects that most of the corruption of power occurs in the provincial units close to the people's life and far away from the central management. This shows that the management system of the central government is effective, but the implementation degree and binding force of the system at all levels are not the same.

4.2. External Risks of Judicial Administration

All things can be connected with each other, with the extensive promotion of the Internet. People's access to information has also undergone a revolutionary change. The convenient transmission of information does provide convenience for communication, but at the same time, the power of language also becomes powerful with the development of communication. Sometimes, the spread of false news leads to vicious social network public opinion, which has a serious adverse impact on the normal operation of judicial administration. It has greatly harmed the stability of the country and society. This also shows that it is necessary to establish a supervision and early warning system on network public opinion, and take timely measures to deal with public opinion in the early stage of development, so as to avoid further deterioration.

Table 1. Deficiency of Judicial Administration.

| Deficiency of Judicial Administration | The functions of departments are various and disorderly. |
|--------------------------------------|--------------------------------------------------------|
|                                      | Various departments are interwoven.                     |
|                                      | The level involved is too broad.                        |

It can be seen from table 1 that the characteristics of "complex functions, intertwined lines and wide layers" make the judicial administration system's ability to respond to network public opinion is still very weak. Throughout the current development trend of network public opinion involving
justice, a series of public opinion crisis events, such as the prison break case in Hohhot No.2 prison and the tanghuilao teaching case in Yongzhou, Hunan Province, all show the great influence of network public opinion. It also sounded the alarm of public opinion monitoring. With the rapid and wide spread of false information through the network, if there is no certain regulatory system for screening and filtering, it may lead to serious network information accidents, and even have a serious impact on real life. In particular, the illegal elements distort the facts, attack the leading organizations and the government with false information and incite the public, which has caused serious harm to the national judicial administration.

4.3. Internal Risk Prevention Based on Big Data Analysis

Based on the above analysis of internal risk. The key point of prevention is that there is a blind area in the operation process of administrative power that cannot be touched by the supervision perspective. Then, based on the technical characteristics and advantages of big data analysis, we can create a special administrative data platform for judicial administration. So many applications of information technology in the field of administration of justice have been broken. First of all, through the digital judicial administration information service platform, the traditional judicial administration system is revised. With the characteristics of convenient network information transmission, a complete government big data analysis system is established while building and optimizing intelligent judicial administration. The characteristics of the network are used to realize the transformation of judicial administration from offline to online, thus providing an interface for the information collection source of big data analysis system.

Through data mining and in-depth analysis of the target database, give full play to the technical characteristics of big data analysis. This paper analyzes the existing anti-corruption cases, finds out their common rules and applies them to the early warning of potential risks. All human activities must have external reaction forms and common laws. With the continuous accumulation of experience in the work of investigating and dealing with corruption personnel in China, more and more effective information is provided for big data analysis system. The inherent law of corruption behavior obtained by mining this information will provide powerful assistance for the future prevention and early warning work.

4.4. External Risk Prevention Based on Big Data Analysis

Due to the huge amount of network information, it is almost impossible to rely on manual collection and query. We must use the automatic network public opinion monitoring system to automatically collect and monitor network public opinion, and change the passive response to active guidance. Different from the general Internet search engines, the data of the public opinion monitoring system is through directional collection (breadth and depth), real-time update (such as the number of hits, replies, reprints), local archiving (cleaning and filtering, automatic classification, similarity sorting), and has the functions of trend analysis (analysis and mining) and automatic early warning. Internet search engines can’t meet the needs of public opinion monitoring in terms of comprehensiveness and timeliness.

In the field of big data application, the intersection of business intelligence and big data, the application of data mining technology to find valuable rules and patterns from huge data, realizes the
analysis of research objects from point to line. In addition, there is the birth of large-scale data
distributed processing technology. It makes the prediction mechanism of big data analysis technology
more perfect and information processing more accurate. It is enough to shoulder the burden of
monitoring and early warning mechanism of network public opinion in judicial administration system.
Through the big data analysis technology, the network public opinion can be given early warning in
time. Through the qualitative and quantitative analysis of the network public opinion, the public
opinion risk assessment mechanism should be established; the guidance ability of the network public
opinion must be improved, the response and disposal mechanism should be established, and the
network public opinion can be controlled in time. So as to create a good social external environment
for the smooth progress of judicial administration.

5. Conclusion

Through the mass investigation and analysis of the internal and external risks of judicial
administration, this paper focuses on the risks of internal corruption and external social network
public opinion in the field of judicial administration. Based on the data universality, accuracy and
predictability of big data analysis technology, a big data analysis system of corruption risk monitoring
and early warning of judicial administration and network public opinion monitoring and early
warning is established. So as to create a good internal and external environment for judicial
administration. In recent years, the preliminary application of big data analysis in the field of judicial
administration shows that it is worth further promoting the construction of risk prevention and early
warning system of big data analysis technology.

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