

## Research on the Management and Maintenance of Intellectual Property Infringement in Big Data Environment

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### Abstract

*Big data has intangible physical characteristics and non-structural characteristics, so it can't be used routinely. However, through human wisdom and labor, after analyzing and calculating big data, we can get the results with similar characteristics of traditional intellectual property objects. As a platform for gathering and transforming scientific and technological innovation achievements, intellectual property trading platform has also become an important factor to guarantee the construction of an innovative country in China. Under this background, it is very necessary to manage and maintain the infringement of intellectual property rights. Therefore, the further maintenance and management of our country's current intellectual property rights by means of big data and big data-related technologies is one of the most practical aspects in the process of our country's rapid development of big data technology.*

**Keywords:** Big data, Intellectual property rights, Infringement, Management, Maintenance

### I . Introduction

Big data has entered every aspect of social life, showing a geometric growth trend, constituting a powerful era of data resources, including a series of activities in news dissemination. Although big data technology is constantly merging with intellectual property rights, the application time of big data technology in intellectual property industry is relatively short. The application of big data in intellectual property industry is increasing, and big data can protect intellectual property to some extent. People endow the intellectual property system with distinct technological characteristics of the times, and call it “network intellectual property” [1]. Therefore, the intangibility of intellectual property objects and the virtuality of cyberspace have a natural fit, which greatly promotes the development of intellectual property rights [2].

When intellectual property is not supported by big data technology, its information and data are fragmented and independent without connection, while big data technology can connect these data and information, so that all people can share information about intellectual property rights, thereby better protecting intellectual property rights. Although the integration of big data and intellectual property has made some progress, there are still some challenges. It is necessary to continue to study the management and maintenance of intellectual property infringement under the big data environment.

### II . The Value of Applying Big Data to the Management and Maintenance of Intellectual Property Infringement

Traditional detection method relies on manual retrieval, which is difficult to detect, time-consuming and inefficient because of less data comparison. However, big data technology can quickly detect the similarity of intellectual property based on a large amount of data in the intellectual property industry, which provides convenience for people, reduces work difficulty and improves work efficiency [3]. At present, the application of big data in the management and protection of intellectual property rights in China mainly has the following specific values:

(1) Collaborative and shared management

Intellectual property management institutions integrate data collaborative and shared management, which can integrate data at multiple levels and deepen the timeliness of intellectual property big data management.

(2) Upgrade of management level

The application of big data is an upgrade of the management level of the relevant national intellectual property management departments, and in this upgrade, the corresponding law enforcement standards and even the relevant national laws and regulations are unified. In this way, the administrative department of intellectual property rights can reasonably analyze and crack down on infringement, thus fundamentally preventing the occurrence of cases of infringement of intellectual property rights.

(3) Effective supervision

Through the use of Internet technology, we can supervise and strengthen the online tort and effectively manage it according to law. For example, we will unite some well-known video broadcasting websites, e-commerce platforms, online literature platforms, online forums, Weibo, blogs and other areas, and rely on big data technology to comprehensively carry out large-scale sanctions against intellectual property rights violations. In this way, the phenomenon of network infringement can be well managed, and the offenders can be punished to form a certain extent.

(4) Treatment of intellectual property infringement

Big data technology realizes the connection between fragmented and independent intellectual property rights, and realizes a new mode of intellectual property industry with information sharing and exchange. This can effectively reduce the resource repetition rate and effectively solve the defense ability of intellectual property rights conflict.

### **III . Dilemma of Management and Maintenance of Intellectual Property Infringement in Big Data Environment**

#### ***A. Lack of Intellectual Property Law***

Due to the virtual nature of the Internet, which has the characteristics of rapid spread and wide range, information may be widely copied and distributed, which makes the intellectual property infringement of the Internet cultural industry different from the traditional cultural industry. At present, our intellectual property law does not fully meet the needs of reality, and there are many legislative gaps. The lagging intellectual property legal protection can not only provide a good legal environment for the development of domestic cultural industries, but also hinder the introduction and absorption of advanced foreign technology, capital and management experience by cultural industries.

Therefore, it should be recognized that intellectual property protection legislation plays an important role in stimulating mechanism and promoting industrial development. The lack of relevant laws is hindering and restricting the development of cultural industries. It is urgent to reconstruct the intellectual property protection system and change the current situation that hinders or does not adapt to the development of cultural industries.

#### ***B. Backward Technical Supervision***

Data analysis, control, storage, production and other work activities are progressing very slowly; The previous database system can store very small data capacity and process very little, which often leads to data loss, slow data processing speed and high difficulty in data collation [4]. Therefore, there are only a handful of data processing equipment independently researched and released in China, and the speed and quantity of research and release of

data analysis software lags far behind that of some western developed countries. The lack of big data management and control technology independently researched and issued in China is the main reason for the slow progress of intellectual property big data.

### ***C. Lack of Patent Protection***

It may be more difficult to judge patent infringement under the background of big data. For example, if all the relevant information disclosed by an enterprise is analyzed according to the specific operation method of big data, it is possible to obtain the possible research and development direction and specific technical details of the enterprise, and then carry out surprise research and development, and then apply for patents first.

In addition, using big data for analysis can also be used for data integration, and then a brand-new patented technology similar to the original patent may be formed, so that other enterprises may bypass the original patented technology in this way, which is also a huge loss for the original enterprise, and it will become quite difficult to define this infringement in practice.

### ***D. Subjectivity of Manual Review Leads to Insufficient Credibility***

If the management and maintenance of intellectual property infringement in the big data environment can't make full use of the capabilities and functions of big data technology, it will be difficult to delete useless and wrong data, and automatic analysis can't be carried out, which will enhance the subjective role of the staff and interfere with the fairness of the examination results. At the same time, related practitioners or enterprises will seriously question the transparency of the work of the intellectual property management department, which will reduce the credibility of the management department, affect the willingness to apply for intellectual property rights, and lead to an increase in the administrative case rate of intellectual property rights.

## **IV. Management and Maintenance of Intellectual Property Infringement**

### ***A. Improve Big Data Technology and Build an Information Platform***

China's big data technology level is low, and in the process of intellectual property retrieval, it still needs to rely on labor, but cannot rely entirely on big data technology. Therefore, it is necessary to study the processing tools used in the application of big data technology and improve the big data technology [5-6]. In this way, we can completely rely on big data in the process of intellectual property detection, and improve the accuracy and objectivity of detection results. Improving the data processing ability of big data technology can strengthen the connection between intellectual property data and information, prevent infringement events more effectively, and protect intellectual property rights and innovation ability better.

Under the background of "internet plus", the construction of intellectual property trading platform should pay attention to building the overall function of the platform and strengthen the "one-stop" solution of intellectual property operation under the guidance of demand; Coordinate the connection between intellectual property trading platform and other platforms, and strengthen the external linkage construction; At the same time, the internal business module of intellectual property operation platform is designed, emphasizing the compatibility of different subjects' interests in the platform.

The intellectual property trading platform undertakes or gathers many specific business services. According to different operation modes, the intellectual property trading platform has at least the following five core business modules: The first is the implementation module of intellectual property industrialization; The second is the intellectual property trade circulation module; The third is the intellectual property trade circulation module; The

fourth is the application module of intellectual property combination; Fifth, the intellectual property structured litigation module. See figure 1.



*Fig.1 Five business modules of intellectual property trading platform*

Among them, the implementation module of intellectual property industrialization takes the concretization and industrialization of scientific and technological achievements as the goal, and carries out in-depth research and development or practical application through its own implementation, transfer to others or joint implementation with others [7]. The intellectual property structured litigation module relies on the professional legal services of legal service institutions or legal departments of enterprises and institutions, and carries out intellectual property defensive or offensive rights protection through legal combination strategies, so as to obtain corresponding economic benefits.

Paying attention to the creation of online platform is the information transformation of the traditional trading mode in the “internet plus” era, providing users with one-stop full-process services in all aspects of intellectual property transactions. The construction of online platform is mainly to build “one network”, which is based on professional and comprehensive platform positioning. The construction of online platform is mainly to carry out business-oriented service organization integration and business modular setting management [8]. Provide purchase information and demand information on patents, trademarks and copyrights in the form of wisdom shopping mall. See figure 2 for the online transaction process of intellectual property rights.



*Fig.2 Online trading process of intellectual property rights*

China has built some information platforms, which can collect, collate and analyze the data and information in the intellectual property industry with the help of big data technology. However, due to the short development time and limited technology, the information searched by these information platforms is not comprehensive enough, and most information platforms can only search for domestic information, which has certain limitations. Therefore, we need to build an information platform and improve its technical support, so that people can search for more and more comprehensive data and information in the search process.

### B. Improve Intellectual Property Big Data Institutions and Systems

Under the background of big data, the weak understanding of big data of intellectual property mechanism is the main reason for the loss of intellectual property management and control work [9]. Therefore, China's intellectual property mechanism should strengthen the awareness of rooting in big data, and demand that data participate in the action inside and outside the organization by thinking, and set up special intellectual property institutions under the application of big data to provide enterprises and society with a safer, more reliable, two-way interactive and unified intellectual property application center. Figure 3 shows the overall structure of the intellectual property search system.



Fig.3 General structure of intellectual property search system

The underlying system uses Hadoop as the open source implementation of MapReduce computing framework, and uses Hadoop distributed file system and HBase to store data, which includes original data, generated similar record pairs, similar subgraphs and sampled results. We use MapReduce framework to deal with different entity recognition tasks, and each MR task is divided into several different nodes to perform Map and Reduce tasks. The application layer of the system includes three core functional components and three modules: data analysis and extraction, entity query and analysis, and MapReduce task scheduling. At the same time, it provides two user interaction interfaces, Web and Client, and MapReduce task extension interface. The core function is the similar connection engine component, which uses MapReduce computing framework to find record pairs that meet the similarity threshold from a group of data sources in distributed parallel computing, thus solving the performance bottleneck of similar connection computing in large data sets.

China's intellectual property big data management and control work is operated and controlled by different institutions alone, and the management and control work between institutions is lack of contact, and the internal structure of the system is chaotic, which makes it difficult to achieve an efficient, coordinated and unified management of intellectual property big data management and control organization. The establishment of a unified and joint intellectual property big data management and control platform, the integration of intellectual property data resources, and the improvement of laws and regulations are all tasks that need to be improved urgently in our national intellectual property management and control work.

### C. Establish a Big Data Sharing System

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One of the major problems faced by China's big data intellectual property application is that a unified big data platform has not been established, which leads to the fact that intellectual property practitioners need to switch between multiple systems, resulting in low work efficiency. The management and maintenance of intellectual property infringement under big data environment cannot be done without big data awareness. It is necessary to fully understand big data and firmly establish big data awareness, so as to influence and lead enterprises and individuals to participate in the application of big data.

Intellectual property has monopoly and represents private rights; data sharing emphasizes openness and sharing, representing the interests of the majority, which is a kind of public rights, and there is inevitably a conflict of interests between the two [10]. In order to defend private rights, data producers are unwilling to share and disclose data, or based on other considerations, they only selectively and publicly share non-important data. Intellectual property rights are monopolistic and represent private rights; data sharing emphasizes openness and sharing, representing the interests of the majority, which is a kind of public rights, and there is inevitably a conflict of interests between them. In order to defend private rights, data producers are unwilling to share and disclose data, or based on other considerations, they only selectively and publicly share non-important data.

At present, some e-commerce giants, search companies and trademark, patent and copyright agencies have used their own businesses to collect and organize relevant search databases. The new intellectual property law system should clearly establish a joint or unified big data management platform to improve and repair the existing system loopholes and gaps.

#### ***D. Improve Laws, Regulations and Rules on Intellectual Property Rights***

In the era of big data, the laws and regulations on intellectual property should be adjusted and modified accordingly. The first thing is to confirm whether the patents obtained through big data integration are protected by intellectual property rights. Because this patent may infringe on the rights of the original patentee, once it is protected, what kind of protection should be given to the rights of the original patentee? At the same time, for the recombined products, the legal risks have been avoided, but how to deal with the losses caused to the original patentee needs to be improved.

By perfecting relevant laws and judicial interpretations, not only can the rights of the original patentee be clearly defined and effectively protected, but also the status of derivatives in the era of "big data" can be established and unnecessary troubles can be avoided.

### **V. Conclusion**

With the rapid development of information technology, the management and maintenance of intellectual property infringement under the big data environment is unstoppable, and the development of intellectual property is faced with both opportunities and challenges. The establishment of a big data platform for the management and maintenance of intellectual property infringement can smooth the public's access to intellectual property, shorten the timeliness of public access to intellectual property and improve the efficiency of public access to intellectual property. Applying big data technology, supporting the maintenance and management system of related intellectual property big data, and promoting the innovation and development of intellectual property rights. At the same time, we can learn from the achievements of intellectual property data management in developed countries and use them in the application of big data technology in China, so as to ensure that the application of big data intellectual property can play an effective role and achievements.

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## References

- [1] Peng Yanyuan, Zhou Diandian. The Research on the Construction of Credit System of Intellectual Property Practitioners in Big Data Background[J]. special zone economy, 2019, 000(001):111-115.
- [2] T Lindner, P Mandl, N Bauer, et al. Detection of Duplicates in Big Data in the Use Case of Digital Music Usage[J]. HMD Praxis der Wirtschaftsinformatik, 2018, 55(3):581-600.
- [3] Tessensohn J A. Japan Confers Unfair Competition Protection on 'Big Data'[J]. European intellectual property review, 2020, 42(2):134-136.
- [4] Liu C H, Chen W H. The Study of Using Big Data Analysis to Detecting APT Attack[J]. Journal of Computer Science, 2019, 30(1):206-222.
- [5] Xiao M. Is Big Data a Big Dilemma or a Big Opportunity in China? Intellectual Property Protection in the Era of Big Data[J]. China and WTO Review, 2018, 4(1):67-92.
- [6] Bellotti F, Osman N, Arnold E H, et al. Managing Big Data for Addressing Research Questions in a Collaborative Project on Automated Driving Impact Assessment[J]. Sensors, 2020, 20(23):6773.
- [7] Wei H, Guan S. Path and Mechanism of Blockchain Embedded in Innovation Management of Cultural and Creative Industrial Park[J]. Discrete Dynamics in Nature and Society, 2021, 2021(3):1-12.
- [8] SaukH I, Vikarchuk O. Creativity in management and creative management: meta-analysis[J]. Marketing and Management of Innovations, 2021(1):65-80.
- [9] Ryan M. Ethics of Using AI and Big Data in Agriculture: The Case of a Large Agriculture Multinational[J]. The ORBIT Journal, 2019, 2( 2):1-27.
- [10] Oguamanam C. Indigenous Peoples, Data Sovereignty, and Self-Determination: Current Realities and Imperatives[J]. The African Journal of Information and Communication, 2020, 26(26):1-20.